



Teacher Education in India



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PREFACE

India is well known for its ancient Education. NALANDA, that is, NA- ALAND- DADATI-ITI (Which does not provide less- VIPULA), TAKSHSHILA, that is, TRKSHILA, and other Ancient Universities , namely, VIKRAMSHILA, VALLABHI, ODANTPURI, JAGDALPUR, KASHI, KASHMIR, MITHILA, NADIA, DHARA, KANYAKUBJ, have been the Centers of Learning. Nalanda University was a center of learning for knowledge seekers. They not only studied here, but, transcreated the knowledge. Situated at 55 miles south of Patna (Patliputra) and seven miles north of Rajgarh, the Ancient Nalanda has its remains (Khandhar). The Foundation Stone of Nalanda University was laid by the Gupt Samrat Kumar Gupt-!. Students from Middle Asia, China, Tibbat, Korea, used to come to seek admission here. The Entrance Examination was very Tough. The candidates had to dialogue with the Dwarpal (Dwarpandit) first. On the basis of successful dialogue, this Gatekeeper would permit only 1 to 2 candidates out of 10 to enter. It was a honour to get admitted and being the Student of Nalanda. These students were respected through out the country. Only gifted Students could get admission in the Nalanda University. Even then the strength of Nalanda was greater than that of any other University in the world. During the visit of Itsingh (675 AD), the Student Strength of Nalanda was 3000, whereas, during the visit of Shavan- Chang it went up to 10,000. There were students from Tibbat, Korea, Tushar, and Central Asia also, in this University. Yuvan- Chang, Itsingh, Thanmi, Havenchiu, Tau-Hi-Havi-Niah, Aryavaman have been some of the well known Students of this University. KULPATI SHEELABHADRA (635 AD), during the visit of YUVANG- CHANG was found to have assimilated the Sutras and Shashtras available at that time. Yuvan- Chang has made a mention of the Intelligencia at that time, DHRAMPAL earlier VC; expert on the Teaching of Buddha, CHANDRAPAL, Highly Gifted and Popular GUNMATI & SATHRMATI, LOGICIAN on his Subject PRABHAMITRA, COMMUNICASTION Expert JINMITRA and IDEAL Character GYANCHANDRA. The Teaching Methods used were Oral, Explanation of Books, Lecture, SHASHTRARTH and DIALOGUE. In addition to these many other approaches, namely, BHIKSHATAN, SHRAM, PARISHAD, GOSTHI CHARAN and AGARSHISHA approaches were used. There was a grand Library to take care of the studies of 1500 Teachers and 10,000 Students. The three buildings, namely, RATANSAGAR, RASTNODHI, and RATANRANJAK constituted the Library. VIDYA PARISHAD was taking care of the Academics of the University, whereas, Finance & Administration were taken care of by another Committee. The University was mainly meant for BHIKSHU Students. There was no fees. Even the Boarding and Lodging were also borne by the University. The New Education Policy NEP(2020) has the vision & mission to Nurture

the Legacies and trans-create the Ancient SANATAN SANSKRUTI, which is NIT NOOTAN & CHIR PURATAN!

The present volume contains Education in Search of Identity, Educational Research & Sustainable Development, Research Scenario of Teacher Education in India, Researching Pioneer Competencies in India, Teacher Education Scenario in India, Taxonomy of Educational Skills, Issues & Concerns of Teacher Education, Teacher in the Digital Age, Basic Tenets of Qualitative Research, Innovations in Teacher Education, Methodological Issues of Research in Teacher Education, NCTE Structure & Functions, ICT Aided Constructivist Learning Approach, Innovative Practices in Teacher Education, TQM of Teacher Education, Science Education for holistic Development of Teachers, Synthesizing Research, Teacher Education in India 2015+, 21st Century Teachers, Learner Driven Pedagogy, National Education Day, Educational Technology in India, Scaling Educational Skills, Our Journey of Indian Teacher Education & Indian Teacher Education: Whither To!

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SNO	CONTENT	PNO
1	Outer Cover Page	1
2	Preface	2-3
4	Table of Contents	4
5	Education in Search of Identity	5-24
6	Educational Research & Sustainable Development	25-42
7	Research Scenario of Teacher Education in India	43-85
8	Researching Pioneer Competencies in India	86-100
9	Scenario of Teacher Education in India	101-146
10	Taxonomy of Educational Skills	147-187
11	Teacher Education in India: Issues & Concerns	188-205
12	Teacher in the Digital Age	206-232
13	Basic Tenets of Qualitative Research	233-246
14	Innovations in Teacher Education	247-263
15	Methodological Issues of Research in Teacher Education	264-273
16	NCTE: Structure & Functions	274-289
17	ICT Aided Constructivist Learning Approach	290-307
18	Innovative Practices in Teacher Education	308-330
19	TQM of Teacher Education	331-355
20	Science Education for Wholistic Development of Teachers	356-376
21	Synthesizing Research	377-389
22	Teacher Education in India 2015+	390-401
23	21 st Century Teachers	402-408
24	Scope of SCOPE in Indian Higher Education	409-414
25	Learner Driven Higher Education	415-422
26	Our Journey of Teacher Education	423-432
27	Indian Teacher Education: Whither To!	433-444
28	Universal Happiness & Peace	445-453
29	Educational Technology in India	454-467
30	National Education Day!	468-481
31	Scaling Educational Skills	482-501

Education in Search of Identity

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Some of the Universities in India, both, old and new, such as, University of Gauhati, Assam, University of Mumbai, Maharashtra and Ravenshaw University in Odisha are conferring Doctoral Degrees in Education under the Faculty of Arts. Education is not even considered by them an entity and faculty. So, there is a question of identity. Education which is unconditional greatest Service in Society has not been recognized by the Service Sector in India. UPSC in India has failed to include Education as a discipline. *There is a false notion that Education has only a little core, but, more of periphery. Education suffers from the missing elements of unique discipline which are non replicable in other disciplines.* It seems that such thinking has failed to appreciate that Education is the core of every discipline. Education is interdisciplinary. All the disciplines emerge from Education and merge into Education. Education does have a unique body of knowledge, a repertoire of unique skills and attitudes and a code of conduct. The code of conduct of doctors is- *servng the humanity without considering comfort or discomfort,* whereas, the code of conduct of Teachers is- *Eternal Learning & Teaching.* The soul of a gardener resides in the seeds, the soul of philosopher resides in the mind, the soul of piper resides in the pipe, the soul of a singer resides in the voice, the soul of a dancer resides in each & every body cell, the soul of a poet wanders in the nature, the soul of a sculpturist resides in the stone, the soul of a Governor resides with the public, the soul of the creator resides with the universe, the soul of a teacher wanders with the learners. Dancing crops, flowing wisdom, enchanting music, touching songs, resonating dance, immersing verses, speaking sculptures, and enlightened learners are the wonderful springs of nature. Education is a most comprehensive interdisciplinary discipline which educates the universe on what has gone by, where we are, where we want to go, and what we like to create, observing healthy, meaningful and full life.

Can we estimate the energy, purity and strength of the Soul of Education? Warriors may conquer at times physically, geographically, materially, it is only Education which through knowledge can bewitch the minds and liberate the souls. We always feel proud of the teachers

who taught us and who are teaching us. Their text is its own testimony. They do not require testimonials. The globe strives to emulate Indian Teachers & Learners. The following poem tries to depict Indian Teachers.



Teacher Education: Ethos

*We were never interested in B.Ed.
It is B.Ed. which interested us
We opted for wandering wild
But Education captured us;*

*Far from structure of Phenol
Far from synthesis of Cholesterol
Far from super- het Receivers
Far from gold medal achievers;*

*Far from differential & integral Calculus
Far from GeoGebra & Quadratic Equation
Far from Equity & Logical Operators
Far from Mega Projects & Micro Processors;*

*It is Education which eternally accomplished
The DNA structure, core & ethos of Life
More than Knowledge & Epistemology
Transcended us of Mind, Space & Time;*

*GURUS the best Form of GUNA, Still NIRGUNA
Always make our Lives Sublime
No Storms can Shake a Butterfly
on Flower Petals with Nectar Divine!*

*Education facilitates our transition
From atom to nucleus, from dot to globe
One with the universe, the latest version
From self to Self, the blissful immersion!*

Since ages the universe has been concern of Education. All were having access to Education for sharing their states. Teachers and Educationists were universally respected. Now the scenario is changing. Why Education is losing its identity? All of us have largely failed in realizing identity of

Education. Rather than others seeking guidance from Education, Education is being invited to receive dictations from State & Judiciary. Arbitrary policies & Judicial over activism are likely to damage Education. There is evident identity crisis of Education. It is high time for Education to realize its Identity. The question is why the identity crisis?

There is crisis of character. Soul of Education is being killed through ruthless expansion and privatization leading to marketization of Education. Market is being perceived as the arbiter of the morality. Blind ultra modernization has resulted into the corrosion of Eastern Values. We have lost our sensitivity to the basic values & SANSKARAS. The soul provides energy, whereas, the SANSKARAS provide modus operandi, but, the unbridled marketization of Education has reduced Education to a commodity to be brought & sold mechanistically in the market. Expression without essence and laughter without resonance are worthless. Convocation without invocation is useless. Graduates & Post-Graduates, degrees of a degree are of little value. Degrees do not guarantee achievement. Achievement is a function of variety of factors in which Knowledge, not merely Degree, is one of the elements. What use is the humanity degree which does not develop decency, decorum and discipline and fails to process us as human beings? What use is the Science degree which does not reconstruct in us open minded scientific outlook? What use are the law degrees if there is lawlessness. What use are the Political Science Degrees if we fail to develop Statesmen? What use is that Art which fails to manifest thematic creative expression? Mathematical formulas are empty & mechanistic if these fail to represent the reality. Social Science degrees which fail to produce Social & Civic Personalities and Citizens are gross wastage. What use is a Doctor of Philosophy Degree if we fail to philosophize the field? What use are the elections if we fail to find & elect Rajrishis?

“A Person was selling Sweet Orange Candies (SANTRE KEE GOLI) in a ST Bus. While asked what those Slices contained, the fellow was ignorant of the contents.”

“While asked who was – Maulana Abul Klam Azad and what does the name signify, a large majority of the Graduates were silent.”

There are innumerable instances of ignorance & silence. Is this the status of our Education?

Let us recall integral humanism of Sri Aurobindo & Wholistic Man of Vedic Period where the emphasis has been on wholistic education for man making- Physical, Mental, Social, Spiritual, Environmental, and finally universal being. Here we recall the efforts of Prof. T.N. Kapoor Former Vice Chancellor, Punjab University Chandigarh, who insisted that Principles & Philosophies of Education be taught even to the Commerce students.

The altruistic purpose of Teacher Education has been significantly lost. There is a need to strengthen Teacher Education at all levels.

Preface of the NCFTE (2009)

Preface of the NCFTE (2009) by Prof. Mohd. Akhtar Siddiqui former Chairperson NCTE reads-

“People in this country have been slow to recognize that education is a profession for which intensive preparation is necessary as it is in any other profession”. This concern expressed in the University Education Commission (1948-49) Report is alive in its relevance even today. The Education Commission (1964-66) professed, “The destiny of India is now being shaped in her classrooms”. So did the National Policy on Education 1986 emphasize: “The status of the teacher reflects the socio-cultural ethos of the society; it is said that no people can rise above the level of its teachers”. Such exhortations are indeed an expression of the important role played by the teachers as transmitters, inspirers and promoters of man’s eternal quest for knowledge. Should this role expectation be not taken as a rhetoric, but, as a goal to be constantly striven for, the urgency is to address ourselves seriously to examining the issues related to the preparation of teachers as well as to prune the theory and practice of teacher education. Though verily a professional, the teacher’s personality, in being humane to the learners, is the core foundational issue on which this Framework is based, in order that it has a bearing on transforming the very dynamics of teacher education *per se*. Two significant developments particularly, the National Curriculum Framework 2005 and the Right of Children to Free and Compulsory Education Act 2009, as well as, the fundamental tenets enshrined in the Constitution of India have guided the development of this Framework.

This National Curriculum Framework for Teacher Education (NCFTE, 2009) elaborates the context, concerns and vision underscoring that teacher education and school education have a symbiotic relationship and developments in both these sectors mutually reinforce the concerns necessary for qualitative improvements of the entire spectrum of education including teacher education as well. The new concerns of school curriculum and the expected transactional modalities have been emphasized in designing this Framework for all stages of school education. Issues related to inclusive education, perspectives for equitable and sustainable development, gender perspectives, role of community knowledge in education and ICT in schooling as well as e-learning become the centre-stage in the Framework.

A new approach to curricular areas of teacher education has been highlighted. The curriculum of teacher education is broadly dealt with under foundations of education, curriculum and pedagogy and school internship. The foundations of education include learner studies, contemporary studies, and educational studies. Curriculum and pedagogy deal with curriculum studies, pedagogic studies and assessment and evaluation studies. The school internship is visualized by situating the practice of teaching in the broader context of vision and the role of teacher and sustained engagement with learners and schools. In a departure from the existing approaches, the rationale of each major area along with curricular provisions, both in theory and practicum, have been indicated, leaving scope for individual reflection on the part of the institutions offering teacher education and the academics associated with them. Transaction of the curriculum and evaluating the developing teacher determine

the extent to which the ideas conceptualized are put into practice. The focus on process-based teacher education has been attempted as models for practicing teachers to adopt/adapt. The suggestion to establish Teaching Learning Centers to act as laboratories for the theory and practice of teacher training has been emphasized. An appropriate focus on continuous and comprehensive evaluation of developing teachers has been drawn up through an evaluation protocol and suggestions given for designing instruments for assessment and evaluation. The conventional models of teacher education may continue though the Framework does provide directions towards change in the structural aspects of teacher education at elementary, secondary and post-graduate levels. One reform that could achieve a breakthrough to vitalize teacher education and through it the process of learning and teaching is to break the isolation of teacher education institutions from the university life, from the schools and from one another. The Framework reiterates in unequivocal terms the need for this reform. Pre-service and in-service components of teacher education being inseparable, considerable focus has been given in this Framework on continuing professional development strategies. Since a major area of weakness in the existing teacher preparation programmes is the quality and experience of those who have the responsibility of training young entrants to the profession of teaching, a fresh perspective of preparation of teacher educators is dealt with in detail. This Framework is visualized to act as a catalyst to change the profile of teacher education so that the teacher education institutions become active centers not only of research but also of practical experiments directed to the improvement of educational methods and curricula. It is a matter of conviction that if teacher education institutions could be organized on right lines and become dynamic centers of progressive educational movements, the whole task of educational reconstruction would be greatly facilitated.”

NCFTE (2009) & NCF (2005): Achievement So Far

1. Attempts have been made to enrich the curriculum to provide for overall development of children through CCE. With all ifs and buts, with all Haves and Have Not, the CCE has its own Strength & Power. Continuous Comprehensive Evaluation is a Powerful Regulator. The voices of the Children in this context are- *“Play Way Activities We Play, The Science We Experiment, The Mathematics We Speculate, Stories We Narrate, Games We Play, Musical Notes We Generate, Keep Us Healthy & Gay. The continuous flow of the CCE has made our Studies full of life. The CCE has infused energy in all of us, the Teachers, Learners, Parents and the Society. We may be tired after days work, but, we don’t feel tired. CCE is not a burden. It is a band of Rhythm, Rhyme & Resonance. Along with the learners the innovativeness, creativity and efficiency of the teachers also increase significantly. The whole of Primary School System including Watchmen, Support Staff, Sweepers, Gardeners, Mess Staff, Office Staff, Teachers, Learners, Parents, Society, CBSE, the Primary Section Coordinator, School Management and the Principal Madam function synergetically. The entire Primary School System is fully lively & fruitfully functional due to CCE.”*
2. There is added focus on Multiple Intelligence & Life Skills.
3. Critical Pedagogy has been promoted in various dimensions of the School through Cooperative Learning, Participatory Approach & Action Research.
4. Rarely attempts have been made to motivate children from marginalized sections of society for expression of their knowledge & skills related to work and to have cumulative human experience along with children from other sections.

5. Rare attempts have been made to develop Citizenship Skills. There is evident rejection of the old and acceptance of the new.
6. There are segregated schools on the bases of Public & Private, Medium of Instruction, Religion, Region, and School Boards. All this segregation has resulted into the fragmentation of the Society. There are marked differences between Municipal Corporation Schools & Private Schools, Native Schools & International Baccalaureates.
7. The private school students may have higher academic achievement, but, they may have ethos related limitations. Very often a non-native language is barrier in constructing knowledge.
8. Even now the children are deprived of the learning opportunities that occur in classroom with children from diverse Socio-Economic & Cultural Backgrounds.
9. A large number of Public Schools still suffer from shortage of facility of infrastructure. It affects adversely not only academic learning but also overall health of the children.
10. There are rare teachers who have both teaching competencies & teaching attitude. Humane & Professional Teachers, both, in one are rarely found.
11. There is a need to redesign Teacher Education Curricula and modes of transaction, as well as, approaches to inculcate universal values, namely, truthfulness, compassion & forbearance.
12. Our School Education has to be strong enough to appreciate the preamble of Constitution of India which demands determination & action to constitute, sustain and strengthen India into a Sovereign, Socialistic, Secular, Democratic, Republic State.
13. The sharp disparities between different Social & Economic Groups are everywhere in the perceptible range in India. Even now the children of the disadvantaged groups are educationally most vulnerable.
14. Though we have large number of multi-grade schools based on mechanical principle of Teacher-Pupil Ratio, within 1Kilo Metre of each habitation, yet, we have not been in a position to provide compatible Pedagogy.
15. Child Centered Education is still in infancy.
16. Constructivist Learning Approach has been talked a lot, but, rarely implemented in the Schools.
17. Many a Schools have initiated into Activity Based Approach, but, it needs to be strengthened.
18. Rarely teachers are competent to deal with Inclusive Classes.
19. Diagnosis & Remediation are done rarely.
20. School Stereotypes exist even now, such as, notion of uneducable children, marginalized groups, Gender Type Stereotypes, Children with disabilities, first generation learners.
21. Problems of bridging the home language and school language.
22. A vast array of human vocations, such as, weaving, carpentry, farming and occupations, such as, shop keeping constitute a valuable form of knowledge. These forms of knowledge are of practical nature, tacit, but, often only partially articulated.
23. Neither the curricular nor the co-curricular activities are up to the mark.
 - Many a children in English Medium Schools are not at ease with English, worse is the scenario on vernacular.
 - Mathematics Teaching-Learning is dull & dry
 - History & Civics are gone
 - No sensitivity to cultural heritage & religious heritage & eastern values
 - Social Sciences seize to have normative responsibility

- Science is losing Scientific Outlook & In-look
 - Wholism is a figment of imagination
24. Health Education, Human Rights Education, Environmental Education, Art Education, Physical Education, Education for Peace & Harmony have become empty slogans.

Challenges & Reality

- Manpower Planning is relatively absent in Teacher Education. There is remarkable increase in the number of Teacher Education Institutions.
- There are mismatches between the Teaching Degrees & Levels Taught.
- Some of the States filled new vacancies with Para-Teachers, while trained teachers remained unemployed. Honorarium per month of the para teachers appointed in different States ranges from Rs. 1000/= pm (Andhra Pradesh) to Rs. 4500/= pm (MP).
- In some of the States, such as, MP, Gujarat future teachers in the formal system will be “SHIKSHA KARMIS/SHIKSHA SHAYAK” on performance contract.
- Indian Teachers have been teaching in the Schools in West Asia, particularly, the United Arab Emirates. Mathematics, Science & English Teachers are in maximum demand. Thousands of Secondary School Teachers are already employed in foreign schools.
- There are problems of Education right from pre-natal stage to old age.
- Children are losing their beauties of childhood.
- Children are interested in fast & junk food than home made food.
- Children are going far away from nature, because, we have failed in sustaining the beauties of nature.
- The eastern ethos & sensitivity to the basic values are fading.
- The entire School Education- History, Civics, Language, Mathematics, Science are losing their essence.
- The creativity of the children is killed by the schools.
- There are problems of cell phones & face books.
- Only God knows what the children Twit & Skype.
- Adolescents are bewildered. It seems the Sociologists, Psychologists and Counselors have largely gone defunct.
- Educational Institutions have started disowning their own Product. What are the SET, NET, TET, TAT representatives of?
- There is little convergence amongst State, Society, Education & Judiciary.

- More than Solutions, there are Problems of all sorts of Education-School Education, Teacher Education, Medical Education, Engineering Education, Law Education, Art Education, Science Education.
- Education, Research & Development are the least priority as is evident through the investment by the State.
- Apex Institutions, such as, NCERT, NCTE, NUEPA, ICSSR, CIIL, UGC & NAAC have lot of potential but for expression.
- Health Education & Environmental Education are the most neglected areas.
- Public at large is indifferent towards Education.
- Corporate Social responsibility finds rare expression.
- Rather than wholistic, what we have is fragmented Education.
- There is no where dedicated Teacher education in India.
- The identity of Education as highest interdisciplinary is rarely recognized & respected.
- Content-Pedagogy-Technology integrated Education is a big challenge.
- Skill Training is lacking. Education is failing to appreciate innovative courses, such as, Taxonomy of Educational Skills.
- Teacher Education on Life Skills, such as, lateral & critical thinking, innovativeness, problem solving needs to be strengthened.
- With the implementation of SSA there is relatively better state of Education.
- We need thorough preparation for Teacher Education at all levels, from Pre-Primary through Higher.

Teacher Education: Quality Concerns

1. Manpower Planning

Total number of recognized Teacher Education Institutes in India as on 31.03.2013 is 13054 (ERC 944, WRC 3904, NRC 3409 & SRC 4797). Total Teacher Education Courses recognized & intake approved are presented through Table 1.

Table 1: Total Teacher Education Courses Recognized & Intake Approved

SNO	Teacher Education Course	Number Recognized 31.03.2013	Intake Approved 31.03.2011	Intake Approved 31.03.2012	Intake Approved 31.03.2013	Additional Intake Approved during 2012-13
1	Pre-Primary	253	12438	12388	12538	150
2	Elementary	7191	337817	336527	394028	57501
3	B. El. Ed.	17	627	627	627	000
4	D. El. Ed. (Distance Mode)	1	-----	----	500	500
5	B.Ed. (F2F)	6660	650901	657541	682086	24545
6	B.Ed. (Distance Mode)	37	20450	20450	20850	400
7	M. Ed. (F2F)	928	22805	23255	23680	425
8	M. Ed. (Distance mode)	10	1605	1605	1645	040
9	M.Ed. (Part Time)	7	175	175	175	000
10	C. P. Ed.	145	7347	7297	7287	-010
11	B.P. Ed.	528	29969	29869	30819	950
12	M. P. Ed.	139	3937	4237	4457	220
13	Others	254	18489	18489	18639	150
	Total	16170	1106560	1112460	1197271	84811

It is evident from Table 1 that Total Number of Teacher Education Institutions in India as on 31.03.2013 was 16170, whereas, the approved intake was 1197271. Surveys be conducted by all the States in India to ascertain the Teachers required at various levels. There should be one to one correspondence between School education & Teacher Education. Man Power Planning in Education & Teacher Education ought to be done scientifically.

2. Multi-Mode Teacher Education

It is highly desirable that the first Professional Degrees/Diploma in Teacher Education be offered only in Face to Face (F2F) mode. But, F2F mode of Teacher Education is not that credible as it used to be. Even in the F2F mode, it is publicly evident that there are Teacher Education Degrees, such as, D.El.Ed., B.Ed. , particularly, in the Private Sector with & without attendance. A large number of Teacher Education Institutions are under staffed. Infrastructural facilities are inadequate. There are innumerable problems.

Further, Open & Distance Learning (ODL) mode can also provide very good platform. Many a web 2.0 Tools, Social Networking Sites, like, Edublogs, Blackboard, Twitter, Groups in Facebook, Skype, Whatsapp are very good, where, teachers can interact in synchronous as well as asynchronous mode. It can be blended with F2F mode. Web Portals are required where many a teachers come together. There are many Open Education Resources for Teacher Educators, Teachers & Learners, namely, GeoGebra , Google Earth, Hot Potato, C-map , R-campus, Mahara, Moodle and Wikispaces, Classroom 2.0, Visual Field Trip, In-Service Training Program, Academic Association, Collaboration & Forum, Journals & other Resources, Statistical Tools, and Web Conferencing. There are many a mass media, such as, Educational radio, ETV, along with Satellites.

No mode of Teacher Education, however modern or classical, stand alone, is self contained. There ought to be mutual support. Teacher Education in India ought to be multi-mode. There should be sharing of strengths amongst various modes, namely, F2F, ODL, Electronic, Correspondence.

3. Dedicated Teacher Education Programs

Dedicated Teacher Education Programs ought to be tried at the laboratory level, such as, B.A./B.Sc./B.Tech./B.Com. B.Ed. (10+2+4), M.A./M.Sc./M.Tech./M.Com. M.Ed. (10+2+7), M.A./M.Sc./M.Tech./M.Com. Ph.D. (10+2+7+3). These Programs be offered as Innovative Programs. There is a notion that the duration of Teacher education Programs be increased. Will increase in Time Duration of Teacher Education Programs assure and Ensure Quality Teacher Education? There ought to be added focus on In-Service Professional Development of the Teachers. Rather than issuing life Long Teaching Licenses, these could be renewed periodically.

4. B.Ed. integrated or B.Ed. Sequential

The nation has decided to offer B.A. Ed. in all the Central Universities of India. Though it is an arbitrary National policy decision, but, it does not mean that B.A. Ed. Integrated has supremacy over B.A. B.Ed. Sequential. Both have their due place in the realm of Teacher Education. The face validity of both the programs reveals that both these ought to have separate norms.

5. Innovative Teacher education

Innovative Teacher Education, such as, Personalized Teacher Education, Wholistic Teacher Education, Technology Integrated Teacher education, Bachelor of Computer in Education (B.C.Ed.), Master of Computer in Education (M.C.Ed.), Integrated Teacher Education, e-Teacher Education ought to be promoted.

6. Specialized Teacher Education

Teacher Education ought to specialize in many areas, such as, Art Education, Health Education, CSR & Education, ICT in Education, Yoga Education, Value Education, Inclusive education, Social Networking, Taxonomy of Educational Skills, Taxonomy of Educational Research. There is a need to offer programs, such as, B. El. Ed., M. El. Ed., B.C.Ed., M.C.Ed., Bachelor of Management Education (B. M. Ed.), M. M. Ed.

7. Quality Indicators

- a. Curriculum Design
- b. Curriculum transaction & Evaluation
- c. Research, development & Extension
- d. Infrastructure & Learning resource
- e. Student support & Progression
- f. Organization & Management

How to observe quality ought to be spelt very analytically & comprehensively. There should be Teacher Education Quality Assurance.

8. JNTU, IGNOU and Faculty Development Programs for Teacher Educators

It is a welcome movement that the Nation is thinking of Professional Development of Teacher Educators through the JNTU and IGNOU. It is a happy moment to learn that IGNOU which is ensuring the Compatible and Quality Teacher Education is expected to offer Faculty Development Programs. The JNTU being an established Technology University is also expected to intervene Teacher Education.

The roles expected of these two Universities with respect to Professional Development of Teacher Educators and Teachers need to be delineated scientifically.

9. Capacity Building Courses in Teacher Education

Courses, such as, follows could be offered by the SCERTs, ASCs , RCCs, IASEs, and CTEs:

1. ICT in Education
2. Social Networking
3. Info-Savvy Skills
4. Techno-Pedagogic Skills
5. Teacher in the Digital age
6. Open Education Resources
7. Taxonomy of Educational Skills
8. Taxonomy of Educational Research
9. Educational Research Thrust in India
10. Collective Wisdom of India
11. Researching Pioneer Competency
12. Teacher Competency: Mapping & Management
13. Researcher Competency: Mapping & Management
14. Health Education in India
15. Corporate Social Responsibility & Education
16. Vocational & Occupational Skills
17. Management Skills

18. Life Skills & Attitude
19. Management Skills
20. Adjustment Skills
21. Special Education Skills
22. Human Development Skills
23. Accountability & Adaptability
24. Communication Skills
25. Self Direction Skills
26. Social responsibility Skills
27. Human Relations Skills
28. Emotional Skills
29. Spiritual Intelligence Skills
30. Innovation, Creation & Construction Skills
31. Whoilstic Education Skills
32. Interdisciplinary Skills
33. Value Integrated Education
34. Yoga Education Skills
35. Qualitative Research in Education
36. Employing Mixed Research Methodology
37. Development of Tools & Techniques for Educational Research
38. Shifting Paradigms of Teacher Education
39. Quality Indicators of Teacher Education
40. Ensuring quality of Teacher Education
41. Identity of Education
42. Cultural, Moral & Religious Heritage of India
43. Developmental Challenges & Educational Determinism
44. Status of Educational Predicaments & Constitutional Right To Education
45. Status of Human Development Index in India
46. Universal Happiness Index
47. Status of Teacher Education in India
48. Establishing Equivalence of Teacher Education Modes
49. Formulating Teacher Education Policy
50. Establishing Norms for Teacher Education Parameters
51. Education for the Disadvantaged Groups
52. Inclusive Education
53. Continuous Professional development of Teachers
54. Career Advancement in Teacher Education
55. Re-visiting Teacher Education Curricula
56. Re-Visiting Act, Norms & Regulations of Teacher education
57. Establishment of Inter-University Consortiums in Teacher education
58. Exploring the Possible Roles of State, Society, Education & Judiciary in Teacher Education
59. Research Agenda for Teacher Education

60. Developing Competencies of Teacher Educators for Enhancing Creative Writing Abilities of the Learners
61. ICT Aided Constructivist Approach for Professional Development of Teachers
62. Reflections on the Academic Performance Indicators
63. Indian Consortium of Research in Education & Strengthening Educational Research
64. Action Research as “ My Research”
65. Research Synthesis & Meta Analysis
66. Educational Philosophy of India
67. Quality of Indian Teacher Education
68. Manpower Planning in Teacher Education
69. Digital Lesson Designing & Implementation
70. Developing Professional & Humane Teachers
71. School Curriculum Framework & Teacher Education Curriculum Framework
72. Teacher Education: Public & Private
73. Multiple Intelligence
74. Policies & Programs
75. Assessment through Rubrics
76. Portfolio Assessment
77. Working With Community
78. Symbiosis
79. Participatory Approach of Problem Solving
80. Cooperative Learning
81. E-Learning Packages on various Methods
82. Specialized Teacher Education Programs
83. Pedagogy: Critical, Reflective & Constructive
84. Teacher Education for Disadvantaged & Differently Able Groups
85. Physical Education
86. Education for Skill Development
87. Education for Parenting
88. Development of Skills for Food Processing
89. Psychology of Infant, Child, Adolescent, Young, Adult & Ripe
90. Education of Eastern & Western Values

10. Human Resource Development Centres (HRDCs)

The UGC has converted ASCs to HRDCs. Now that the name of the MHRD has been revived as Ministry of Education; there is a need to find compatible Name for the HRDC, such as, HBDC (Human Being Development Center).

11. Unique ID of Every Teacher Educator & Teacher Education Institution

Time & Again there is a suggestion that the NCTE should provide unique ID to every Teacher Educator and Teacher Education Institution. How can NCTE provide unique identity? If unique identity is a number, certainly a centrally established agency can provide it. But in reality the unique ID is acquired through peer review and evaluation over a period of time. Unique Identity is earned through dedication, innovation, continuous struggle and identification with Education & Teacher Education. Therefore we need to clear which shade of identity we are referring to as a goal.

12. Career Advancement of Teacher Educators

Let the Professionals have Career in Teacher Education. Do not upgrade us or downgrade us through the questionable scales. Career Advancement in Higher Education has become more of a matter of Whims and Fancies of , so called, Expert Committees. There are questions asked , such as, was there a casualty in the Promotion Committee. We need to perfect the APIs. Very often mere nomothetic compliance is promoted than real merit.

13. Teacher Educators for D. El. Ed are not Qualified

Most of the Teacher Educator at the D. El. Ed. are not qualified for the Elementary Level. Most of them have M.Ed. or Masters Degree in any School Teaching Subject & Diploma in Education. M.Ed. (Elementary) or degree & Diploma in Elementary is highly desirable, but, rarely available. A foundation course in Elementary Education ought to be mandatory for their confirmation as Teacher Educators at the D. El. Ed. level, because, unless they have understanding of the Stages of Social Maturity of the Children how can they educate them. There are many a Stages of Social Maturity, such as, Incorporative, Impulsive, Interpersonal, Institutional, and Inter-Individual. How can they be Teacher Educators at this stage without having comprehensive understanding of the children; their wholistic profile-Physical, Cognitive, Affective, Psychomotor, Spiritual & Environmental?

Summary of Recommendations of Justice Verma Commission

Quality of Pre-service Teacher Education

1. Around 90% of pre-service teacher education institutions are in the non-Government sector, and most of the States of the Eastern and North-Eastern Region of the country are facing acute shortage of institutional capacity of teacher preparation in relation to the demand. The Commission recommends that the Government should increase its investment for establishing teacher education institutions and increase institutional capacity of teacher preparation, especially in the deficit States.
2. Government may explore the possibility of instituting a transparent procedure of pre-entry testing of candidates to the pre-service teacher education programmes, keeping in view the variation in local conditions.
3. Teacher education should be a part of the higher education system. The duration of programme of teacher education needs to be enhanced, in keeping with the recommendations of the Education Commission (1966), the implementation of which is long overdue.
4. It is desirable that new teacher education institutions are located in multi- and inter-disciplinary academic environment. This will have significant implications for the redesigning of norms and standards of various teacher education courses specified by the NCTE. This will also have implications for employment and career progression of prospective teachers. Existing teacher education institutions may be encouraged to take necessary steps towards attaining academic parity with the new institutions.
5. Current teacher education programmes may be re-designed keeping in view the recommendations in the National Curriculum Framework for Teacher Education (NCFTE, 2009) and other relevant material.
6. In keeping with the recommendations of the Education Commission (1966), every pre-service teacher education institution may have a dedicated school attached to it as a laboratory where student teachers get opportunities to experiment with new ideas and hone their capacities and skills to become reflective practitioners.
7. There is a need to establish a national level academic body for continual reflection and analysis of teacher education programmes, their norms and standards, development of reading material and faculty development of teacher educators.
8. As a matter of policy, the first professional degree/diploma in teacher education should be offered only in face-to-face mode. Distance Learning programmes and the use of blended learning material may be developed and used for continuing professional development of school teachers and teacher educators.
9. The institutional capacity should be increased for preparation of teacher educators. There is a need to make the Masters in Education programme of 2 –year duration with the provision to branch out for specialization in curriculum and pedagogic studies, foundation studies, management, policy and finance, and other areas of emerging concerns in education.
10. The NCTE would need to develop broad-based norms for qualification of teacher educators to enable induction of persons with post graduation degrees in education science, social sciences, languages and mathematics, along with a professional degree in teacher education or a research degree in education, as teacher educators.
11. The idea of creating opportunities for teaching practitioners to teach in teacher education institutions, as visiting faculty, may be explored. Similarly, teacher educators could be considered as visiting faculty in schools.
12. Faculty development programmes for teacher educators should be institutionalized.

13. There is need for enhanced investment in promotion of research in education in general, and in teacher education in particular in the universities; creation of an Inter- University Centre in Teacher Education could play a significant role in this regard.

Quality of In-service Teacher Education

14. The Government is required to appoint an Expert Group to develop a policy framework for in-service teacher education in consultation with national and State level institutions, including institutions of higher education, representatives of the State Governments and teacher organizations, while taking into account the principles suggested in this Report, and also develop a National Action Plan for implementation of the policy and guidelines for formulation of State Action Plans.
15. All existing teacher training institutions imparting in-service teacher education need to be strengthened. In particular, the decentralized structures of BRCs and CRCs be strengthened with provisions for human and physical resources to enable them to perform effectively. Similarly, the DIETs and SCERTs also require strengthening.
16. There is an urgent need to develop comprehensive programmes for continuing professional development of secondary school teachers. Towards this, existing institutional arrangements have to be significantly enhanced, along with strengthening of CTEs and IASEs. Besides, some post-graduate colleges and Department of Universities may also function as training centres, especially for secondary school teachers, as well as for educational planners and administrators.

Teacher Performance and Teacher Audit

17. The Central Government, in consultation with the State Governments and other stakeholders, may develop a framework for assessment of teacher performance, keeping in view the guidelines suggested in this Report.

Strengthening the Regulatory functions of the NCTE

18. The NCTE needs to review the existing norms and standards for the various teacher education programmes and create a Standing Committee for periodic review of curriculum and the norms and standards of the programmes.
19. The NCTE should develop comprehensive guidelines for innovative teacher education programme for grant of recognition.
20. The NCTE should develop a new framework for undertaking inspection of the recognized institutions, with enhanced focus on process parameters, to ascertain the quality of the institutions, and take appropriate action to improve the overall quality of the teacher education system.
21. The NCTE should formulate appropriate regulations for implementing section 17, of the NCTE Act, 1993 taking into consideration the guidelines incorporated in this Report.
22. The NCTE should set up a Teacher Education Assessment and Accreditation Centre (NEAAC), and constitute a Committee to prepare a comprehensive framework of accreditation, as suggested in this Report.
23. The NCTE should set up an institutional platform in close coordination and collaboration with State Governments, Universities, UGC, Distance Education Council (DEC), etc. and take decisions on standards , procedures and quality parameters, concerning teacher education.

24. The NCTE should notify Regulations to govern inspections of teacher education institutions. These should include eligibility conditions for empanelment as inspection team members, composition of an inspection team, time required for conducting inspection, format for obtaining the required information from the concerned institution and submission of the inspection report.
25. In order to ensure accountability, it is essential to establish a Vigilance Cell in the NCTE, on priority, which would investigate into any act of misbehaviour and misconduct on part of the various functionaries associated with the NCTE.
26. The tenure of the office of the Chairperson and the Vice-Chairperson of the NCTE should be raised from 4 years to 5 years and the upper age limit should be raised from 60 years to 65 years.
27. The Central Government should develop guidelines regarding the manner of appointment of members of the Council. Further, members of the Regional Committee should be appointed by the Council.
28. The Commission examined the implications of the ruling of the Supreme Court in the case of NCTE vs Vaishnav Institute of Technology and Management, dated 12th April, 2012 and the consequent difficulties in causing inspection under section 17 of the NCTE Act. The Commission proposes that section 17 of the NCTE Act be suitably amended to enable inspection of institutions, unless the Supreme Court reconsiders its decision.
29. Appropriate amendments be made in the Act to provide for the following:
 - (i) Empower the Council to issue directions to the Regional Committees on matters of policy and for effective implementation of the Act, which shall Be binding on the Regional Committees;
 - (ii) Empower the Regional Committee to review its order to rectify a mistake apparent from Record; and
 - (iii) Enable the Council to revise an order passed by the Regional Committee under sections 14 and 15 of the Act, either on its own motion or on the basis of information made available, where the Council is satisfied, for reasons to be recorded in writing that the Regional Committee has granted recognition/permission in contravention of the provisions of the Act, or the Rules and Regulations made thereunder, and pass appropriate orders, after affording reasonable opportunity to the institution.
30. The NCTE should appoint a Task Force to undertake organizational restructuring of the NCTE, and to work out its human resource requirement, as suggested in this Report.

Action Plan for Quality Teacher Education

1. The Teacher Educators at any level of Teacher Education should be essentially Master Degree in Education.
2. Teacher Education should be mandatory for Teaching at Higher Education level also in all the disciplines. Education for Teaching Higher Education is gaining momentum globally.

3. The Constitution of the present Council (General Body) of the NCTE needs to be examined.
4. The thinking that Integrated Teacher Education is more effective than the Consecutive Teacher Education needs to be reexamined. There is little evidence of its efficiency and cost effectiveness.
5. Instead of increasing the duration of Teacher Education Programs, the emphasis should be on multi-modes of learning. The nation cannot afford to offer Teacher Education degrees to millions through Face to Face mode only. All the modes of Teacher Education should be strengthened. In-Service Modes of Teacher Education ought to be strengthened.
6. Teacher Education should be offered under the Faculty of Education. All those universities in India which are offering Teacher Education Degrees under the Faculty of Arts should be directed to establish the Faculty of Education.
7. Integrated Teacher Education Programs, such as, B.A.Ed., B. Sc. Ed., B. Com. Ed. (10+2+4), M.A.Ed., M. Sc. Ed., M. Com. Ed. (10+2+5), Ph.D. in Education (10+2+5+minimum 3), be offered in Education.
8. Programs, such as, Bachelor of Educational Management, Master of Educational Management, Bachelor of Computer in Education, Master of Computer in Education, Bachelor of Elementary Education and Master of Elementary Education ought to be introduced.
9. There should be added focus on practicum in all the teaching modalities. There is a wide scope for integration of numerous skills. More complex skills in a variety of learning situations is a need of the hour. Taxonomy of Educational Skills be introduced at the National level.
10. Decision to change the size of an intake Unit at any level of Teacher Education should be taken on scientific bases.
11. ASCs and DIETs should offer dedicated in-service programs for the Professional Development of Teacher Educators & Teachers.
12. Blanket YES or Blanket NO with respect to a Teacher Education Program by any State should not be acceptable by the NCTE. The State Governments be advised to provide NOC application-wise. Also, applications be invited by the State Governments to establish Teacher Education Institutions as per requirement, area-wise and level-wise.
13. Teacher Education should be open to all the disciplines, such as, Arts, Commerce, Science, Technology, and Inter-disciplinary.
14. Teacher Education should offer areas, such as, Health Education, Corporate Social Responsibility & Education, Constructivism & Connectionism.

15. There has been added focus on Teacher Education at Secondary School level, whereas, Elementary Education has been relatively neglected. We have not yet ventured into Teacher Education at Higher Education level.
16. It is high time for India to revive the NCTE, with full respect, to regulate the Teacher Education.
17. A Central University of Technology Integrated Teacher Education (TITE) ought to be established with satellite campuses in all the regions.
18. All the emerging paradigms of Teacher Education ought to observe their ethos, such as, O & D Teacher Education , Integrated Teacher Education, e-Teacher Education, and of course, the F2F Teacher Education.
19. Content-Pedagogy-Technology integrated modes of Teacher Education need to be strengthened.
20. Innovative Programs offered by some of the Universities ought to be further deployed.
21. Indian Consortium of Research in Education (ICORE) has been launched at CASE, Vadodara, Gujarat, India. It should be further strengthened to share Educational Research all over globe (www.icorecase.org).
22. Programmatic research should be encouraged.
23. Taxonomy of Educational Research ought to be arrived at. There ought to be due focus on positivism & logical positivism, Interpretative & hermeneutic, as well as, critical reality paradigms.
24. The course work made mandatory by the UGC for Ph.D. in various disciplines, including Education has resulted into mechanization of Research in India. Attempts should be made to de-mechanize research leading to innovative, creative and constructive research.
25. There should be dedicated composite PG programs in Education, say, M.Ed. after +2 or dedicated Ph.D. in Education (B.Ed. M.Ed. & Ph.D.).
26. The apex agencies & institutions, such as, CASE, CIIL, HBCSE, ICSSR, NCERT, NCTE, NUEPA, UGC should decide the Research Agenda for the Nation.
27. The NCERT should sustain its Research Heritage of Educational Surveys. The Nation is expecting the next Educational Survey. It is high time that the NCERT brings out the Educational Survey in e-form, also.
28. There should be a Countrywide debate on Teacher Education Policy. We ought to have Teacher Education Policy.

Concluding Remarks

Educationists must think of Education in a holistic manner and not from the perspective of narrow specialization which obliterates the big picture. Too much of respect for compartmentalized domains of Education defeats the basic goal of developing integrated personality. Perhaps the biggest error of Kothari Commission on Education is to consider the Education in compartmentalized fashion. There is a need of doing thorough functional analysis for realizing the identity of Education & Teacher Education. The NCTE may revisit the Act, Norms and Regulations, which at places, seem to be more idealistic than realistic. The recommendations of Justice Verma Commission ought to be scientifically implemented, where needed & feasible. The Indian Teacher Education calls for revolutionary changes. Content,

pedagogy and technology ought to be integrated. There should be open forums and public debates on Teacher Education Policy in India. We ought to have a Comprehensive Teacher Education Policy.

Educational Research & Sustainable Development

Chhaya Goel & Devraj Goel

Educational Research is very often blamed to be descriptive and evaluative, rather than suggestive and contributing to policy formulation. There are wide gaps amongst developmental challenges and educational research determinism. Hardly 1% of the GDP is being invested on Research and Development in India. Problems are published every where. But, the solutions are rarely visible.

Here is an attempt by a team of investigators to research various areas, namely, Educational Skills, ICT for Quality Research, ICT Aided Constructivist Approach in Learning Science & Development, Status of Prospective Teacher Educators on Self Awareness & Environmental Awareness , Educational Development of the Visually Challenged, Research & Action Plan for Quality Teacher Education, Growth Rate of various States in India & Human Development Index (HDI), and Health Education and Development.

Research without construction and development does not have much of significance. Diagnosis without amelioration is painful. The attempts made by the budding scholars for development through Research are appreciable. The present paper definitely presents the zeal of the dedicated researchers in the realm of Research & Sustainable Development.

a. Research Scholars on Educational Skills

Ultimate aim of education any where is to develop a complete human being. For that skills need to be developed in all the domains to live happy, productive and peaceful life. Hard skills are the core skills which are required for innovation, creation, construction, and production in various disciplines, such as, Physics, Chemistry, Mathematics, Biology, Engineering & Technology, Arts, Commerce. The various phases are sensitivity, germination, incubation, innovation, creation, construction, development and implementation, whether it is designing, production and flying of an aero-plane or sensing, creating, composing and reciting a poem, or formulating, producing, analyzing and injecting a drug, or designing, development, organization and administration of an institution. Soft Skills are needed for everyday transaction. These are

required for how people relate to each other: communicating, engaging in dialogue, giving feedback, cooperating as a team member, contributing in meetings and resolving conflicts, setting an example, team-building, facilitating meetings, encouraging innovations, solving problems, making decisions, planning, delegating, observing, instructing, coaching, encouraging and motivating. To be good at hard skills usually takes smarts or IQ (also known as our left brain-the logical center). To be good at soft skills usually takes Emotional Intelligence or EQ (also known as our right brain- the emotional center). Hard skills are skills where the rules stay the same regardless of which company, circumstance or people you work with. In contrast, soft skills are self management skills and people skills where the rules change depending on the company culture and people you work with. For example, programming is a hard skill. The rules for how we can be good at creating the best code to do a function is the same regardless of where we work. Communication skills are a set of soft skills. The rules for how to be effective at communication change and depend on the audience and the content we are communicating. Hard skills can be learned in school. There are usually designated level of competency and a defined path as to how to excel with each hard skill. Most soft skills are not taught well in school and have to be learned on the job by trial and error. Careers can be classified into three categories, careers that need hard skills and little soft skills, both hard & soft skills, mostly soft skills and little hard skills.

But, Hard Skills & Soft Skills combination is rarely found. There is less research, but, more publication, less creation but more communication, less production, but, more marketing and vice versa. Masses are lost in customary designs. Hard Skills which emerge through sound theoretical base or lead to theory, with practice, patience and perseverance having precision and perfection passionately emerge. Soft skills demand environmental sensitivity & action. Communication, transaction and transmission through the soft skills infuse life into this sphere.

Here, the intent is to arrive at a combination of hard skills & soft skills. Hard and soft skills are often referred to when entering into & living a profession. While hard skills are essential to enter, it is the soft skills that facilitate professional ethics & aesthetics. To be a good personality

fit for any profession we need to be quality producers, humanistic communicators, and civilized & scientific consumers.

The establishment has outgrown in most of the fields in India, such as, Teacher Education, Engineering, Medicine, and even Agriculture. The main cause & effect are the improper planning & unemployable product. The human development should ensure self-employability in respective fields.

Science without experimentation skills, Art without creativity, Commerce without substance, Mathematics without speculation, Logic without reasoning, Schools without life skills, Polity without statesmanship, and nature without beauty are empty. There is a need to realize skills in all the areas. But, the question is have Life Skills, Thinking Skills, Human Development Skills, Management Skills, Emotional Skills, Adaptability and Social Responsibility Skills, Vocational Skills, Professional Skills, and many more skills have achieved the status of Skills? The complexity of the prevailing conditions demands skills for healthy, peaceful, harmonious, meaningful living under highly complex socio-cultural-political-economic-demographic conditions. So, there is a need to integrate skills in Education. There are innumerable skills which various tasks demand. There is a need to arrive at skill level in all the areas to cope up with the challenges. Education ought to be rational as well as scientific. There is a need to realize Skill inclusive, Skill integrated, and Skill evolving School Education & Teacher Education at all levels, right from pre-primary to tertiary & continued education. The present study has explored the status of Education Scholars on various Skills.

The Scholars have been found (Goel & Goel 2012) to have varied profiles on educational skills. On some skills higher, on some lower, whereas, on the other skills in between. The scholars who philosophise at doctoral level in various disciplines ought to immerse themselves in their realm fully. Education Scholars by virtue of their discipline have to be wholistic. It is evident from the idiographs that some scholars are higher on Information & Media Skills, Info-Savvy Skills, Technopedagogic skills, but lower on Yoga Skills, and Techno-Management Skills. Some scholars who are higher at Self Direction Skill and Social Responsibility Skills are lower on Techno-Living Skill. The scholar who has been found highest over all and on Adaptability &

Accountability Skill, Communication Skill, Information & Media Skill, Problem Solving Skill, Self Direction Skill, Social Responsibility Skill, Human Relations Skill, Emotional Skill, Life Skill, Adjustment Skill, Human Development Climate Skill, Research & Construct Skill and Citizenship Skill, has been found relatively low on Wholistic Education Skill, Yoga Skill, Techno-Special Skill & Techno-Living Skill and inbetween on critical thinking & systems thinking and life skills. It is desirable that all the scholars have all the educational skills at the optimum level. As, a whole the skill scenario of the scholars has been found to be promising. But, there is always scope for perfection. We should be in a position to employ any skill timely, easily, precisely and joyfully. But, how to realize this vision?

The complexities of the living conditions demand skillful persons in various dimensions of life. All the skills have their own significance. Info-Savvy & Digital Skills are as important as Spiritual Intelligence and Yoga Skills. Self Awareness Skills are as important as Systems Thinking Skills. Production Skills are as important as Consumption Skills. Zooming out is as important as Zooming in. Personal Skills are as significant as Citizenship Skills. General as well as Special Skills have their own value. Research is as important as Construction. Downloading is as important as uploading. How can life be a network of arrays of innumerable skills, where, ideas spring, feelings flow, motor creates, spirit reins, and the self resonates with the sphere in this digital age? Dancing crops, flowing wisdom, enchanting music, touching songs, resonating dance, immersing verses, speaking sculptures, enlightened learners, innovative researchers, skillful scholars and creative constructors are the wonderful springs of nature.

b. ICT in Education : Research & Policy Imperatives

- The ICT policy in bits and pieces leads us no where. There is an immediate need of ICT Policy in India. Scenario is not much different in all the South Asian Countries, namely, Afganistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Srilanka. Haryana, Kerala, and Karnataka are doing relatively better through ICT. The other States of India and South Asian countries may emulate them.
- Every child in India should have access to compatible technology. The joy & vision in their eyes and momentum in their muscles, can definitely accelerate the development

of India. The energies of young critical mass of India ought to be scientifically channelized in the Technology Culture, so that , they develop a congenial media culture in this media crowd.

- To enable creative & constructive use of Technology there is an immediate need of inspiration, aspiration and perspiration.
- There should be ICT configured curriculum in all the disciplines at all levels, right from executive to the remotest field.
- There ought to be national repository of information for open sharing.
- Investment in ICT ought to be decided scientifically and amicably. There are 44.3 million school going age children off school. There are 500 million men & women off school. North East of India is relatively backward. Many a States are backwards in many a areas. Could we explore the possible role of ICT for realizing better status?
- How can ICT be used for capacity building? Many a areas, such as, Education, Health & Hygiene, Administration, Science Laboratories, Entrepreneurship, Technology & Engineering, Medicine, Agriculture & Horticulture are starving and striving for the suitable integration of ICT.
- The digital wave in Bhutan is appreciable. What use is ICT if it does not contribute to the Human Development Index? Let us enable the society through ICT and empower the nation.
- Nepal is trying to bridge the gap between two generations, that is, teachers & learners in the realm of ICT. India has the similar scenario. There is a need to develop Professional Development programs without any further loss of time. Why should teachers and learners be alienated in this age of social networks.
- The role of ICT should be explored in all the areas. We need to realize ICT integration in all the areas.
- ICT ought to be fully deployed for aggressive action research countrywide.
- Every Minister of Education in India ought to initiate Policy formulation in respective areas realizing reflective dialogue at national level, for example, ICT Policy for Teacher Education, Health Education, Education of the Disadvantaged groups.

- e- Courses & Programs should be launched and appreciated , such as, e-B.Ed. proposed by the MKCL, Pune, B. C. Ed. & M.C. Ed. programs offered by the DAVV, Indore.
- It is high time that the ICSSR, NCERT , NCTE switch over to e-Surveys & publications. The research agenda by all the apex agencies should be made evident and public. All these agencies be advised to switch over from paper to e-mode.
- There should be e-consortiums in various areas, such as, environmental education, health education, life skills, educational skills, Human Development Index.
- The efforts of the CASE in establishing Indian Consortium of Research in Education (ICORE) are appreciable. The ICT facilitated social networks ought to be fully functional.
- The relative role of various ICT Media ought to be analytically & comprehensively defined in various areas. How Radio, TV, Computer, Internet , Satellites can contribute to the development?
- The credibility of the ICT based research ought to be established. The characteristics of the ICT based tools, techniques and approaches ought to be established.
- The research outcome ought to be widely deployed through e-News Letters, e-books, e-compendiums. All these publications should observe socially acceptable standards.
- India has the potency to create, construct & nurture the greatest form of ICT. All our quality products ought to be timely patented.
- Our ICT policy ought to be formulated on the principle of equity & equality.
- A large number of the teachers feel alienated and alone in this digital age of networking & globalization. It is because we do not have Technology integrated Education. We, the 21st Century Teachers are lost in the realm of technology. We are neither techno-savvy nor info-savvy.
- We travel through the media crowd without being sensitive to it. We need to modernize temporally, spatially, logically, epistemologically, and technologically. Technology can facilitate our transition from dot to globe and point to morphology.
- Technology is well woven in almost all walks of life. But Education is relatively technologically backward. Every teacher should put in efforts to be techno-savvy, because it is Education and Education only which can deploy and integrate technology

faithfully with a service motive. Indian Teachers are highly adaptive & highly innovative. Very willingly, and passionately they are living the technological era of information explosion & media implosion.

- How can life be a network of arrays of innumerable skills, where, ideas spring, feelings flow, motor creates, spirit reins, and the self resonates with the sphere in this digital age? We teachers need to learn what to tweet, whom to tweet, how to tweet, when to tweet. How do I value Facebook? How should I construct my Facebook? Which messages should I send via messenger? What should I SKYPE? What should I email? What should I Blog? Less Well's Model- Who, Says What, To Whom, Through Which Channel, and With What Effect needs to be employed in each communication.
- The communication has become very fast through email & g-mail. We need to exercise instantaneous communication control, because, we cannot not communicate & communication is circular & irreversible. Internet- the World Wide Web is a universal network. Innovators & Creators, Crackers & Hackers all reside here. The 21st Century Teacher has to be really perfectly fully complete to facilitate development.

c. ICT Aided Constructivist Learning Approach & Development

Reflections of the Pre-Service Teachers on ICT Aided Constructivist Learning Approach in Science (Ganiger & Goel, 2013) reveal that

- ICTACLA in Science is really innovative one, through which the teaching-learning in science has become meaningful.
- This is activity oriented and based on the principle of learning by doing. This approach is powerful both for lesson designing & transaction.
- Use of ICT in the constructivist science classes really provides scaffoldings with the earlier knowledge to make new connections.
- ICTACLA develops the creative & constructive faculties of the learners, sustaining their interest & curiosity.
- Doing experiments by the learners is a thrill of joy. Through this the complex, abstract concepts could be made more clear, simple and concrete.

- ICTACLA has been found to be very effective approach of Science Teaching & Learning.
- In some of the schools, though smart, yet the facilities of ICT were not found. It would be better that the School Education and Teacher Education institutes have the well equipped laboratories.
- Online sharing of science experiments and responding to the queries makes Science Learning very lively.
- ICTACAL teachers are self motivated & better prepared.
- ICTACLA creates such a learning environment wherein the learners can think independently and work according to their capabilities and work on own examples, so that their real learning occurs.
- Collecting, organizing, transacting the information collected through internet and integrating within the constructivist framework is really a challenging task.
- Only studying theory does not work unless it finds place for practicing it. So the theories taught in the classroom should find their expression.
- Here is no hurry for completion of the syllabus; ICTACAL covers much more than the syllabus demands.
- Preparation of teaching aids is joyful, one can think divergently.
- There is full immersion of Teachers & Learners in Science through this Approach.
- As it is problem-solving approach, we usually go by simpler to complex, concrete to abstract, induction to deduction, germination to incubation to innovation to creation and construction, which continuously sustains curiosity and passion amongst the children.
- Identifying student's interest and designing the teaching-learning activities accordingly makes all kinds of learners to learn and construct new knowledge.
- ICTACAL facilitates experimentation in natural setting realizing a natural laboratory.

The orientation program based the ICT aided Constructivist Learning Approach in science and its implementation on the Pre-Service teachers has had substantive returns. It is evident that use of ICTACLA has made the pre-service teachers confident in using this innovative approaches in teaching science. The development of the Lesson plans using 5E's and 7 E's made the Pre-Service Teachers engage themselves completely. Integration of ICT applications into the lessons,

engaging in virtual world of science, hyper linking the information with artifacts, discussing through social networking systems, evaluating throughout the classroom, emphasizing on self evaluation has demonstrated how the Pre-service Teachers could be transformed into Teaching Scientists.

d. Educational Development of the Visually Challenged

The latest predicament of our nation is the quality inclusive education for all. The realisation of quality inclusive education for the visually challenged, hearing impaired, deaf & dumb children demands careful, intensive sustained struggle. To include even a single student with a single challenge in a normal class demands a lot on the part of the education system.

The present research (Darji & Goel, 2013) attempts to study the profile of a visually challenged prospective Teacher Educator through an interview with a Teacher Educator. The interview presents the plight of the student , struggle of his parents and concern of the education and society at large for the education of the visually challenged student. It presents how his parents are awake with him beyond mid nights, read for him from the learning resources, record for him for progressive playback. Also it presents how the packages, such as, JAWS, that is, Job Access With Speech is supportive in this digital age. Radio is a blind man's medium and is meant for ears only. It plays with sound and silence where the sound can be any thing like voice or word, music and effect. Sorry to record, that Educational radio in India is either not utilised or is underutilized.

It presents the need for casting the curricula and modes of transaction for the visually challenged in the audio and digital modes through various emerging technologies. The visually challenged learners require audio support in all phases, such as, learning resources, modes of transaction and evaluation. Whether the writers in the examination for them could be substituted by some equally credible media to record. Though we propagate inclusive education for the visually challenged, yet we present the question papers to them in print form. There is a need to design a compatible education system for the visually challenged.

Emerging Views

1. As such there is no difference in the curricula for disables and non-disables. It is not and it ought not to be. The problem lies with respect to the modes of transaction of the curricula. For example while teaching in a class having visually challenged, while writing on the black board the teacher should speak also.
2. The visually challenged students ought to be provided with the subject matter in compatible forms, such as, e-form, brail form.
3. As far as English and other European languages are concerned, packages, viz., JAWS and Open-book are suitable, but, when it comes to Indian Languages, more suitable packages ought to be explored. Every visually impaired person can have access to Indian languages through listening and typing on computer, if the suitable packages are accessible.
4. The teacher and Education system ought to identify the problem of the visually challenged just in front of them. The teacher should not only visualize the content configuration , but also, they should try their level best to reconstruct the reality through spoken words to make the visually impaired persons visualize the essence of the substance.
5. Inclusive classes demand serving all the senses simultaneously equitably. Such humane and resourceful professional teachers ought to be groomed and cultured.
6. Defect by default is rarely repairable. Still, aggressive educational and social attempts should be made to share the state of the disadvantaged by all. The needs of the disadvantaged should be supplied to the fullest possible extent by all the agencies, of which parents, siblings, peers and teachers are the nearer.
7. All the functionaries of the educational institutions should identify with the disadvantaged people . Differentiated differential inputs and processes ought to be devised to meet various challenges.
8. The Learning Resources Management System should be user friendly, irrespective of the abilities and disabilities.
9. The intelligent canes/sticks/walkers should be provided to the visually impaired and orthopedically challenged.

10. Open source wares and e-resources repertoires should be made readily available to the visually challenged.
11. ICT can contribute a great deal in bridging the gaps amongst different senses, teaching styles and learning styles, learning resources and learner profile.

e. Profile of Prospective Teacher Educators on Self Awareness & Environmental Awareness

The self health hazards and Environmental hazards both are on the increase. It is Education & Education mainly which can contribute to wholistic development. In my country Education & Health, both, the twins are grossly neglected. Education is the least priority of the State. Predicaments are empty slogans. Assurance does not ensure. Medical malpractices are on the public fore. It is high time that India awakes. It is high time that the education, educators, and educated awake. It is high time that the Education, Society, State & Judiciary emerge & converge. All ministers are expected to formulate a national policy in respective domain, say, Health Education, Teacher Education, ICT in Education. We have relatively more of expectation with Education than any other agency. Education has to realize its identity. The present research (Goel & Goel, 2013) attempts to study the profile of prospective teacher educators on self awareness and environmental awareness, with a pious intent to enhance if wanting.

1. The correlation between Self Awareness and Environmental Awareness on the scores obtained by the Prospective Teacher Educators has been found to be equal to 0.1434. It means co-efficient of determination is very low.
2. The Prospective Teacher Educators need to be groomed on various facets of Self Awareness as well as Environmental Awareness, such as, follows:
 - Very often remembering sad moments rather than happy moments of life demands reversal. What ever has gone by has gone by. We need to learn to live in present. It is not worth to brood over the past.
 - Over trusting and not at all trusting others are the two extremes. Trust is a construct of many factors which need to be internalized and exercised, such as, level of concern, empathy, fellow feeling, welfare, unselfishness, openness, clean dealing, level of identification, trust worthiness.
 - Trust ought to be scientific and systematic rather than blind based. False trust is a crime. Let those Trustees seize to be Trustees who are not trustable & trustworthy.

- There is no reason to imprison the sorrows within. This biosphere becomes meaningful when both the happiness and sorrows are shared.
 - A large majority of Prospective Teacher Educators have been adversely affected by anxiety, tensions, emotions and defiance. Rather than seeking external guidance they ought to establish self talk to come out of these phobias and clouds.
 - Two of the Prospective Teacher Educators have developed the habit of procrastinating, i.e., delaying things. It can be controlled progressively through learning management.
 - Some of the Prospective Teacher Educators have been found to be highly extroverts where as some alienated & introverts. Such personalities have due scope for intervention.
 - A critical mass of Prospective Teacher Educators has reported to be backward in Mathematics, Computer Programming and Spoken English. All these discrepancies can be over powered with passion and perseverance.
 - Some of the Prospective Teacher Educators have been found to be victims of low self esteem, and low estimation. They can develop their morale by employing indigenous mechanisms.
 - A sizeable number of Prospective Teacher Educators are suffering from depression, aggression, nervousness, uncertainty of future and over sensitivity. There is a need to explore aggressively to find out what has made them regress to such a realm.
3. The Prospective Teacher Educators have been found to be reasonably aware of their strengths and weaknesses.
 4. There is a need to emulate the strengths of all the Prospective Teacher Educators.
 5. The scholars have exhibited many a creative attributes, such as, creative composition in the form of poems, narrations, dance, music, drawing, painting and cooking.
 6. Their class cohesion, roaring synergy, cultural heritage, educational identity, continuous curiosity and spontaneous respect are perceptible every moment, promising their Teacher Education Proficiency.
 7. However, the class profile of Prospective Teacher Educators has been found to be relatively wanting on natural Environment. A large majority of them have not been in a position to respond correctly on areas, namely, whether landfills are designed to help biodegradable waste decompose quickly, whether green washing is an alternative to white washing, whether Expanded Poly Styrene & Poly Propylene are recyclable, whether more than 50 million of Bangladeshis are exposed to excessive Arsenic in their drinking water, which are the green House gases, whether it takes more than 1 million

years for a plastic plate to decompose, whether acid rains cause most problems in Australia & California, which is the most beautiful, cleanest, greenest planned city in India & which one is the most polluted, how the once common sparrows are now harder to see, how the honey bees are disappearing globe over, how the fast food contributes to health, which are the endangered species, which substances are more eco friendly, What is global warming due to. It seems inspite of Environmental education as a Special area in Teacher Education, it has neither been in a position to develop environmental awareness, nor environmental ethics. Even in the 21st century the Post Graduate Students with Science background do not know the structures of many a polymers, such as, Expanded Polystyrene, PolyPropylene, Poly-Ethylene, Poly Vinyl Chloride.

8. Some of the Prospective Teacher Educators are wanting in the domains of Politics, Economics, Spiritualism, and Metaphysics.

It has been a valuable experience researching the self awareness & environmental awareness of our M.Ed. Scholars, the Prospective Teacher Educators. It was overwhelming to find the youth aware of the self strengths and weaknesses, and moreover, sharing those whole heartedly. They have been found to be socio-centric. But, largely they have been found not to be groomed into the natural, political, economic, spiritual and metaphysical environment. Their level of self awareness has not been found to be the determinant of the environment and vice-versa. Their ought to be ample inputs on environmental awareness & ethics right from nursery to higher education.

f. Research & Action Plan for Quality Teacher Education

According to Goel & Goel (2012) , the Educational Research in India is quite substantive. But, the present day researcher is lost in the mechanics of research, restricting degrees of freedom & flexibility. The research agenda is almost absent. The research priorities are arbitrarily decided. But the present day chaos in Educational research will no longer exist. Indian Education is strong enough to sustain & strengthen its identity. Here is an action plan for Quality Teacher Education.

1. It is high time for India to revive the NCTE, with full respect, to regulate the Teacher Education not to let the Teacher Education regress to void and vacuum. The Teacher Education at large has become stagnant, stale and sterile.
2. A Central University of Technology Integrated Teacher Education (TITE) ought to be established with satellite campuses in all the regions.
3. All the emerging paradigms of Teacher Education ought to observe their ethos, such as, Open & Distance Teacher Education , Integrated Teacher Education, e-Teacher Education, and of course, the F2F Teacher Education.
4. Content-Pedagogy-Technology integrated modes of Teacher Education, viz. B.A. Ed., B.Com. Ed., B.Sc. Ed., M.A. Ed., M.Sc. Ed., M.Com. Ed. need to be strengthened.

5. Innovative Programs offered by some of the Universities, namely, DAVV, Indore, Banasthali Vidyapeeth, and Lucknow University ought to be revived and further deployed.
6. Indian Consortium of Research in Education (ICORE) ought to be established to share educational research in South Asia. The sensitivity and sensibility of the apex bodies, such as, UGC be sought to such proposals.
7. It is painful to learn that the Department of Educational Research & Policy Perspectives at the NCERT has been divided into Division of Educational Research. Only God knows where the other slashed integral & integrated component of Policy Perspectives is lost. Our Educational Research ought to be with the Policy Perspectives.
8. It is high time that the ICSSR focuses on the Taxonomy of Educational Skills in the context of Indian Education.
9. Taxonomy of Educational Research ought to be arrived at. There ought to be due focus on positivism & logical positivism, Interpretative & hermeneutic, as well as, critical reality paradigms.
10. The course work made mandatory by the UGC for Ph.D. in various disciplines, including Education has resulted into mechanization of Research in India. Attempts should be made to de-mechanize research leading to innovative, creative and constructive research.
11. Could there be dedicated composite PG programs in Education, say, M.Ed. after +2 or dedicated Ph.D. in Education (B.Ed. M.Ed. & Ph.D.)? If yes, then what should be our action plan?
12. The apex agencies & institutions, such as, CASE, CIIL, HBCSE, ICSSR, NCERT, NCTE, NUEPA, UGC should decide the Research Agenda for the Nation.
13. The NCERT should sustain its Research Heritage of Educational Surveys. The Nation is expecting the next Educational Survey. It is high time that the NCERT brings out the Educational Survey in e-form, also.

g. Growth Rate of various States in India & HDI

Haryana is leading State in the country among the big States in per capita income. The per capita income of Haryana was 1,09, 227 in 2011-12, whereas, the per capita income is estimated of Rs. 1,28, 341 during 2012-13. The economic growth of the State is 9.9%, which is the highest of India. Haryana is the first State to provide safe drinking water facilities all over the State. The per capita expenditure in the State on the health services during the year 2011 was Rs. 490.28. (Hindustan Times, Delhi, Sunday, Feb. 3, 2013). Haryana was carved out of Punjab on Nov. 1, 1966. Having emerged as a path-breaker and trend setter, Haryana has traversed a great distance. But, has the State really made a tremendous growth in totality? What are the Education Index and Life Expectancy Index of Haryana State? What is the level of internal security & external

security in Haryana? What is the level of equity & equality in Haryana? What is the Human Development Index in Haryana? What is the over all State Development Index? What is the relative status of agriculture and industry in Haryana? How the GDP and HDI of the State could be enhanced? In which domains Haryana could be emulated by the other States of India and vice-versa?

Kerala State has always been excelling literacy rate. But, has the State realized sustainable development. Karnataka & Andhra Pradesh are the leading States on Information Technology implementation. But what is the Human Development Index in these States? What is the present status of Punjab on HDI which is a prosperous State? What is the status of North East of India on HDI?

It is high time for India to produce State-wise Human Development Index.

h. Health Education & Development

- Our food habits have changed. There is evident transition from home made food to fast food. It has come to the fore that these preserved foods are largely not hygienic . These usually contain excessive fats and spices and are acidic. Though the food is high calorie, but, it does not provide adequate energy, Also, the preservatives used, such as, nitrogen, chlorine, carbonic acid, vinegar and impure sugar (molasses) are harmful. Also, the refined wheat flour (Maida) consumes significantly more time for digestion. The fats overused for frying cause many a health problems. Consumers have changed their tastes as per the tastes of the producers, fair or foul. There is ocean of food stuff, but, non-compatible. What to choose? Where from?
- The entire environ is polluted, There are water pollution, air pollution, soil pollution and noise pollution. Which water to drink, which air to breathe, which vegetables & fruits to eat, and how to find noise free corner? There is environmental awareness but very rare environmental ethics. There is degeneration of environment. With the lust for luxury many a species are disappearing. Fully healthy people are no longer seen. Every one suffers from one or the other disease. What is the resolve?
- The life styles have changed. We have moved from naturalism to existentialism. We have moved from simple living & high thinking to high living & simple thinking, from health

is wealth to wealth is health. We are going far away from our heritage and culture. Truthfulness, compassion and forbearance seem to be mere slogans. We are in more of competitive societies than cooperative. The nuclear families have resulted into the alienation of children.

- We are using technology or technology is using us? We have media crowd, but, no media culture. There are many health hazards due to over use of Technology. It is high time that we become techno-savvy, info-savvy, net-savvy and media-savvy.
- Our greatest disease is passions, possessions, obsessions. There are many a medical malpractices. There is a need to realize professional ethics.
- Molls are rising in India at a rapid pace, but, we do not have moll culture. Almost every hand has cell phone, A to Z phones, but, we do not have cell culture. Only God knows what we keep communicating round the clock. We have media crowd, but, no media culture. Health hazards are self evident. Modernization & perfective maintenance ought to be there. Modernization & perfective maintenance demand precise regulatory mechanisms and controls.
- Each one of us should observe Yoga for sound health.
- We need to employ, both, preventive, and ameliorative measures for sustaining sound health.
- Health Education ought to be integrated with Educational Curricula at all levels, from pre-primary, through tertiary & continuing.
- We should observe healthy Heart & Brain entrainment Ratio.
- We should sustain our smiles and laughter under even the most adverse conditions.
- Human Development Index should be of prime importance for any nation.
- Various States in India ought to learn from the development of each other.
- India should formulate National Health Policy at the earliest.

Degenerating health of all of us in India is an alarming issue. There are many health issues in India. Neither we are fully aware of the self nor that of environment. The present article focuses on how there is a need of observing healthy heart and brain entrainment ratio. How yoga can contribute to the heart & brain entrainment ratio and sound health. The present day modern society is busy without business. We rarely find natural, continuous, spontaneous, roaring

laughter, and natural graceful soothing smiles. Let us revive our health, resonating laughters, and flowing smiles, because, it is our duty to preserve and sustain the health heritage of India. The State ought to define its role and arrive at a Health Policy for India. We need not produce a health issue repertoire, because all these issues are self evident.

Despite the policies & programs on Environment & Health, the Plants, Trees and greenery is disappearing. Children keep munching the junk food, non-stop. Adults keep drinking the tea & coffee, count-less. Over and above this “Desi Shrab Ka Theka” narrates a lot of the growth & prosperity of a State. The very presence of such contracts is ridiculing the poor innocent rural, tribal and even urban. No research rigor is required to know the health status of India. The street roads full of Pan & Tobacco spits, full of all sorts of roughage, pits & ditches reveal a lot of the Psycho-Somatic State of we Indians. Junk food, green washed vegetables & fruits, medical malpractices, all sorts of pollution and indifferent people, narrate a lot of the health of India. Could the Education, Society & State converge and reflect on the health issues? No government policies will work, unless each & every Indian is health educated & accountable. Human Development Index ought to be the priority of Indian Government.

Health issues in India are highly alarming. Despite all the preventive maintenance why do we fall sick? It is because the environment is polluted. Who is accountable? We all. Every foreign latest virus first enters in India. It is because we do not have adequate security measures. There are many a indigenous diseases born in India, Some of these have been named, the others are yet to be named. We salute all of us for our survival, because, we employ all the possible Medical Sciences, such as, Naturopathy, Homeopathy, Allopathy, Ayurved..... We need to bring about health sensitivity & consciousness. We recall age old slogan “Prevention is better than Cure.” But, how to sustain health in a suffocating environment? Health Education seems to be the best resolve. Health Education should be introduced in Educational Curricula at all levels. Let us observe environmental ethics. Medical Sciences ought to do analysis at the functional level. Medical Sciences & Medical Ethics ought to be perfected. More than the ameliorative, we require preventive measures for the full health of the masses. We should employ Raja Yoga, karma Yoga, Bhakti Yoga & Jnana Yoga as Voiced by Swami Vivekananda, and ancient Cultivation Practice of Truthfulness, Compassion and Tolerance of Falun Dafa.

Concluding Remarks

A thorough analysis of the Educational Research repertoire reveals that we have more of descriptive & evaluative research rather than suggestive, the policy research. National Problems and Research Problems are not in tune with each other. Research theses rest in the racks & carols. Research has contributed very little into the development. Technological, as well as, Philosophical & Historical research theses have rare expression at the operational level what to talk of Psycho-Social & Political. Our academic courses have the Philosophers & History, but, their philosophies & heritage rarely flow through our nerves, vessels, motors & streets. The effectiveness of technology has been well demonstrated at the laboratory level. We, the Social Scientists have largely failed to move out of our laboratories to the operational levels.

Our problems are pretty evident. A cursory look pours innumerable problems. Where is the need to establish cause & effect relationship. It is high time that in many areas we start the development with the effects, not bothering much about the causes. India is a self contained wonderful land. India knows how to nurture & develop. The curiosity & concern of the innocent creative, constructive and developing masses is recursively remarkable. It is all evident through our rich cultural heritage, decent present & promising future. India is broad enough to absorb all noises & strong enough to revolt all threats.

India has both agrarian & digital faculties, extending from dot to globe, point to morphology and earth to the sky. We are amply exploring & developing. We have seers & engineers, whose text is its own testimony and design its own perfection. We do not require patents or labels. That is the wonderful ethos of sustainable development of India.

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Research Scenario of Teacher Education in India

Chhaya Goel & Devraj Goel

Research

It is the search for Knowledge. Human beings are the unique product of their creation and evolution, Human beings began to observe the nature, universe and all cause and effect relationships, started thinking on it, raised questions, tried for searching the possible answers; this is how the Research began unsystematically. It was only when people began to think systematically about thinking the era of logic began. This approach of reasoning can attribute to Aristotle and the Greeks.

Research is includes the creative work undertaken on a systematic basis, in order to increase the knowledge. The Etymological meaning of research is derived from Middle French “recherche” this means “ to go about seeking”.

According to Creswell Research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue". It consists of three steps: Pose a question, collect data to answer the question, and present an answer to the question.

Research Scenario of Teacher Education in India

India has one of the largest systems of education in the world; teacher education is not an exception. According to the changing school context and its demands, there should be changes and developments in the teacher education system. Hence both School education and Teacher Education are symbiotic in nature. The development needs research. In India large number of research in education is the stereotypic. There are less innovations, a large number of surveys have been conducted but the generality is less found. Less research on Philosophical and Historical studies. There are mismatches between research trends & problems, there is a need to evolve research quality indicators. There are less researches on connecting the teacher education and school education, the culture for creation, construction and

incubation of ideas is missing. So altogether Educational Research needs Innovations, needs indigenous methods and needs quality research.

Is it feasible and worth to explore the existing? Yes, it is. But, it demands perspective, passion, dedication and culture. Research is mostly wanting in, both, natural and social realm. Most of the present day Science & Mathematics laboratories merely replicate than innovate. India feels proud of its past glory, but, at present Science and Mathematics, both, have lost their identities. Social Sciences are surviving on the borrowed methodology from other Sciences, which are largely not suitable. Similar is the status of other disciplines. There is a fall in our economic growth, because, our Social and Political institutions are not properly located. Our political hub, Educational hub and Economic hub all are centered in the capital. Solution to all the problems resides at Delhi. The latest creation of Indian Higher Education is Academic Performance Indicators, mostly, known by APIs amongst the Academic Community. As a result there is evident chaos in the field. Those interested in doctoral work are lost in the research course work, suitable or not, but made mandatory. Teaching is mainly text book based, not research based. Our research problems are borrowed. So is the status of research methodology. Our research product is published and marketed by foreign publishers at such a high price which is usually not bearable by us. Thanks to the “Shodh Ganga” which has recently originated in India. With the invention of Academic Performance Indicators many a e-publishers have appeared in the virtual world, with ready ISSN. Earlier the authors used to seek the publishers, now the publishers seek the authors. With the implementation of some of the recommendations of the 6th Pay Commission, in the State Universities, there is abrupt cut in the Teaching & Research Staff positions, justifying it on the bases of increase in work load. Is not it blowing the theoretical framework of teaching, mechanically. Which school of thought has recommend ed the increase in work load? Can education be purchased with coins? Bricks, stones, cement, computers and white boards do support education. Buildings do facilitate education. Machines cannot replace humans. Money cannot replace men. It is humans & humans only who can formulate and address problems. The credibility of the Cambridge Press & Oxford Press is well established. But, if we are genuinely interested in publication and dissemination, we need to strengthen the Indian Press. We need to enhance the fidelity & testimony of Indian Research & Researchers, Indian Press and Publishers. The present paper attempts to preface the present Research focusing on Faculty Crunch in Indian Education System, Philosophical Foundations, Historical Foundations, Sociological & Psychological Foundations, Expectations with respect to Teacher Education Parameters, Innovations in Teacher Education, ET & ICT in Education, Language Learning, Teaching Methods, Educational Evaluation, Environmental Education, Human Rights Education, Life Skills & Value Education, Population Education, Technical & Vocational Education, Art Education, Special Education, Educational Management & Administration, Taxonomy of Educational Skills, Research Methodology in Education, and Research Thrust in Education.

1. Faculty Crunch in Indian Education System

The Indian Education System from school to Higher Education, including IITs and IIMs is plagued by a massive manpower crunch. In school education, poor performance of big States is affecting the national picture. In the case of higher education, 42 Central Universities with sanctioned faculty strength of 16,602 have 6542 vacancies.

Fifteen IITs have 1611 vacancies against the total strength of 5092 faculty positions. Thirteen IIMs have to fill 111 vacancies out of 638 positions. Four Indian Institutes of Information Technology have almost 50% vacancy as 104 out of 224 positions are vacant. National Institutes of Technology across 30 states have 1,487 vacant of the total 4,291 positions.

Even less than a decade old Indian Institute of Science Education and Research with five branches has been afflicted with faculty crunch- 131 vacancies out of the total strength of 518.

But it is the School Education that is facing the real heat. Throughout the country there is a vacancy for 12.59 lakh teachers in primary and upper primary schools. Uttar Pradesh leads the way with 3.12 lakh vacancies against the sanctioned strength of 8.18 lakh. Bihar has not been able to fill 2.62 lakh teaching positions , whereas West Bengal has 1.8 lakh vacancies.

For its size, Chhattisgarh has 62,466 vacancies. Madhya Pradesh has 89,000 vacancies, Gujarat (11,695), Karnataka (18,253), Delhi (10,074), Andhra (15,379) and Kerala (3,013).

The consultative committee dealt with the issue of proposed national mission on teachers and teaching. The committee was told about two specific proposals by UGC on teacher training.(The Times of India, Ahmedabad, Saturday, August 4, 2012)

There is growing void & vacuum in the State Universities. Persons have been serving as temporary lecturers, Temporary Teaching Assistants year after year in the State Universities. Posts are not filled after superannuation. There is abrupt cut in the Teaching & Research positions. Even when the positions are sanctioned by the Centre there is no State concurrence. Do we really have a united Nation of united States?

Check Your Progress 1

- *What has caused massive manpower crunch in Indian Education?*
- A. *Poor manpower planning in India.*
 - B. *Poor Educational administration in India.*
 - C. *Adhocism in Indian Education.*
 - D. *All the above*

2. Philosophical Foundations

A number of studies were conducted during the recent past, on Educational Implications of the Sikh Guru Bani (Jasbir Kaur, 1998, Guru Nanak Dev University, Amritsar; Gurbal Singh, 1999, Punjabi University, Patiala), Bhagvad Geeta (Subhash Chandra Panda, 2004, Berhampur University, Berhampur; Sunita Singh, 2006, Dr. Ram Manohar Lohiya, University, Faizabad), Gram Geeta, (Shobhna Purushottam Saoji, 2006, Sant Gadge Baba Amravati Vidyapeeth, Amravati), and Hermann Hesse's Philosophy (Alka Mecwan, 2008, S.P. University, Vallabh Vidyanagar) and other Philosophers.

Doctoral studies have been conducted in India on Sankhay Philosophy, Life and Work of Dr. Babasaheb Ambedkar, Sakhi of Saint Kabir, Educational Ideas of Pandit Deen Dayal Upadhyaya and Madan Mohan Malviya, Philosophy of Mahatama Gandhi, Dev Atma, Gurudev Tagore, Teachings of Bhisma in Mahabharata, Gautam Buddha, Shri Panduranga Shashtri, Upanishad, OSHO of Rajnish, Sir Sayed Ahmed Khan, Yoga Vashishtha, Dr. S. Radhakrishnan, Shri Pandurang Athavle, Swami Vivekanand and Shri Aurobindo Ghosh, Ramakrishna Mission, Vinobabhave, Mahatama Jyotirao Phule, Chatrapati Sahu Maharaj of Kolhapur, Motibhai Amin, Maganbhai P. Desai, Guru Nanakdev Ji and Martin and Vedantic Model of Swami Rama Tirtha.

Guru Arjun Dev advocated Guru as the pivot who can lead his disciples on the path of reality. His educational thoughts are deeply rooted in Indian Tradition to acquire self realization and self manifestation. Truth, love, beauty and bliss are the four doors of the building of spiritual education. He advocated absolute purity, absolute love, absolute honesty and absolute unselfishness as the four pillars of the building of international understanding. Guruji advocated that evaluation is not the monopoly of the teacher alone. The children evaluate their work themselves.

Basically the Sikh Gurus were idealists and their philosophy comes under the terminology of idealism. But their understanding of the problems and their solutions were realistic and practical. They always worked out solutions in the context of their social, cultural, ethical, moral, political and economic nature. Sikhism is basically a

relationship of Guru (Teacher) and Sikh (Shish). Thus their philosophy of life has great relevance with respect to philosophy of education. The concepts put forth by Sikh Gurus with special reference to aims of education, curriculum, pedagogy, teacher, pupil, discipline, and teacher-pupil relationship are not merely theories but involve practical wisdom. The axiology of Sikh Gurus emphasizes on value oriented education, which is the main construct of individual's character. The trio of their value system is 'Nam Japna', 'Vand Chakna' and Kirt Karni'. The metaphysics of Sikh Gurus involves the root of reality. What is true is real and what is real is true. They suggest a honest life with complete faith in Him. Sikh Gurus being great moral and spiritual teachers emphasized the cultivation of intellectual, aesthetic, moral and spiritual values in life. In the views of Sikh Gurus, it is essential that there should be overall development of man from mental, intellectual, moral and spiritual horizon.

For a self realized soul, the entire cosmos is a manifestation of God. There is nothing more purifying on earth than knowledge. The mundane man should go through Bhagvata Gita to liberate the self from Maya. Humanism is one of the important virtues of divine life. The platonic love is real love between soul to soul. Various educational and philosophical implications of Bhagvadgita are- The status of Guru is more than that of God. A teacher with sound personality and super character is the only ideal. The teacher is a Jyot and Jyotsana which enlightens the little ones. Guru Vedvyas provided divine power of sight to Sanjay. It flags a message that a teacher should provide insight to his pupils to awaken their conscience, so that, they are in a position to discriminate between Sin and Punya, Good and Evil. Every teacher should be a Friend, Philosopher and Guide for his learners as Gita depicts through the association of Lord Krishna and Arjuna. The objectives of Education and Learning environment need to be designed in the light of Prigrah and Nigrah. Lord Krishna led the war not for the realization of his selfish objectives, but, for public welfare. The Shiksha of Gita is not for Arjuna only, but for, all times and all generations. Gita gives a shiksha of control of senses also. One can liberate oneself of Maya or illusion. Strong determination and faith are the keys to success. Karma with Bhagti has wonderful returns.

Scientific Attitude, Gender Equity, National Integrity, Respect for all religions, Cleanliness, Humbleness, Sensitivity, Punctuality, Dignity of Labour, Patriotism are some of the values identified and confirmed from preaching of Gram Geetha. The text of the National Saint Tukdoji Maharaj in the form of Gramgeeta is its own testimony, for

example, " Aggyananech Duravtey Pragati", "Dhan He Gribanche Rakt", "Shram Hi Gavachi Daulat", " Desh Dukhi Jnu Mazhechi Shareer". Hermann Hesse's Philosophy focuses on be, becoming, being and then de-becoming. Educational Philosophers are

disappearing from the Indian Scene. As a result State & Judiciary have started dictating Education.

How Philosophical foundations can be strengthened? We observe 11th of November as “National Education Day” for celebrating the Birth Anniversary of Maulana Abul Kalam Azad. Let all of us ask a basic question to our own self that to what extent we have been in a position to emancipate/Azad ourselves from caste, creed, religion, region, relation in this secular State of India. To what extent we have been in a position to have democratic socialistic dialogues? To what extent we have been in a position to integrate naturalism of Gurudev Rabindranath Tagore to realize the liberty of learner? Where does the Viveka of Swami Vivekanada flow through our Education? Where is the Statesman, and Educational Philosopher of the class of Dr. S. Radhakrishnan to enlighten us? Let us Search & Re-Search.

Check Your Progress 2

➤ *Why the Educational Philosophers & Philosophies disappearing from Indian Education.*

- A. These are more at the sermon level than at operational level.
- B. The Old Philosophers & Philosophies have gone largely obsolete.
- C. The Philosophies are beyond the psyche of the present generation.
- D. Education as a whole has fully lost its identity.

3. Historical Foundations

From “Escola Normal” during the Portuguese Goa (1841-1961) to the proposal for e-Teacher Education (2008), India is a witness to variety of Teacher Education. The credibility of classical Teacher Education is fully established. The land area, location, institutional plant, environment, objectives, curricula, learning resources, modes of transaction, evaluation modes and mechanisms, placement, renewal are talked of even today. But, there are question marks on the Present Day Teacher Education. Distance education has done the alarming harm to Teacher Education, being most deployed & diluted and least professional. Commercialization is a big threat to most of the traditional Teacher Education Colleges. None of the innovations in Teacher Education, such as, Longer period Teacher Education, Integrated Teacher Education, Personalized Teacher Education, Specialized Teacher Education could be institutionalized further. Either these have faded or are limited to the places wherefrom these originated.

There are rare Research Studies on the Historical foundations of Teacher Education.

The benefits of decentralization and autonomy were well demonstrated by Escola Normal (Richard Cabral, 2007, Pune University, Pune). A study has been reported on the origin and development of Ancient India Universities (Amar Singh, 2008, Dr. R.M.L. Avadh University). The ancient Indian Universities, namely, Takshshila, Nalanda, Vikramshila, Vallabhi, Odantpuri, Jagdalpur, Kashi, Kashmir, Mithila, Nadia, Dhara, and Kannauj have a lot to offer regarding the Profiles of Acharyas, attributes and dedication of Learners, Curricula, Modes of Transaction, Examination and Evaluation. The Autonomy of Education and Decentralization of Management were remarkable. The expertise and character of each Acharya was a focus of attention for students from far and wide. The profiles of the Dwar-Pandits and Top Administrators of the Universities are still on Records. Each Ancient Indian University was unique in specialization. **It was a Honour to be the Scholars of these universities. Each word spoken by the scholars was establishing the testimony of the text. Let us excavate the History. Even the remains have a lot to offer to the present Teacher Education.**

Check Your Progress 3

➤ *Why there is abrupt fall in the standards & quality of Indian Teacher Education.*

- A. Our norms & regulations are more idealistic than realistic. Yes/No
- B. There is least convergence amongst State, Society & Education. Yes/No
- C. We have gone blind towards our Cultural & Educational heritage. Yes/No
- D. The criteria for assessment and accreditation are too meek & mechanized. Yes/No

4. Sociological & Psychological Foundations

In this age of nuclear families we have added focus on pre-primary Education. There are rare programs on Pre-primary Teacher Education. In the age of two and a half years of a child, we are struggling with the problem of first transition from home to pre-school. Scenario of the mental state of the child, parents, teachers and the support staff needs no demonstration. On the other hand we have “Anashrit

Ashrams” for the old. There are problems of universalization of primary education. There are problems of Population Education. There are problems of adolescent education. There are problems of education at +2 stage. There are problems of medium of instruction. English language as a medium of instruction seems to be our biggest problem. There are gaps between teaching styles and learning styles. There are problems of Teacher Burnout and Rust-out. There are problems of degeneration of values and institutions. There are problems of teacher absence. There are problems of Para Teachers. Stress, strain, anxiety, tension, psycho-neuroticism are on the increase. There are problems of Education with mental, as well as, physical burden. There are problems of value conflicts and value clashes. In spite of the pious hope of all round development of personality through wholistic education our society is turning from naturalistic, idealistic, and humanistic to existentialistic and pragmatist. Higher is the administrative power one has, lower have been found the affect attributes. Social and Psychological abuse is on the increase. Value discussion models, Value Analysis Models, Value Clarification Models and Jurisprudential models have not been employed rigorously. Some studies on applied Psychology have been found to have desirable results in various areas of guidance and counseling. Attempts have been made to address learning difficulties, learning disabilities, psycho-neuroticism, problems of stress, strain, burn out, deviant behaviour. Though the effectiveness is evident in some cases, but, the efficacy needs to be studied further, scientifically.

There are wide gaps between School Education and Teacher Education. All of us are for child/ learner centered education. But even when we know that children are imperial, incorporative and develop their own theories, we go on superimposing our models on them. There are wide differences between the laboratory conditions of Teacher Education Institutions and the Field Conditions. The training needs perceived by most of the educational administrators and headmasters are related to maintaining appropriate human relations, stress management, conflict resolution and group dynamics. Students are in need of emotionally supportive teachers. Democratic environment is needed than authority and suppression. Studies on psycho-social factors of adjustment of school teachers gave a message to policy makers and administrators that all attempts should be made for the compatible placement of teachers in the context of their service place and conditions. The high professionally committed teachers have been found to have high occupational stress as compared to low professionally committed teachers. High professionally committed teachers have been found to have high job satisfaction. Various Models of Teaching, such as, CAM, ITM, and AOM have demonstrated their

effectiveness. Education Programs for enhancing emotional intelligence of student teachers were found to be successful in terms of raising the EQ levels.

There are questions on Teacher Morale. There are problems of organizational behaviour and organizational development. There are unhealthy staff constellations. There are challenges of Organizational Climate development. We teachers have wanting knowledge bases of child psychology, adolescent psychology and adult psychology. Behavioural problems are on the increase. There are value clashes. There are rare suitable inputs for the marginal groups. In this age of fast modernization there are problems of acculturation. How to realize equity, equality and excellence at the same time? There is a need to strengthen applied psychology and Modern Sociology

Check Your Progress 4

- *Higher is the administrative power one has, lower have been found the affect attributes. Reflect*

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- *List out the possible research areas in education with respect to Sociological and Psychological foundations.*

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- *What are the Social and Psychological Challenges faced by the learner from pre-school to higher education?*

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- *There are wide gaps between School Education and Teacher Education. Illustrate.*

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5. Teacher Education Parameters: Expectations

a. Field Expectance & Relevance

Doctoral studies have been reported on the Field Expectance & Field Relevance of Teacher Education Program (S. Mann, G. Shukala, Banasthali Vidyapith, 2005), Teaching Competencies Expected and practiced (Jyoti Bawane, University of Mysore, 2001). **There have been found wide gaps between the Expectations and Practice.**

b. Job Satisfaction of Teachers & Performance

Number of studies have been conducted on Job Satisfaction of Teachers and their teaching performance and Effectiveness (Dharmendra Malik, MDU, 2005; J.Kaur, KUK, 2004; K. Venketeshwara Rao, Shri Venketeshwara University, 2002; I.V.R.

Reddy, Andhra University, 2001). Job Satisfaction has also been studied with respect to Freezingness amongst Teacher Educators (M.Kumari, Gorakhpur University, 2005), values and attitudes towards teaching and teacher effectiveness (G. Singh, Punjab University, 2002). M. Verma (DAVV, 2002) conducted a study of job satisfaction of teachers in relation to Job Stressors, Role Commitment, Vocational Maturity and Social Intelligence. M.L. Sharma (PU, 2002) conducted a comparative study of Job Stress, Job Satisfaction and Adjustment of College Physical Education Teachers of Himachal Pradesh, Panjab and Union Territory Chandigarh. Studies have been reported on Job Satisfaction, Professional and Educational Interest, Creativity, Attitude Towards Teaching of Teacher Educators at different Levels of Teacher Education (M. Kaur, PU, 2001). V.P. Pal (PU, 2001) conducted a study of Job Stress, Job Satisfaction, Adjustment of Physical Education Teachers in Relation to their job placement. S. Khelai-UM (PU, 1999) conducted a study on Job Satisfaction and Job Dissatisfaction of dual factor theory in relation to personality types and self-concept of secondary school teachers of Thailand. A Mary Lily Pushpam (Bharthiar University, 1997) conducted a study on Attitude towards Teaching Profession and Job satisfaction of Women Teachers in Coimbatore. P.R. Manjula (Bhartihtar University, 1995) has done an intervention into the job satisfaction of Higher Secondary School Teachers of the Coimbatore district of Tamil Nadu State. A Hamid (MDU, 2002) conducted a study of the Accountability of Secondary School Teachers in Relation to their Job Satisfaction and Morale. B. Shrivastava (University of Lucknow, 2002) conducted a study of Mental Health, Values and Job Satisfaction among Teachers of Hindi and English Medium Schools. **A synthetic view presents that there are problems of mental health, job dissatisfaction, and job stress.**

c. Influence of Psycho- Social Factors in Teaching

Studies have been conducted on the influence of certain Psycho-Social Factors in Scholastic Achievement of B.Ed. Students (C. Manchala, Shri Venketeshwra University, 2005). S.S. Chahar (MDU, 2005) has conducted a study of teaching competency of Student-Teachers in relation to certain non-cognitive variables. S. Shaik (Shri Venkateshwara University, 2004) conducted a study of Academic Achievement and Prevalent values of DIET students in Andhra Pradesh. K. Joshi (Gujarat Vidyapith, 2003) conducted a study on the Teaching Aptitude of Higher Secondary School Teachers of Gujarat State in context of some Psycho-Social variables. N. Bhargava (Bundelkhand University, 2003) conducted a study of personality characteristics, values and SES of Pupil Teachers in relation to their attitude towards social change. G.P. Raval (Saurashtra University, 2003) conducted a study on Approaches of coping with stress factors and Teacher Performance. A Study was conducted on Social Intelligence and Teacher Effectiveness (R. Agrawal, Bundelkhand University, 2003). V. Goswami (Banasthali Vidyapith, 2003) conducted a study on Effect of Participatory Teacher Education Programs

on the Conceptual Development and Self Development of Student Teachers. G. Pareek (PU, 2003) conducted a study on the Effect of Relaxation Technique on Job Stress in relation to Blood Pressure, Hypertension and Heart Rate in Women Teachers. M.S. Chonakwar (Dr. B.R. Ambedkar University, 2002) conducted a study of personality characteristics of scheduled castes and non-scheduled castes primary teachers in relation to their classroom adjustment attitude towards teaching. K.K. Tripathy (PU, 2002) conducted a study of Role Structure and Role Stress in Relation to Work Satisfaction of Primary School Female Teachers in Orissa. Y.K. Anand (PU, 2002) conducted a study of Role Efficiency of Polytechnic Teachers and its relationship with personal and organizational characteristics. K.D. Patil (SNDT Women's University, 2002) conducted a study of Teacher Performance of Junior College Teachers in relation to some Personality Dimensions. R. Balu (SNTDWU, 2001) conducted a study of the role performance of Teacher Educators in Relation Their Profile. M. Pal (PU, 2001) conducted a comparative study of attitude of School and College Teachers Towards Creative Learning and Teaching in relation to Mental Health. A Khaleque (PU, 2001) conducted a study of Burnout in Relation to Self-Concept and Introversion-Extraversion among Elementary School Teachers in Assam. R.Rao (MSU, 2001) conducted a study- Development of an In-Service Training Program for Navodaya Vidyalaya Teachers in Meeting Students Emotional Needs. K.S. Shakunthala (Bangalore University, 2001) conducted a study of the adjustment of Secondary School Teachers in Relation to their Teaching Competency, Emotional Maturity and Mental Health. J. Kaur (PU, 2001) studied Mental Health as Related to Vocational Maturity of Male and Female Prospective Secondary School Teachers. G. Yadagiri (Osmania University, 2000) conducted a comparative study of Professional Attitudes and Teacher Effectiveness among Physical Science Teachers of Ranga Reddy and Medak districts of Andhra Pradesh. A.H. Kulkarni (Shivaji University, 2000) conducted a comparative study of Male and Female Secondary School Teachers with respect to their Personality Traits, Competency and Teaching Effectiveness. **Psycho-Social factors have largely been found affecting teaching in India adversely.**

d. Attitude Towards Teaching

S.K. Gupta (Baraktullah University, 2000) Compared Creative and Non-Creative Secondary School Pupil Teachers Of Madhya Pradesh in Relation to Values, Adjustment and Attitudes towards Teaching. D.T. Reddy (Mysore University, 2000) conducted a Critical Study of the Professional Pleasure in relation to Creativity and Change Proneness among Secondary School Teachers. D. Baland (MDU, 1999) has done an investigation into the Study Habits, Reading Interest, Attitude Towards Teaching and their bearing upon the achievement of the pre-service teachers. S. Patanrasd (SPU, 1998) conducted a study of the Attitude of Student Teachers towards the Teaching Profession and Globalization with

reference to certain variables. A.M. Reddy (Osmania University, 1997) conducted a study of the attitudinal changes among the pre-service teacher trainees towards the teaching profession. There are attitudinal changes towards the teaching profession through pre-service teacher education. Creativity and change proneness definitely contribute to professional pleasure. **Inspite of all the impeding factors there is professional commitment and favourable attitude of Indian Teachers towards teaching. The entire globe likes to emulate Indian Teachers.**

e. Classroom Teaching Effectiveness

S. Chawla (MDU, 2005) conducted a study on Interactional Analysis of Classroom Behaviour of Effective and Ineffective Hindi Teachers. R. Pareek (Banasthaly Vidyapith, 2005) conducted an analytical study of Computer Curriculum in Teacher Education Program. S. Singh (MDU, 2005) studied the effect of Classroom Questioning Behaviour Training on Teaching Competence of Student-Teachers and their Self-Concept. V. Upadhyaya (Dr. B.R. Ambedkar University, 2005) conducted a comparative study of the impact of the Teachers' Training on Self-Concept, Attitude Towards Teaching and Values in Self Financing and Government Aided Institutions. P. Mishra (KUK, 2004) conducted a comparative study of classroom verbal behaviour of Student-Teachers and In-Service Science Teachers of Secondary Schools. V. Singh (University of Lucknow, 2004) studied the effect of B.Ed. Training Program on Teaching Competency of Pupil-Teachers. L.K.M. Baburao (Andhra University, 2003) conducted a study of DIETs, CTEs, and IASEs with special reference to NPE 1986. S.P. Shukla (Gujarat Vidyapith, 2003) studied the effectiveness of Video Programs with Discussion, without Discussion, and Traditional Methods on the Achievement of Student-Teachers in context of some variables. Padmini P. Rani (Avinashilingam Deemed University, 2003) developed oral communication efficiency in English B.Ed. Trainees. R. Chandra (PU, 2002) focused on sustainable changes relevant to community and school needs in curricular input and transactional modes of elementary teacher education. A study on the effect of the learning inputs provided in Teacher Education Program on Teaching Efficiency of Teachers was conducted by A. Goel (Banasthaly Vidyapith, 2002). V. Vohra (KUK, 2002) proposed a Prospective Training Model after identifying training needs of Secondary School Language Teachers. K. Jayaramanna (Andhra University, 2001) conducted a study of teacher effectiveness in relation to work orientation and achievement of students at Primary Level. S. Devi (MDU, 2001) studied the effect of Classroom Questioning Behaviour Training Using Games on Teaching Competence and Pupils' Achievement. J.K. Suhag (MDU, 2001) has done Interactional Analysis of Classroom Behaviour of Effective and Ineffective History Teachers. M.S. Bhatt (Gujarat Vidyapith, 2001) conducted a study on Primary Education Trainees' Perceptions of Teaching. R. Balu (SNDT, 2001) conducted a study of Role Performance of Teacher Educators in Relation to their Profile. M. Singh (Dr. B.R.

Ambedkar University, 2000) conducted a study on Identification and Comparison of Language Skills for Hindi and English Teachers of Secondary School Level. D.T. Reddy (University of Mysore, 2000) conducted a critical study of Professional Pleasure in Relation to Creativity and Change Proneness among Secondary School Teachers. S. Kher (DAVV, 1999) conducted a case study on Development of Need Based Programs for Pre-Primary Teacher Education. A.K. Shrivastava (Dr. B.R. Ambedkar University, 1999) conducted a comparative study of the effect of Training on Teaching Attitude and Self Concept of various Types of Trainees under DIET Program. Baiju K. Nath (University of Calicut, 1998) developed self instructional package for secondary school Biology Teachers for their In-service Learning. H.B. Jani (Bhavnagar University, 1998) studied Secondary Education Trainees' Perceptions of Teaching. Mamta (Shri Shahuji Maharaj University, 1998) explored factors of specific training needs of Lady Teachers in Primary School. U. Sharma (MLS University, 1993) conducted a study on Crystallization of Professional Values among the Teachers of Higher Secondary Schools in Rajasthan. **A large number of Educational Instruction Interventions have been reported to be Effective.**

f. Predictors of Teaching Proficiency

G Londhe (Pune University, 2003) studied the Teaching Aptitude of Student Teachers with reference to Creativity and Teaching Competency. C. Shekhar (Bundelkhand University, 2002) conducted a Study of the Locus of Control of Pupil Teachers Admitted on Weightage of Bundelkhand University in Relation to their Future Teaching Effectiveness. D. Baland (MDU, 1999) has done an Investigation into the Study Habits, Reading Interest, Attitude Towards Teaching and Their bearing upon the Achievement of the Pre-Service Teachers. N. Kumari (PU, 1999) has conducted a study of Entrance Tests and Measurement Performance of B.Ed. Trainees as related to Psychological and Socio-Demographic variables. D.K. Diwan (MDU, 1993) conducted a study of the predictors of Academic Achievement of Student Teachers in terms of Aptitude, Attitude, Participation and Human Values. **All these studies have contributed to the knowledge base significantly, but, there is a need to work out the admission criteria into various Teacher Education Programs still systematically.**

g. Organizational Climate & Teaching

S. Awasthi (Bundelkhand University, 2002) conducted a study on Teacher Alienation, their Morale and Principal's Leadership and Institutional Effectiveness in different Intermediate Colleges on the Basis of Organizational Climate. A. Day (Bundelkhand University, 2000) studied the Teachers' Professional Values, Family Relationship and Anxiety in Relation to Organizational Climate. R.M. Ghatel (SNDT, 1999) conducted a study of Teacher Performance and Job Satisfaction of Teachers in relation to their Maturity, Locus of Control and Organizational conflict. N. Singh (Jai Narayan Unuiversity, 1999) conducted a study of Senior Secondary Schools of Jodhpur Division in terms of Organizational Health and Teachers' Attitude towards Teaching Profession and Adjustment. **There is a need to develop Healthy Organizational Climate for Effective Education.**

Check Your Progress 5

- *Do you agree that there are wide gaps between the Expectations and Practice in Teacher Education? Justify your stand*

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- *What are the sub-areas where the researches in Job Satisfaction of Teachers & Performance have been done and what is the research synthesis?*

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- *Psycho-Social factors have largely been found affecting teaching in India adversely. Support with the research base.*

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- *The entire globe likes to emulate Indian Teachers. Why?*

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- *Why there is a need of research on Classroom Teaching Effectiveness?*

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➤ *What are the Predictors of Teaching Proficiency?*

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➤ *Does the organizational climate catalyse effective education?*

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6. Innovations in Teacher Education

Teacher Education has experienced Micro-Teaching, Model- Teaching and Techno-Pedagogy. The innovation of Micro –Teaching has been institutionalized across India, Model-Teaching appeared and disappeared at demonstration level, whereas, Techno-pedagogy is in infancy. Personalized Teacher Education appeared in one form or the other (DAVV, Indore, Banasthali, Lucknow University). A large number of visitors visited these Personalized Teacher Education Programs, appreciated, but none institutionalized in their institutions. Participatory Approaches to Problem Solving have been effectively demonstrated in Classroom.

Attempts have been made by the Intel Teach to the Future in integrating ICT in Teacher Education at pre-service and in-service levels. Intel has been organizing training programs to orient the pre-service and in-service teachers with sizable inputs.

The Regional Institutes of Education of the NCERT have been offering B.A./B.Sc./Ed. and M.A./M.Sc./ Ed. integrated programs of Teacher

Education. Also, the RIEs have been offering Two year integrated B.Ed. Program. The Zakir Hussain Center of Education, Delhi University has been offering 4 year integrated program for primary teachers. A 2 year PG Diploma in Educational Technology proposed by one of the PG Departments of Teacher Education in India has been approved. Also, a two year integrated M.Ed. Program has been approved. Modular integrated Teacher Education Programs for Higher Education, and e-Teacher Education Program have been formulated by some of the institutions. Number of Innovations are evident in Evaluation, such as, Choice Based Credit System, Electronic Distribution of Examination Papers (EDEP), On Demand Testing, Automated Testing, Double Valuation, Testing of Affect Attributes. Progressively there is a shift to Total Internal Evaluation Based Semester System. Teacher Education is progressively integrating such practices in Teacher Education Curricula.

The question of formulating norms and standards arises when the institutions apply to institutionalize or replicate these innovations.

Check Your Progress 6

- *What are the contemporary innovations in Teacher Education?*

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7. ET and ICT in Education

A sizable number of studies on effectiveness of CAI developed through various computer languages employing either pre-experimental design or quasi experimental design reveal significant mean score gain from pre-test to post-test. Studies on the effectiveness of CAI reveal favorable reactions of students and teachers towards the CAI. (Prabhakar 1989; Himani 1990, Mahapatra 1991, and Adhikari 1992, DAVV, Indore; Khiwadkar 1999, Zyoud 1999, Yadav 2000, Goel

Khirwadkar Tomar Das & Joshi, 2000, Macwana 2004, Sharma 2005, Barot 2005, Pradesi 2005, and Rathod 2005, MSU; Suwanna 2004, SGU; Upadhyaya 1999, MJP Rohilkhand University, Bareilly; Sanjana 2001, MDU and Pandian 2004, DU)

There have been found rare studies on the pedagogic/techno-pedagogic analysis of the computer based educational instructional programs. These studies reveal that there should be added focus on production variables, pedagogic principles and spatial and temporal contiguity of various message forms (Patel, 2001,MSU; Chaudhari,2005, MSU).

Computer as a medium has been found to have the potency of addressing the heterogeneity in terms of variables, namely, IQ, Interest, Motivation, Language level (Zyoud, 1999, MSU).

There are rare studies on effectiveness of CALM in various modes, namely, text, graphics, text & graphics, text, graphics & music. It has been found that the composite modes may not always ensure higher level of language learning (Das, 1998, MSU).

Very few studies have been conducted on the relative effectiveness of CAI with peer interaction in mono, diad and triad (Pardesi,2005, MSU).

Attempts have been made for designing, developing and implementing computer based Learning Resources Management System (LRMS). The automated LRMS has been found definitely more effective than the manual LRMS (Beryah, 1995, DAVV).

A few studies have been conducted on the relative predictivity of various variables with respect to the criterion variable, namely, Educational Proficiency (Mishra, 1993, DAVV; Goel,2003, MSU).

A study conducted on Time Space Personnel Management System revealed that the computer based TSPM system was found relatively more acceptable and better functional than the manual TSPMS (Biswal, 1995, DAVV).

Though studies have been conducted on the automation of examination system, yet these studies find rare expression at the functional level. Teacher Education Institutions need to promote Choice Based Credit System and on demand examination (Mahajan, 1993, DAVV; Joseph, 1993, DAVV; Shinde, 1993, DAVV; Goel, 1997, MSU).

A sizeable number of teacher education institutions in India have initiated into ICT in Education either as a core course or as optional course. In spite of the impeding factors, namely, limited staff, inadequate laboratories with maintenance problems, sizeable classes, the courses have been found to realize their objectives reasonably (Goel, Das, and Shelat, 2003, MSU). A sizeable number of teacher education institutions have been found lacking facilities, such as, Internet, MS Publisher, Acrobat Reader (Goel, 2005, MSU). A few studies conducted on the use of Internet in Teacher Education Institutions revealed that the student teachers largely lack in info-savvy skills and techno-pedagogic skills (Joshi, 1999, MSU; Dhodi, 2005, MSU). Some of the teacher trainees make use of Internet for surfing, e-mail, research, core courses, special areas. But, the Internet is rarely used for web designing, reflective dialogue and outsourcing. Measures of Internet safety are rarely employed. There is a need to develop Net-Savvy Skills in Teacher Educator Trainees (Goel, 2006, MSU). Some Studies have been conducted on bridging the gaps between teaching styles and learning styles. The studies are appreciable but there is a need to conduct many more studies (Rathod, 2005, MSU). Studies conducted on language instruction through Power Point Presentations on realizing communicative and functional languages have been found to go a great way in establishing the effectiveness of learning various languages (Yadav, 2005, MSU; Rathod, 2005, MSU). There have been rare studies on developing language learning strategies and learner autonomy through weblogs. Blogs not only provide teachers with an exciting new way to approach communicative language learning, these also give students a new reason to enjoy reading and writing. Nayana Dhodi (2011) demonstrated very well how the info-savvy skills of Asking, Accessing, Analyzing, Applying and Assessing were developed in the Pre-Service Teachers of India through surfing on Cultural Heritage of India and Buddhist Heritage of India and the domains of their respective discipline methods. It is a joyful experience to travel through her doctoral Thesis experiencing various surfing skills, namely, skimming, scanning, authenticating, hyper-linking, switching, skipping culminating into educational immersion for seeking solutions. ***Educational Technology and ICT in Education have demonstrated their values. But, Technology in Education is not yet fully integrated. Technology in Education is still underutilized.***

Check Your Progress 7

- *What are the impeding factors for the integration of ICT in Teacher Education in India. Justify*

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8. Language Learning

The Communicative Interactive Constructive Approach has been found more effective than Structural Approach, whereas, Structural Approach has been found to be more effective than Grammar Translation Approach. The media supported approaches have been found to be more effective than traditional conventional approach. **Multi-lingual model of language instruction has been found to be more effective than Monolingual Model. Media Language Proficiency has been found to facilitate learning a great deal.**

Check Your Progress 8

- How the Media Language Proficiency can be enhanced in Indian Education.
 - A. More of Media Exposure. Yes/No
 - B. Development of Media Culture. Yes/No
 - C. Media Integrated Education. Yes/No
 - D. Implementation of Multi-lingual model. Yes/No

9. Teaching Methods

Study on evaluation of mathematics textbooks of V, VI, VII standards revealed that there is absence of continuity in chapters and lack of activity oriented exercises Jayshree R. Pai, 1997, MSU). Study on development of science

education in Nagaland concluded that more than half the total number of the Science Teachers (57%) were of the opinion that objectives of Science Education were not clear to them and accordingly less achievement of objectives of science education (Khriesamhalie Pienyu, 2004, Kohima). The study on the Science curriculum transaction in secondary schools of Baroda city revealed that teachers are not clear with values of Science(P.S. Umashree, 1999, MSU). Student teachers are found to be more interested in using innovative methods of teaching the language than working teachers. English language teaching at school level is found to be suffering from lack of interest and attitude (Kshamata Chaudhary, 2002, VMOU). Use of inductive thinking model to teach Science at Primary level proved fruitful in developing the reasoning ability of students(Kishorkumar K. Leuva, 2002, VNSGU).

Check Your Progress 9

➤ *How our Education System is grossly failing?*

- A. There is little correspondence amongst objectives, curricula, modes of transaction and evaluation. Yes/No
- B. We are excellent in enunciating the objectives of Education. First dilution takes place at designing curricula, next at modes of transaction of the curricula, whereas, evaluation is most diluted. Yes/No
- C. We lack educational determinism & action. Yes/No
- D. Education is the least priority. Yes/No

10. Educational Evaluation

Various studies under the section Educational Evaluation focused on remedial programs (Archana Srivastava, 2004, Vikram University, Ujjain), system of performance appraisal for teachers (Mohammad Abbas Ali, 2003, University of Mumbai, Mumbai), continuous and comprehensive evaluation (Puspanjali Pani, 2004, Utkal University, Bhubaneswar) and evaluation of teachers by students (Shrirang Baburao Kshirsagar, 2006, Pune University, Pune). Remedial programs developed to improve achievement have been found to be effective in bringing the results. Both B.Ed. Students and B.Ed. Teachers are of the opinion that Students' Evaluation of the teachers should be there, if taken positively and constructively.

N.S. Rathod (Bhavnagar University, 1993) conducted a study on Application of Item Response Theory to Criterion Referenced Testing. J.A. Ramanuj (Bhavnagar

University, 1997) conducted a study on development and standardization of Criterion Referenced Mastery Test on Surface Tension, Capillary Action, and Viscosity in the subject of Science in Gujarati. Teacher Education should provide substantive inputs on CRT, IRT, and NRT strengthen Evaluation. M. Singh (Agra University, 1994) conducted a study of the differential effect of Anxiety on Performance in Progressive and Terminal Examinations. A large majority of the candidates while taking examination are rarely normal because of the faulty examination system, be it admissions into the Educational Programs, Periodical Tests, or At End Test. Fear of Failure and Hope of Success keep disturbing the candidates. Could the Testing be personalized?

S. Meera (Avinashilingam Deemed University, 1995) has done an Evaluation of the Total Internal Assessment System in the Avinashilingam Deemed University. The Choice Based Credit System & Total Internal Evaluation are highly desirable.

K. Charate (Barkatullah University, 1993) has done an investigation into the causes of low achievement among Normal Children and attempted to design an appropriate curriculum and instructional strategies to tackle these. K.S. Vishwanathan (University of Calicut, 1997) studied the effect of Diagnostic Error Learning Strategy on the Achievement of Slow Learners of Standard IX in Mathematics. K. Bose (JMI, 1996) studied the effectiveness of Computer Programs as Remedial Strategies for overcoming certain Learning Disabilities. Neela Shelat & Anjali Mehta (MSU, 2003) have done an investigation into errors committed by students of Std. VIII in writing Gujarati. Number of attempts have been made on construction and standardization of Tests in various areas. **All these studies have definitely added to the knowledge base in the area of Educational Evaluation.**

Check Your Progress 10

- What is the relevance & value of educational evaluation?

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11. Environmental Education

Video film on Environmental Pollution was found to be effective in eliciting students' positive response (Indubala U.Singh, 1999, SGU, Surat). Teacher Educators were found to be very positive towards Environmental Education (Anu Radha, 2005, Punjab University, Chandigarh). The instructional Program on Environmental Studies facilitated the teacher in evolving teaching strategies for enhancing teacher-pupils interactions during the acquisition of process skills (N. Ramkumar, 2004, MSU, Baroda). Fr. Rayappan Irudayam, SJ. (MSU, 2006) conducted a Study on Development and Implementation of a Computer Based Multimedia Software Package to Enhance Environmental Awareness in the Students of Std. IX. **The Environmental Education needs to be institutionalized in Teacher Education very intensively.**

Check Your Progress 11

- *Produce a scenario of Environmental Education in India.*

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12. Human Rights Education

A large majority of the Teacher Educators and Teachers & Learners are not aware of Human Rights. There is progressively some awakening in the field of Teacher Education. A curriculum has been designed on human rights education for the children below the age of 14 years (Swaranaprava Sahoo, 2002, Utkal University, Bhubaneswar). The programs designed, developed and implemented on Human Rights and Child Rights have been found significantly effective (Mamata Sheth, 2007, MSU, Rucha Desai, 2007, MSU, respectively). Childhood is so tender a phase that it ought to be fully respected and skillfully nurtured to realize its full bloom. Every child is the extension of man and a promise to sustain mankind. United Nations has worked to free people from economic poverty, slavery and servitude, disease and discomfort to lead healthy, happy, meaningful and full life. There are evident gains. But these gains are in doubt. Even now some ice-lands are captured and gatekeepers appointed to issue visa. Too many people are living in fear. Under economic recession highly competent people are in fear of losing their

jobs. **Respect for human rights demands not only awareness of human rights, but also, favourable attitude towards human rights. Human Rights Education ought to be integral area of Education.**

Check Your Progress 12

➤ *What is the importance of integration of Human Right Education?*

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13. Life Skills and Value Education

Various studies in the section Life Skills and Value Education are focusing on aesthetic sensitivity, critical thinking, and value towards society, profession and family. Strategies developed for teaching critical thinking revealed that thinking approach can facilitate the student to understand and relate to the concepts through self-analysis, evaluation and judgment (Meghani, 1999, MSU). Some studies conducted on identification of deviant thinking patterns and clinical sessions thereof reveal that thinking patterns can change through counselling in a relatively short period of time. Cognitive counselling technique is useful in acquisition of desirable thinking (Goel & Joseph, 1994, DAVV). Induction program for teachers' classroom communication was found to be effective in improving interpersonal relationship, patterns of communication through transactional analysis training (Nyarondia Samuel Maragia, 2000, MSU). Gender and Religion have been found to influence value formation. Model curriculum developed for crisis management was found to be helpful in achieving results in a desired way and recommended for consideration of The NCERT, CABE and SCERT (Sainath Pandurang Shenoy, 2005, Mumbai University). Sheetal Helaiya implemented a Life Skills Program on the Pre-service teachers during 2008-2009 at the M.S. University of Baroda, Vadodara, Gujarat, India. Post-intervention scenario on the Life Skills of the student-teachers revealed that that there was a remarkable gain in their Self Awareness Skill, Effective Communication skill, Interpersonal Relationship Skill , Coping with Emotions Skill, Decision Making Skill and Problem Solving Skill. There was moderate gain in their Coping with Stress Skill, Empathy Skill, Critical

Thinking Skill and Creative Thinking Skill. Neither we fully know our strengths nor our weaknesses. Creative and Critical thinking Skills, both, in one is a rare combination. **Life Skills Education and Value Education ought to be well integrated in Education.**

Check Your Progress 13

- *Indian Students arte programmed by the schools round the clock. Our Education is mechanised & lifeless. we have, surprisingly, introduced life skills education in school curricula? Is not there a paradox? Reflect*

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14. Population Education

The urban students have been found to have significantly higher knowledge of population education than rural students. The urban teachers have been found to have higher positive attitude towards population education than the rural teachers (Pradeep Kumar Agrawal, 2002, Rani Durgavati University, Jabalpur). K. Luthra (University of Jammu, 1996) conducted a study of Population Education Awareness of Teachers Working at Primary and Secondary Levels of Education of Jammu Province. Harshavardhan (Bundelkhand University, 1995) studied the Attitudes of Rural and Urban Teachers in the context of Population Education. R.S. Dakariya (Bundelkhand University, 1993) conducted a comparative study of Population Awareness up to middle stage and the Teachers trained by DIET in Bhopal.

15. Technical and Vocational Education

Two studies were reviewed under the section technical and vocational education. Both are comparing the educational status in different locations. Regarding comparative study of technical education of India and Germany, the findings revealed that the aims and objectives of technical education in India and Germany are same, except emphasis on profession and professional training in objectives of

technical education in Germany. The vocational schools and University of applied sciences are autonomous. Vocational schools in Germany adopt Statewide common curricula unlike in India which is common nationwide (Ajit Ram Rao Thete, 1999, BAMU). Another comparative study on vocational education interests of Urdu and Marathi medium students revealed that no significant difference was found between the mean scores on the vocational interest of the Urdu and Marathi medium students. The jobs related to household and social and scientific fields were preferred by most of the girls in the sample (Rahat Sultana, 2001, BAMU, Aurangabad).

Art Education

There are rare studies on Art Education. One study reviewed under the section ‘Art Education’ is on developing Art Education Curriculum for secondary level. The study reveals that problems are existing in the education system regarding infrastructure facilities, curriculum and its transaction. Struggle for naturalism is identified as one of the psychological needs of the adolescent group. The secondary students need, not only qualified faculty to teach the subject, but also facilities, opportunities to practice. Students were found to have developed a positive attitude towards the art education curriculum developed by the investigator (Parameswaran, O.P., 2001, MSU).

Deepak John Mathew (2005, MSU) conducted a study of the Development and Effectiveness of an Instructional Strategy on Color and Form for Design Education. This is an exploratory study, which proved to be beneficial to both students and the design teachers alike.

<p><i>Check Your Progress 16</i></p> <p>➤ <i>How Art Education facilitates development of universal beings? Substantiate.</i></p>
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17.Special Education

Studies on the Mentally Retarded

M. Bharathi (PU, 1993) studied the Psycho-Social Problems of the Mentally Retarded and the role of Self-Help Groups. G.F. Deshti (1995) conducted a study on the Relative Effectiveness of Training Techniques to bring out behavioural changes amongst Mentally Retarded. Rajam Pillay (University of Kerala, 1995) studied the effect of individualized training program on communication skills and certain associated variables in the mentally retarded. M.P. Anitha (University of Kerala, 1996) conducted a study of the dimensions of Teacher Effectiveness of the Mentally Retarded. R. Lal (SNDT, 1999) conducted an experimental study on inclusion of AAC System in the curriculum of Teacher Training in Special Education and its effect on Language Development of Children with Mental Retardation. M. Mann (KUK, 2000) developed an Educational Package for the Mentally Retarded Children. M. Sharma (MSU, 2004) developed and tried out an intervention program for parents of children with Mental Retardation. R. Pandit (MSU, 2008) conducted a study on Effectiveness of Behaviour Modification Techniques in Children with Mental Retardation. R. Sinha (University of Lucknow, 1993) conducted a study on the Education for the Rehabilitation of SPASTICS: Identification of Potential Learners and Dropouts Among Cerebral Palsied (SPASTICS) Children: An Effort for Achievement of Human Potentialities.

a. Studies on Learning Difficulties

L. Chaudhari (PU, 1996) conducted a study to Assess the prevalence of Learning Difficulties Amongst High Risk Early School Children.

b. Studies on Learning Disabilities

H. Tahiliani (JMI, 1998) studied the effectiveness of Remedial Reading Program for the Learning Disable and Normal Children. A. Khanna (PU, 1999) studied the effect of Multisensory Instructional and Playway Approaches towards the remediation of Spellings in Science of the Elementary Learning Disable Children in Relation to their Anxiety, Self-Concept and Locus of Control. I.B. Chughtai (Barkatullah University, 2000) conducted a diagnostic study of Learning Disable Children in Language at Primary Stage and Tryout of the Remedial Measures. S.R. Reddy (Osmania University, 2001) conducted Training and Rehabilitation Services for the Persons with Disabilities in Andhra Pradesh. Pooja (KUK, 2004) studied the Arithmetic Error Profile of Learning Disabled Children for improving

their Arithmetic Skills. S. Devi (PU, 2004) studied the effectiveness of differential Remedial Measures to improve spellings of Fourth Graders with Learning Disabilities. M.R. Umadevi (KUVEMPU University, 1997) studied the effectiveness of a Remedial Program on improving Reading Comprehension Skills among Dyslexic Children. D. Chauhan (PU, 2004) studied the effectiveness of different Strategies for Remediating Discalculia in Primary School Children.

d. Studies on Visually Handicapped

R. J. Vyas (Saurashtra University, 1995) conducted a study of certain Personality Traits of Blind Students as compared to Sighted Students. Neelam (KUK, 1997) conducted a study of Creative Potential of Visually Impaired Students in relation to their Self-concept and Locus of Control. R.C. Mulwani (Gujarat Vidyapith, 1999) constructed and standardized a verbal group test of intelligence for the Blinds of Gujarat State for the age group 12 and above. Y. Chandra Mohan (Osmania University, 2001) studied the problems and needs of visually impaired students at Secondary Level in AP. V. Bharti (DAVV, 2001) conducted a comparative study of the food habits and appetite in relation to Nutritional Status of the Normal and Visually Handicapped children (Aged 8-12 years) of Indore District.

e. Studies on Hearing Impaired

S. Shivji (MSU, 1995) has done critical appraisal of structural and functional aspects of Organizations for Hearing Impaired in Gujarat. B.B. Pandit (Bhavnagar University, 1996) developed a Basic Vocabulary in Gujarati Language for Hearing Impaired Children.

f. Studies on Physically Handicapped

N. Satsangi (PU, 1993) conducted a study of Adjustment, Self Concept, Alienation and Altruism in Siblings of Handicapped and Normal Children. L. Gurnani (M.L.S University, 1993) conducted a study of Life Values, Personality, and Creativity of Physically Handicapped Senior Higher Secondary Students of Rajasthan. S. Kamthan (Jiwaji University, 2002) conducted a comparative study of Personality dimensions of normal and handicapped (Polio Affected) Children.

g. Studies on Autism, Deaf & Dumb

C.A. Reddy (Jiwaji University, 1993) studied the effect of Physical Education Program on Motor Behaviour and Selected Coordinative Abilities of deaf and dumb students. V. Hema Nalini (Avinashilingam University, 2005) developed Psycho-Social Pedagogic Intervention Strategies for Autism.

h. Studies on other Special Groups

H.S. Shishodia (Agra University, 1993) conducted an analysis of the Psycho-Social Aspects of Enuretic Behaviour in Children. S. Kumari Hooda (MDU, 1993) conducted a study of Special Groups of Students in Classroom. R. Goenka (Guru Nanak Dev University, 1993) conducted a comparative study of Personality and Intra-Familial Relations of Delinquents and Non-Delinquents Belonging to Different Socio-Economic Groups. M. Seth (Lucknow University, 1994) conducted a study of cognitive development in socially disadvantaged Children (Orphans). S. Acharya (Berhampur University, 1995) studied the Personality, Motivational and Cognitive competencies of Invulnerable Children. R. Mehta (MSU, 1996) conducted an Experimental Study to analyze the differential impact of Therapeutic Intervention Strategies on some Disruptive Behaviour Disorders. V.D. Bindal (Jiwaji University, 1998) conducted a study of Relationship between Family Background and Postural Defects in Primary School Boys. M.K. George (Pune University, 1998) conducted an enquiry into extent and causative factors of Educational Backwardness among the Marine Fishworkers of Kerala. Jasbir Kaur Virk (MDU, 1999) conducted a study of motivational areas of Special Groups of Students at different levels of SES and Intelligence. P.M. Thomas (University of Mumbai, 2002) conducted a study of the influence of the Teacher's Presence in Don Bosco System of Education on the development of the Personality of Students as compared to other Educational Institutions. R. Bobby (SNDT, 2002) studied the effect of Music Therapy on the Behavioural Responses of Children with Attention Deficit Hyperactivity Disorder. R. Ruhela (MJP Rohilkhand University, 2003) conducted a comparative study of Impulsivity, Locus of Control and Adjustment of Slow Learner and Normal Children. A. Varshney (University of Lucknow, 2004) studied the Cognitive Performance and Affective Disposition of School Children with Nutritional Anaemia.

i. Studies on Inclusive Education

Jagtap (Pune University, 1996) conducted a study of Integration of the Disabled Children in Mainstream Schools of Maharashtra. S. Sudarshan (

Bharathiar University, 1999) conducted a study of Issues and Challenges Encountered by the Resource Teachers, Regular Teachers, School Administrators, , Visually Disabled Children, and Non-Disabled Children in the Teaching-Learning Situations in Integrated Education Programs.

Special Education is a very challenging task. It demands full identification with the Children. Even Software, such as, JAWS (Job Access With Speech) are not readily available for the Visually Handicapped. Compatible Kits are not available with the Hearing Impaired and Organically Challenged. Designing Behaviour Modification Techniques for the Mentally Retarded is highly skillful task. Even more challenging is to treat them. Children with learning disabilities, learning difficulties, visual handicap, hearing impairment, physical handicap, cerebral palsy, anemia, autism, all need special care and treatment. Inclusive Education demands highly caring institutions, competent staff and congenial conditions. Teacher Education should make suitable provisions for all these Special Children.

Check Your Progress 17

- What are the different thrust areas of research in Special Education?

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- What are the challenges of Inclusive Education ?

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18. Educational Management & Administration

About 3.5% of the GNP in India is spent on Education. The distribution also varies from Pre-Primary Level to Tertiary Level. Research obtains the least share which is less than 1% of the GNP. A large number of Teacher Education Institutions are still being governed by traditional, conservative, bureaucratic model rather than by Human Relations Model. Mostly in the private sector, the focus of the Teacher Education Trusts is most on Finance & Market, and least on the Growth & Development of Human beings. Even by the public sector there is abrupt cut on the Teaching Faculty. Under the aegis of being public, the State supported Universities and Colleges continue to have their inflexibility and insensitivity. There are imbalances in Teacher: Learner ratio. There are imbalances in Learner: Learning Resources ratio. Which Management Theory proposes fully qualified Teacher Educators as “Shiksha Shayak Shikshak Shikshak”? Where does the public exchequer flow if not for Education?

There are problems of Management of Admissions in various Programs, Time-Space-Personnel Management, Learning Resources Management, Management of Examinations, Placement and Promotion. There are problems of Organizational Behaviour and Organizational Development. There is a wide scope for developing Healthy Organizational Climate. Post-Conventional Autonomous, Creative Leaders and Administrators are rarely appearing. Total Quality Management is a myth and figment of imagination. There are problems of teacher rust out and teacher burnout.

Unless we put in concerted efforts to produce a cadre of Educational Administrators & Managers, the Nation will keep witnessing the Judicial Activism subsuming the roles of the executive, over-action of the social activists, and displeasure of the State. We need Indian Education Service (IES) cadre Persons to guide Indian Education & Teacher Education.

Check Your Progress 18

➤ Why do we need Indian Education Service Cadre Persons? Reflect

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19. Taxonomy of Educational Skills

Ultimate aim of education any where should be to develop a complete human being. For that skills need to be developed in all the domains to live happy, productive and peaceful life. Hard skills are the core skills which are required for innovation, creation, construction, and production in various disciplines, such as, Physics, Chemistry, Mathematics, Biology, Engineering & Technology, Arts, Commerce. The various phases are sensitivity, germination, incubation, innovation, creation, construction, development and implementation, whether it is designing, production and flying of an aero-plane or sensing, creating, composing and reciting a poem, or formulating, producing, analyzing and injecting a drug, or designing, development, organization and administration of an institution. Soft Skills are needed for everyday transaction. These are required for how people relate to each other: communicating, engaging in dialogue, giving feedback, cooperating as a team member, contributing in meetings and resolving conflicts, setting an example, team-building, facilitating meetings, encouraging innovations, solving problems, making decisions, planning, delegating, observing, instructing, coaching, encouraging and motivating. To be good at hard skills usually takes smarts or IQ (also known as our left brain-the logical center). To be good at soft skills usually takes Emotional Intelligence or EQ (also known as our right brain-the emotional center).Hard skills are skills where the rules stay the same regardless of which company, circumstance or people you work with. In contrast, soft skills are self management skills and people skills where the rules change depending on the company culture and people you work with. For example, programming is a hard skill. The rules for how we can be good at creating the best code to do a function is the same regardless of where we

work. Communication skills are a set of soft skills. The rules for how to be effective at communication change and depend on the audience and the content we are communicating. Hard skills can be learned in school. There are usually designated level of competency and a defined path as to how to excel with each hard skill. Most soft skills are not taught well in school and have to be learned on the job by trial and error. Careers can be classified into three categories, careers that need hard skills and little soft skills, both hard & soft skills, mostly soft skills and little hard skills.

But, Hard Skills & Soft Skills combination is rarely found. There is less research, but, more publication, less creation but more communication, less production, but, more marketing and vice versa. Masses are lost in customary designs. Hard Skills which emerge through sound theoretical base or lead to theory, with practice, patience and perseverance having precision and perfection passionately emerge. Soft skills demand environmental sensitivity & action. Communication, transaction and transmission through the soft skills infuse life into this sphere. Here, the intent is to arrive at a combination of hard skills & soft skills. Hard and soft skills are often referred to when entering into & living a profession. While hard skills are essential to enter, it is the soft skills that facilitate professional ethics & aesthetics. To be a good personality fit for any profession we need to be quality producers, humanistic communicators, and civilized & scientific consumers.

The scholars who philosophise at doctoral level in various disciplines ought to immerse themselves in their realm fully. Education Scholars by virtue of their discipline have to be wholistic. It is evident from the idiographs that some scholars are higher on Information & Media Skills, Info-Savvy Skills, Technopedagogic skills, but lower on Yoga Skills, and Techno-Management Skills. Some scholars who are higher at Self Direction Skill and Social Responsibility Skills are lower on Techno-Living Skill. The scholar who has been found highest overall and on Adaptability & Accountability Skill, Communication Skill, Information & Media Skill, Problem Solving Skill, Self Direction Skill, Social Responsibility Skill, Human Relations Skill, Emotional Skill, Life Skill, Adjustment Skill, Human Development Climate Skill, Research & Construct Skill and Citizenship Skill, has been found relatively low on Wholistic Education Skill, Yoga Skill, Techno-Special Skill & Techno-Living Skill and inbetween on critical thinking & systems thinking and life skills. It is desirable that all the scholars have all the educational skills at the optimum level. As, a whole the skill scenario of the scholars has been found to be promising. But, there is always scope for perfection. We should be in a

position to employ any skill timely, easily, precisely and joyfully. But, how to realize this vision?

The complexities of the living conditions demand skillful persons in various dimensions of life. All the skills have their significance. Info-Savvy & Digital Skills are as important as Spiritual Intelligence and Yoga Skills. Self Awareness Skills are as important as Systems Thinking Skills. Production Skills are as important as Consumption Skills. Zooming out is as important as Zooming in. Personal Skills are as significant as Citizenship Skills. General as well as Special Skills have their own value. Research is as important as Construction. Downloading is as important as uploading. How can life be a network of arrays of innumerable skills, where, ideas spring, feelings flow, motor creates, spirit reins, and the self resonates with the sphere in this digital age? Dancing crops, flowing wisdom, enchanting music, touching songs, resonating dance, immersing verses, speaking sculptures, enlightened learners, innovative researchers, skillful scholars and creative constructors are the wonderful springs of nature.

Check Your Progress 19

- What are different Soft skills and Hard Skills and explain their importance.

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- What is the scenario of research on Soft skills and Hard skills?

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20. Research Methodology in Education

There are more of quantitative studies than qualitative. The studies are scattered and unlinked. There is lack of continuity, cumulateness and synthesis. Most of the studies are descriptive rather than preventive and ameliorative. Culture for incubation of ideas is grossly lacking, what to talk of inculcation. Statistics and Psychometrics are superimposing reality. There is a mixed scenario of Research in Education. Some of the observations are as follows:

- A large number of surveys have been conducted in Education. But, the principles of objectivity, transparency, equivalence and generality have not been adequately observed.
- In experimental research, largely the scholars move from induction to abduction to thesis to analogy to facts to theories. But inconsistent scattered researches lead us nowhere. Social laboratory is a myth and figment of imagination. It has become essential to sustain social life that the social scientists evolve their own methods.
- In case study research diagnosis of a case is as important as prognosis of its disposition. A large majority of us have become excellent in describing the problems and cases, but prognosis is lacking. Here the presage, process and product variables, all, need to be treated very carefully.
- Naturalistic enquiry which phenomenology demands needs to be conducted in an open, naturalistic, parametric setting. Because more and more are the controls in a social science laboratory, lesser and lesser is the generalization.
- Qualitative research cannot be conducted through a-priori samples only. Sampling goes on throughout research, through various sampling techniques, such as, typical case sampling, intensity sampling, critical case sampling, sensitive case sampling, convenience sampling, primary selection and secondary selection. Qualitative Research cannot be conducted through static tools and techniques, because very often the researcher employing qualitative research methodology does not have a sound theoretical base related to the reality. Theory in fact is the product of enquiry. Qualitative Research is affected by a wonderful interaction of subject and object. The object needs to be perceived as objectively and comprehensively as feasible.
- One of the basic tenets of qualitative research is awareness of one's own biases. There is a need to address diversity issues, such as, gender, race,

religion, ability, sexual orientation, and socio-economic status. The pursuit of knowledge should be conducted with sincerity and care.

- Critical theory takes as a central concern the issue of power in the knowledge context. It focuses on how and in whose interest knowledge is produced and passed on. Where are the funds floated? What is the interest? What is the return on investment?

Check Your Progress 20

- Produce a scenario of Research methodology in Education.

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- What are the ways out to develop, evolve and sustain our own research methods.

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Emerging Thrust Areas

Following are some of the emerging thrust areas in Education:

1. Integration of Info-Savvy Skills in Teacher Education
2. Integration of Techno-pedagogic skills in Teacher Education
3. Integration of Life Skills in Teacher Education
4. Establishing Norms for Teacher Education Parameters
5. Effectiveness of Reflective Dialogue on Peace and Harmony through technology enabled narrations
6. Inculcation of Values through Symbiosis
7. Exploring the possible Role of ICT for Wholistic Development of Students
8. Relative Prediction of selected variables with respect to Educational Proficiency
9. Enhancement of the Emotional Maturity of the Prospective Teachers
10. Enhancement of the Spiritual Intelligence of the Student Teachers
11. Designing, developing & implementing a Wholistic Science Education Program For School students
12. Designing, developing and implementing an Educational Program on Child Rights
13. Designing, developing and implementing an Educational Program on Human Rights
14. Status of Scholars on Educational Skills
15. Study of the correlation amongst Research Aptitude, Teaching Aptitude, Affect Attributes & Environmental ethics of Ph.D. Scholars
16. Study of the professional commitment of Teachers
17. Evaluation of implementation of CCE in the Schools
18. Diagnosis & Prognosis of the Problems of Higher Education.

19. Resolving the current issues in teacher education
20. Thematic Apperceptions of the Prospective Teacher Educators through reflective dialogue.
21. Trend Analysis through Synthesizing Educational Research
22. Problem Solving Through Participatory Approach
23. Creative Writing Through Participatory Approach
24. Identifying and developing cope up skills for 21st Century
25. Effectiveness of Digital Lesson Designs
26. Designing , Developing and Implementing Educational Open Sourcing Through e-Mode
27. Designing, Developing & Implementing e-Software for Pre-Ph. D. Testing.
28. A Study of the correlation amongst Research Aptitude, Teaching Aptitude, Affect Attributes and Environmental Ethics.
29. Designing, Developing and Implementing an Educational Program for Time Space Personnel Management.
30. Designing, Developing and Implementing a Learning Resources Management System.
31. Effectiveness of ICT aided Constructivist Approach of Science Instruction
32. A Study of observation of Right to education in the Indian Schools
33. A Study of the Teacher Education Curricula and Modes of Transaction
34. Diagnosis & Prognosis of the Problems amongst Indian Youth
35. Case Study of the depression , anxiety & tension amongst Indian Youth.
36. A Study of the convergence of State, society, Judiciary & Education on National Issues

37. Problems of bureaucratic , traditional, conservative hierarchical Higher Education in India
38. Status of Spiritual Intelligence, Emotional Intelligence and Intelligence Quotient amongst Indian Adolescents
39. Study of the status of Research & Construction Skills amongst Ph.D. Scholars in India
40. Exploring the possible role of Educational Radio , Educational Television, & EDUSAT in India
41. Meta Analysis/Synthesis of Educational research & Emerging Research Trends
42. Status of Technology Integrated Education in Indian Educational Institutions
43. A study of the Surfing Skills in Educational Institutions of India
44. Status of Realization of the Predicaments of universalization of elementary Education, vocationalization of Secondary Education, and rationalization of Tertiary Education in India
45. A study of the growing violence through viewing of the Video & Computer Games amongst Teen Agers
46. Compatibility of the Educational System in India with respect to Students with Special Needs
47. Designing, Developing and Implementing a Computer Aided System for Guidance and Councelling in Educational Institutions
48. A Study of the change in values of Indian Children through Viewing of the TV Serials
49. Designing , developing and implementing strategies for bridging the gaps between Home Language & School Language.
50. Exploring the possible role of leisure time activities in Personality Development of the Children
51. Examination of the nomenclature of elementary education & higher education in India

52. A Study of the Role played by Intel in Indian Education during the previous decade
53. A Study of the Problems of Education of the Migrating Tribal Families in India
54. Study of the Teaching Styles & Learning Styles in Indian Educational Institutions.
55. Exploring the Structure & Functions of CTEs and IASEs in India
56. Exploring the role of CIET and SIETs in Indian Education
57. A critical study of the functioning of NCERT/NUEPA/ICSSR/UGC/NAAC/NCTE/ AICTE
58. A comparative study of Teacher Education in India and other countries
59. A study of the role of AIU in Strengthening Indian Higher Education
60. A Study of the profiles of Vice-Chancellors in Indian Universities and its implications for Indian Higher Education.
61. A Study of the Profiles of Indian State & Central Universities with respect to their Profiles & Philosophies for Indian Higher Education
62. A Critical Study of the Evaluation Systems in various Educational Institutions of India.
63. Study of the Manpower Planning for Indian Education
64. Study of the Problems of unemployed educated in India
65. Effectiveness of the intervention programs for development of Educational skills amongst Indian Students
66. Study of the In-service Programs for Professional Development of the Professionals in various fields.
67. Study of the origin and evolution of ancient Indian Universities.
68. Educational implications of the emerging Moll Culture in India
69. Health hazards of the Fast Food & its educational implications.

- 70.A Case Study of the Modern Educational Institutions in India
- 71.Integration of Yoga Education & Spiritual Intelligence Skills in Indian Education
- 72.A Study of the Cultural Heritage of India
- 73.A Study of the Religious Heritage of India
- 74.Study of the Regional Languages in Indian Schools & their Educational Implications
- 75.A comparative study of the Education in Municipal Corporation Schools & International Baccalaureate Schools

Concluding Remarks

Education in India at all levels is full of problems. There are innumerable challenges. such as , Assimilating the globalization, Managing Knowledge, Continuous updating of Knowledge & Skills, Creating new age institutions, Balancing materialism and values of orient, Phantom use of Resources, Trans-planet technology stabilization, Working with multiple languages and multiple cultures, Meeting the climatic & environmental challenges, Sustaining development, Collaborative Living, Wholistic development, Developing Vocational Skills, Enhancing Communication Skills, Quality control, Removing Public Private dichotomy, Controlling Rising materialistic values, Realizing even distribution, Controlling Ecological imbalances, Fair Recognition, Valid Accreditation, Sustaining Symbiosis, Respecting Cultural Heritage, Sustaining sensitivity to the basic values, Convergence of State, Society, Education & Judiciary, Respecting Rights of all, and Transcending time, space & mind. The research focus needs to be decided very carefully.

The educational research in India is quite substantive. But, the present day researcher is lost in the mechanics of research, restricting degrees of freedom and flexibility. The research agenda is almost absent. The research priorities are arbitrarily decided. But, the present day chaos in Educational Research will no longer exist. Indian Education is strong enough to sustain & strengthen its identity.

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Researching Pioneer Competencies in India

Chhaya Goel & Devraj Goel

A researcher is one who is fully lost in quest of solutions to the problems round the clock through humanistic & scientific approach irrespective of the discomfort. A Pioneer is noblest number one innovator who identifies with the universe wholistically. A pioneer germinates, incubates, innovates, creates & constructs. A pioneer is round the clock lost in sensing, formulating and addressing developmental challenges through most innovative, creative, constructive & connectionist approaches. The intent of the present paper is mapping the competencies of the pioneers and trying to emulate these to address numerous problems so as to recreate & reform this sphere as a happy, healthy, peaceful abode for all. The focus is on recalling Nobel Laureates of India and researching pioneer competencies in India.

1. Meaning of Pioneer

The universe has revelations in many varied forms. There is no space, no spot, no dot in the universe which is problem independent, even, vacuum is in problem. How to justify the existence of every entity, their interconnection and occurrence of various phenomena? The question is that of identification with the universe. But, in this plight of identification, no thesis, how so ever, comprehensive & precise is ultimate. We are degrees of a domain & discipline. No one is perfect (100%) in internalizing the universe. The question is how big & substantive is our knowledge base? With the efforts of all the generations we still have a very little knowledge base of the universe. It is because identification with the universe demands round the clock quest, systemic wholistic systematic research with full dedication

independent of all the noises, and with capacity of understanding & connecting the interplay of many varied variables. The pioneers in various disciplines have very well demonstrated the identification. But, where do we stand in understanding the reality we are with. The reality is independent of all of us who try to investigate it. Then how a subjective investigator can have objective view of the reality? It demands infinite, rather, indeterminate arrays of abilities, capabilities, skills and competencies to reach the reality. There are various challenges & conditions which are limiting the quest. Scientific realism is too meek to capture the reality. But, there have been Sages, Wandering Ascetics, Spiritual Scientists along with Physical Scientists to provide & activate the strength & power of soul within & between us. It is true that there is only one Cause and all the rest are Effects. So, it is impossible by the effects to have intelligibility of the Cause comprehensively. But the pioneering & innovative research in the form of constructions & connections, though very limited, but is enlightening.

2. Pioneer Competencies

Pioneer is a quintessential recluse, that is, unique excellent innovator, who tends to be close to the creator on the object of quest. Germination, Incubation, Innovation, Creation, Construction and Connection are the essential attributes of a Pioneer, who is lost in the quest round the clock, with positive attitude despite all discomforts.

The marvelous mysteries & deep secrets of the nature are revealed when a Researcher is fully lost in the quest. It is in tune with Swami Vivekanand Vision & Determination that “Arise, Awake & Stop not till the Goal is Reached”. The ultimate goal is a perfect becoming with Skill, Scale & Speed, Constructivist, Connectionist & Naturalist, proud of thy creation, always humble, a wholistic being, an embodiment of the soul, having perfect entrainment of heart, brain, senses, motor- muscles, resonating self with the environ, a universal being with unconditional eternal love & affection for all, mostly roaring, a blissful being, transcending time, space & mind to be one with the sole Soul. A Pioneer is a curious, determined, dedicated, committed, eternal scholar with a unique profile. Nobel Laureates may not be roaring IQ, but they are highly goal oriented dedicated people who fully strive for finding the truth & reality.

3. Attributes of Nobel Laureates of India:

- 1) They have a passion & dedication, JAJBA & Perfect Immersion of Life.
- 2) Their Goals are not degree of Degrees, but 100% Empathy with Painful to filter Pain.

- 3) They believe in simple living and high thinking.
- 4) They fully identify with the objects of their quest.
- 5) All of them are universal becoming.
- 6) They are intensively connectionists.
- 7) They have a wonderful sense of sensitivity & skill of scanning.
- 8) They try their levels best to transcend Time-Space-Mind & Self.
- 9) They are fully lost in the realization of their goal, regulating, both, the in vivo & external.
- 10) They rarely aspire for awards & rewards.
- 11) Their acts & texts have own testimony.
- 12) They realize quality & perfection with every bit of action.
- 13) They live alone in & with the crowd.
- 14) They are goal oriented round the clock.
- 15) They try to set all the systemic parameters with them in perfect resonance.
- 16) Irrespective of the disciplines they are identified with, they are ultimately Spiritual Scientists.

How to research the Pioneer Competencies is beyond the conceptual framework, theoretical framework, propositions, methodology, tools & techniques of the investigators with limited knowledge base.

a. Rabindranath Tagore



Rabindranath Tagore, India's popular poet and writer was awarded Nobel Prize for Literature in 1913 for his "Geetanjali" a collection of his poems.

"Our passions and desires are unruly, but our character subdues these elements into a harmonious whole. Does something similar to this happen in the physical world? Are the elements rebellious, dynamic with individual impulse? And is there a principle in the physical world which dominates them and puts them into an orderly organization?"

b. C.V. Raman



Chandra Shekar Venkata Raman, Indian Scientist was awarded Nobel Prize of Physics in 1930 for his "Raman Effect" related to light.

In 1922 he published his work on the "Molecular Diffraction of Light", the first of a series of investigations with his collaborators which ultimately led to his discovery, on the 28th of February, 1928, of the radiation effect which bears his name ("A new radiation", Indian J. Phys., 2 (1928) 387), and which gained him the 1930 Nobel Prize in Physics. Other investigations carried out by Raman were: his experimental and theoretical studies on the diffraction of light by acoustic waves of ultrasonic and hypersonic frequencies (published 1934-1942), and those on the effects produced by X-rays on infrared vibrations in crystals exposed to ordinary light. In 1948 Raman, through studying the spectroscopic behaviour of crystals, approached in a new manner fundamental problems of crystal dynamics. His

laboratory has been dealing with the structure and properties of diamond, the structure and optical behaviour of numerous iridescent substances (labradorite, pearly felspar, agate, opal, and pearls). Among his other interests have been the optics of colloids, electrical and magnetic anisotropy, and the physiology of human vision.

c. Har Gobind Khorana



Dr. Hargobind Khorana, India's Doctorate in Chemistry was awarded Nobel Prize for Medicine in 1968 for his study of the Human Genetic Code and its role in Protein Synthesis.

Har Gobind Khorana also known as Hargobind Khorana (January 9, 1922 – November 9, 2011) was an Indian-American biochemist who shared the 1968 Nobel Prize for Physiology or Medicine with Marshall W. Nirenberg and Robert W. Holley for research that helped to show how the order of nucleotides in nucleic acids, which carry the genetic code of the cell, control the cell's synthesis of proteins. Khorana and Nirenberg were also awarded the Louisa Gross Horwitz Prize from Columbia University in the same year. Khorana was the first scientist to chemically synthesize oligonucleotides.

d. Mother Teresa



Mother Teresa, a Yugoslavian nun who became an Indian citizen was awarded Nobel Prize for Peace in 1979 for her service through her Charitable Mission "Nirmal Hriday" at Calcutta to people suffering from Leprosy and to those people dying in destitute.

Mother Teresa had first been recognised by the Indian government more than a third of a century earlier when she was awarded the Padma Shri in 1962 and the Jawaharlal Nehru Award for International Understanding in 1969. She continued to receive major Indian awards in subsequent years, including India's highest civilian award, the Bharat Ratna, in 1980. Her official biography was written by an Indian civil servant, Navin Chawla, and published in 1992.

On 28 August 2010, to commemorate the 100th anniversary of her birth, the government of India issued a special 5 Rupee coin, being the sum she first arrived in India with. President Pratibha Patil said of Mother Teresa, "Clad in a white sari with a blue border, she and the sisters of Missionaries of Charity became a symbol of hope to many – the aged, the destitute, the unemployed, the diseased, the terminally ill, and those abandoned by their families.

e. **Subramanian Chandrashekar**



Dr. Subramanian Chandrashekar, an Indian Astro-Physicist was awarded Nobel Prize for Physics in 1983 for his theory on white dwarf stars' limitation known as 'Chandrasekhar Limit'.

He wrote that his scientific research was motivated by his desire to participate in the progress of different subjects in science to the best of his ability, and that the prime motive underlying his work was systematization. "What a scientist tries to do essentially is to select a certain domain, a certain aspect, or a certain detail, and see if that takes its appropriate place in a general scheme which has form and coherence; and, if not, to seek further information which would help him to do that." Chandrasekhar developed a unique style of mastering several fields of physics and astrophysics; consequently, his working life can be divided into distinct periods. He would exhaustively study a specific area, publish several papers in it and then write a book summarizing the major concepts in the field. He would then move on to another field for the next decade and repeat the pattern. Thus he studied stellar structure, including

the theory of white dwarfs, during the years 1929 to 1939, and subsequently focused on stellar dynamics from 1939 to 1943. Next, he concentrated on the theory of radiative transfer and the quantum theory of the negative ion of hydrogen from 1943 to 1950. This was followed by sustained work on hydrodynamic and hydromagnetic stability from 1950 to 1961. In the 1960s, he studied the equilibrium and the stability of ellipsoidal figures of equilibrium, and also general relativity. During the period, 1971 to 1983 he studied the mathematical theory of black holes, and, finally, during the late 80s, he worked on the theory of colliding gravitational waves.

f. Amartya Sen



Dr. Amartya Sen, an Indian Professor in Economics was awarded Nobel Prize for Economics in 1998 for his work in Economic Theory related to Poverty, Democracy, Development and Social Welfare.

“The curriculum of the School did not neglect India’s cultural, analytical and scientific heritage, but was very involved also with the rest of the world. Indeed, it was astonishingly open to influences all over the world, including the West but also other non-Western cultures, such as, East & South-East Asia (including China, Japan, Indonesia, Korea), West Asia and Africa. I remember being quite struck by Rabindranath Tagore’s approach to cultural diversity in the world (well reflected into our curriculum), which he had expressed in a letter to a friend: “Whatever we understand and enjoy in human products instantly becomes ours, wherever they might have their origin....Let me feel with unalloyed gladness that all the great glories of man are mine”

g. Venkatraman Ramkrishnan



Venkataraman Ramakrishnan, an Indo-American has shared Nobel Prize for Chemistry along with a co-American Thomas Steitz and Ada Yonath of Israel in 2009 for mapping ribosomes, the protein producing factories within cells at the atomic level.

Ramakrishnan was born in Chidambaram in Cuddalore district of Tamil Nadu, India to C. V. Ramakrishnan and Rajalakshmi. Both his parents were scientists and taught biochemistry at the Maharaja Sayajirao University in Baroda. He moved to Baroda in Gujarat at the age of three, where he had his schooling at Convent of Jesus and Mary, except for spending 1960–61 in Adelaide, Australia. Following his Pre-Science at the Maharaja Sayajirao University of Baroda, he did his undergraduate studies in the same university on a National Science Talent Scholarship, graduating with a B.Sc. degree in Physics in 1971.

In a lecture in January 2010 at the Indian Institute of Science, he revealed that he failed to get admitted to any of the Indian Institutes of Technology or the Christian Medical College, Vellore, Tamil Nadu.

Immediately after graduation he moved to the U.S.A., where he obtained his PhD degree in Physics from Ohio University in 1976. He then spent two years studying biology as a graduate student at the University of California, San Diego while making a transition from theoretical physics to biology.

Ramakrishnan began work on ribosomes as a postdoctoral fellow with Peter Moore at Yale University. After his post-doctoral fellowship, he initially could not find a faculty position even though he had applied to about 50 universities in the U.S.

He continued to work on ribosomes from 1983-95 as a staff scientist at Brookhaven National Laboratory. In 1995 he moved to the University of Utah as a Professor of Biochemistry, and

in 1999, he moved to his current position at the Medical Research Council Laboratory of Molecular Biology in Cambridge, England, where he had also been a sabbatical visitor during 1991-92.

In 1999, Ramakrishnan's laboratory published a 5.5 Angstrom resolution structure of the 30S subunit. The following year, his laboratory determined the complete molecular structure of the 30S subunit of the ribosome and its complexes with several antibiotics. This was followed by studies that provided structural insights into the mechanism that ensures the fidelity of protein biosynthesis. More recently, his laboratory has determined the atomic structure of the whole ribosome in complex with its tRNA and mRNA ligands. Ramakrishnan is also known for his past work on histone and chromatin structure.

h. Kailash Satyarthi



The Nobel Peace Prize will be awarded to educational rights campaigners from Pakistan and India, the Nobel Committee has announced. Malala Yousafzai and Kailash Satyarthi share the 2014 award.

The Nobel Committee announced on Friday that Malala Yousafzai and Kailash Satyarthi had jointly won this year's Peace Prize. They will receive the award in a ceremony in Oslo on December 10, the anniversary of the death of industrialist Alfred Nobel, who founded the award in his 1895 will.

"The Norwegian Nobel Committee has decided that the Nobel Peace Prize for 2014 is to be awarded to Kailash Satyarthi and Malala Yousafzai for their struggle against the suppression of children and young people and for the right of all children to education," the jury said.

Yousafzai, now 17, is a schoolgirl and education campaigner from Pakistan who first rose to prominence through her BBC blog advocating greater access to schooling for girls in Pakistan. In October 2012, she was shot in the head on her school bus by an attacker who had asked for her by name.

The committee said that the other winner, Satyarthi, had maintained the tradition of Mahatma Gandhi and headed various forms of peaceful protests, "focusing on the grave exploitation of children for financial gain."

The life and work of Mr. Kailash Satyarthi is synonymous to the never-ending crusade against child slavery. Born in 1954 in Vidisha district of Madhya Pradesh, a state in central India, he has a degree in electrical engineering and a post-graduate diploma in high-voltage engineering.

While teaching as a professor in a college in Bhopal, Mr. Satyarthi decided to work more actively for social change. Along with a set of friends, he founded Bachpan Bachao Andolan (BBA) in 1980. BBA (Save the Childhood Movement in English) symbolizes the struggle against child labour and child servitude. The organization is also the initiator of the first regional South Asian people's movement, the South Asian Coalition on Child Servitude (SACCS), a conglomeration of more than 750 civil society organizations. Till date, BBA team has led to the rescue and withdrawal of over 77,328 child bonded labourers and developed a successful model for their education and rehabilitation.

In 1998, Mr. Satyarthi organized the Global March against Child Labour (GMACL) across 103 countries with participation of over 7.2 million people and 20,000 civil society organizations. It is the largest peoples' campaign on child labour that led to ILO Convention 182 on the worst forms of child labour. It has been successful in the formation of the Global Task Force on Child Labour and Education, which is a working committee of UN agencies and GMACL for policy coherence and concerted action on child labour elimination, education for all and poverty alleviation.

Global Campaign for Education (GCE) – The education initiative led by Mr. Satyarthi is the coalition of civil society networks, foundations and teachers association campaigning for the implementation of Dakar goals of 'Education for All (EFA)' through international advocacy and lobbying work.

As an analytical thinker, Mr. Satyarthi has been the pioneer advocate of the now established 'Triangular paradigm of development' interlinking child labour elimination and poverty eradication with education for all. He is combating the use of child labour by creating domestic and international consumer resistance to products made by children in bonded labour. In 1994, he started "Rugmark", a social labeling program in which rugs are labeled and certified to be child-labour-free by factories that agree to be regularly inspected.

He has promoted the empowerment of children through the formation of Bal Mitra Grams (Child Friendly Villages). The concept of 'Bal Mitra Gram' is an innovative approach towards total elimination of child labor and universalization of education. Children's village council has evolved to enhance community awareness and participatory democracy and has been an unprecedented success.

"The Nobel Committee regards it as an important point for a Hindu and a Muslim, an Indian and a Pakistani, to join in a common struggle for education and against extremism," said Thorbjørn Jagland, the head of the Norwegian Nobel Committee.

"It has been calculated that there are 168 million child laborers around the world today. In 2000, the figure was 78 million higher. The world has come closer to the goal of eliminating child labor."

Chancellor Angela Merkel's spokesman Steffen Seibert wrote on Twitter that the award was a "great encouragement for everybody who fights for children's rights," offering congratulations to both winners.

4. Problems Addressed by the Pioneers

There are many developmental challenges of India, such as , Assimilating the globalization, Managing Knowledge, Continuous updating of Knowledge & Skills, Creating new age institutions, Balancing materialism and values of orient, Phantom use of Resources, Trans-planet technology stabilization, Working with multiple languages and multiple cultures, Meeting the climatic & environmental challenges, Sustaining development, Collaborative Living, Wholistic development, Developing Vocational Skills, Enhancing Communication Skills, Quality control, Removing Public Private dichotomy, Controlling Rising materialistic values, Realizing even distribution, Controlling Ecological imbalances, Fair Recognition, Valid Accreditation, Sustaining Symbiosis, Respecting Cultural Heritage, Sustaining sensitivity to the basic values, Convergence of State, Society, Education & Judiciary, Respecting Rights of all, and Transcending time, space & mind. There is infinite universe & beyond yet to be explored. India which has had the grace of being contented, peaceful, healthy, happy, beautiful, cultured society is moment by moment losing its natural bliss & beauty. We have become insensitive to our Indian Heritage of peaceful struggle. Each one of us needs to recreate, revive and refresh ourselves wholistically to value our heritage and build a Strong, Powerful, Cultured, Dedicated, Gracious and Pioneer India.

5. Developing Pioneer Culture

Developmental Challenges demand Pioneers with interdisciplinary competencies. How long will we compromise with the fragmented research? Should not it be wholistic? Why the Scientists have not come out of the laboratories? Is not there a need to conduct naturalistic situational research through deep observation, reflection & intuition and construct grass root

theories, addressing our problems, through our tools, through our sources & resources, to better our quality of life & living?

Indian brain is highly evolved, Indian artists, scientists, scholars, technocrats, researchers, and industrialists, as well as businessmen all are quality service oriented in their core. There are pioneers and pioneers in India. But, we are more used to the foreign molecules in most of the domains where as the India molecules wait for years together to be patented. We have more craze for the extraneous at the cost of indigenous. Our apex institutions are mad after the foreign products. Papers published in the foreign journals are better Academic Performance Indicators (APIs).

1. There should be healthy relationship between State, Society, Judiciary & Education.
2. We should learn to love the indigenous.
3. Minimum 5% of the GDP should be spent on Education.
4. Minimum 2% of the GDP should be spent on Research.
5. We should learn to manage with the minimum essential.
6. There is rare, rather, no concurrence of the State Governments to the new Projects and Positions sanctioned by the Central Government, to own these after the initial Project Period. This indifference of the State Government is a countrywide phenomenon which is evident through the treatment of almost all the States. Then, why not Education be shifted from the concurrent list to the central list.
7. The creativity of the budding scholars ought to be incubated in the Indian Schools. There should be capable teachers & congenial culture to facilitate the innovations.
8. There should be Research Culture in Indian Institutions. How long we will go on duplicating, replicating & stereotyping?
9. We ought to learn to value the indigenous.
10. Facilities should be created at National level for providing clinical trial. The institutions should fund patenting.
11. Facilities should be provided for patenting and scale production of the valuable products and their marketing.
12. Scientists should move from the laboratories to the operational level.
13. There should be university industry interface for developing research culture and ambience.
14. National meet of Researchers in various disciplines should be the integral feature of Indian Higher Education.

15. We should learn how to showcase and deploy to the operational level.

16. Indian Scholars & Scientists should earn respect. What are we busy with, if we don't create even the minimal facilities to live in India, that we Scientists have to seek shelter abroad?

Most of our institutions are busy imitating & duplicating. There is rare expression & appreciation of the innovative. We are mad after trying to superimpose common university act. There is no appreciation for the uncommon & differential. Even the so called Choice Based Credit System is based on the limited choice out of the given, than out of the desired.

A Nobel Laureate of India finds recognition after 84 Years. There is a need of revamping India. What use are the National Curriculum Frameworks for Education & Teacher Education if these are resident in Papers only and have failed to find expression at the field level. Originality & Creativity demand peaceful & healthy ambience. Unless we Indian learn to respect the indigenous, and develop a compatible culture we will fail to have noble laureates. There is a lot of awakening amongst Indian pioneers not to let their efforts go waste. It is high time that we learn to appreciate the passion and round the clock dedication of these pioneers.

Do we have even a single Universal University in India? We have Central Universities. We have State Universities. We do have deemed to be universities. Identity of a university is "Universal Outlook & Universal Inlook". Our Universities should give a feel of universities in terms of their act, vision, mission, structure, functionaries & functions. Indian Higher Education ought to revive and establish its identity as Higher Education. Face validity of a university be assessed on the basis of Pioneer Tendencies & Competencies.

It is really surprising to learn someone else telling our problems. Let us learn to identify & identify with our problems and address these indigenously. We need to be smart scientific humanistic cheerful players. Let us learn how to drop, how to place, how to smash, how to spin & return spin, how to full toss & bat full toss, how to throw, how to dribble, how to scoop, how to hit, how to kick, how to sublime, but, above all, let us learn how to play cheerfully, fairly, joyfully, and meaningfully. Indians are blessed with addressing any problem, physical or metaphysical. Let us exercise & realize our potentials. India will have to revive its cultural heritage and modernize socially, logically, scientifically, technically and

transcend space, time & mind to realize its status of *JAGATGURU*. For that let us learn to activate & respect the *self*.

There are problems of Bipolarity & Peace in India. Most of our feature films and TV Serials focus on these. Unless we learn to adore Nature as Source, Peacefully, we cannot be Nobel Laureates. There is no parallel to Indian heritage, ethos, values & culture. Let us Search & Re-Search and find our own selves & basic culture through our Pioneering Striving. Where are we lost? We ought to find our own selves.

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Scenario of Teacher Education in India

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Introduction

Teacher education means programme of education, research or training for human resources, equipping them to teach at pre-primary, primary, secondary, senior-secondary stages of school education, non-formal/adult education and correspondence education through distance mode. Teaching is one of the oldest and most respected profession and the roles, functions and preparation of teachers undergo changes from time to time. The most important contribution of ancient India not only for India but also for the world is in the field of education. It may also be remembered that education is not an abstract term. It is manifested in the cultural economic, individual, philosophical, scientific, social and spiritual advancement. In other words, education is the means for developing the mind for the betterment of the individual and society.

1. Teacher Education in Vedic Period

• The Vedic Period (From B.C. 1000 to B.C. 600):

In ancient Indian literature of the Vedic period the words "Siksha" and "Adhyapana" frequently occur. "Siksha" means to learn to recite. In Vedic period education consisted of learning to recite the Holy text. The word 'Adhyapana' which literally means 'to go near' implies the idea of pupils going to some teacher for education.

The ancient Indian education emerged from the Vedas, because the Vedas are the source of Indian Philosophy of life. Veda means knowledge. During this period education was divided into two kinds of knowledge this worldly and other worldly. This worldly education dealt with the social aspect, whereas, the other worldly education

was related to intellectual pursuits for achieving salvation. The basis of Indian culture lies in the Vedas which are four in number – Rigveda, Samveda, Yajurveda, and Atharavaveda.

- **Sources of the Vedic Age education: Vedic Literature**

No study of the source of Indian culture, education, philosophy and thought is complete without an adequate acquaintance and understanding of the 'Vedic Literature'. The Vedic literature represents the most important and intrinsic part of life of the India people.

- **The Vedic literature consists of the following**

- 1) Four Vedas
- 2) Six Vedantas
- 3) Four Upvedas
- 4) Four Brahmanas
- 5) One hundred and eighty Upanishads
- 6) Six systems of philosophy
- 7) Bhagwad Gita
- 8) Three Smritis

- **Aims, Ideals and Objectives of Vedic Education**

The main objective of Vedic education was the development of physical, moral and intellectual powers of man and to achieve salvation through it. In the field of salvation much emphasis was laid on attention, concentration and yoga. Man's effort was to lift self above everything through these methods.

1. Ultimate objective as moksha or self-realisation

Ancient Indians believed that education should prepare and individual in such a way as to prepare him to attain the objective of liberation, i.e. to be one with the almighty and to be free from the cycle of births & deaths. In ancient days the life of man was simple and pious and was full of religious feelings, ideas and ideals. As man had a moral standard before him, he performed his duties with great attention and devotion.

2. Infusion of Piety & Religiousness

In ancient India religion played a prominent part. Education aimed at the infusion of piety and religiousness in the minds of the pupils. Education for the future existence was blended in due proportion to achieve spiritual elevation. The main purpose was to enable the individual to awake and arise from the deep slumber of the worldly illusion.

3. Education for worldliness

Vocational aim: Happiness in other world was given more stress than the happiness in this world. This world according to them, was unreal & full of fetters. The highest wisdom was a release from these betters.

4. Preservation and Spread of Ancient Culture

Preservation and transmission of ancient Indian culture was one of the aims of ancient educational system. Renowned and devoted teachers were engaged in teaching work. Pupils were prepared not only for this life. Education for the future existence was blended with it in due proportion. In this system students practiced education independently and this helped them in the upliftment of their future life. The preservation and promotion of national culture and heritage was also stressed. "The services of

the whole community were conscripted for the purpose of the preservation of the Vedic literature. Every person had to learn at least a portion of his sacred literacy heritage." A section of Brahman as had to devote the whole of their life to the cause of learning to commit the Vedas to memory in order to ensure preservation.

5. Character formation

Education must from character. Mere intellect was not of worth if the person was devoid of not much morality. Morality or the right behavior was the higher "Dharma". Education was regarded as a means of inculcating values such as strict obedience to elders, truthfulness, honesty and temperance. Gurukulas were established with the aim of character formation. This system lacked pleasures, comforts and luxuries. Simple food, good behaviour and high ideals were constantly stressed.

6. Development of all round personality

Ample opportunities were provided to the pupils for the multi-dimensional development of their personality. They had their own methods of work in order to achieve it. Ancient Indians believed that personality should be developed through education. Physically, mentally and moral personality were developed by residing at their preceptor's home through their devotional service. Personality was developed through the following methods:

- (a) Self-restraint
- (b) Self-confidence
- (c) Self-respect
- (d) Discrimination and judgement

7. Stress on Social duties

A student was not to lead self-centred life. He was to perform his duties, such as a son, a husband, a father & many other capacities conscientiously and efficiently in the society. His wealth was not for his own sake as for his family, he must be hospitable and charitable. All professions laid stress on civil responsibilities. Inculcation of social and civic duties was one of the aims in Vedic period. Pupil's main duty was to observe the norms set by the society. They became the part and parcel of the society and were required to perform their duties towards family members. Their daily routine was to perform social, national and parental services.

8. Promotion of Social Efficiency and Welfare

The promotion of social efficiency & welfare was an equally important aim of education. Education was not imported simply for the sake of culture or for the purpose of developing mental powers but for the purpose of training every member of society in the profession which he expected to follow. Society had accepted the theory of division of work which was later on governed by the principle of heredity. Each family trained its children in its own profession. The purpose was to make each individual society efficient.

- **Main features of the Vedic Education**

1. Free education in Ancient India

In ancient India teaching was considered to be holy duty which a Brahman was bound to discharge irrespective of consideration of the fee teacher were expected to devote their lives to the cause of teaching in the missionary spirit of self-sacrifice, and the society laid down the principal that both the public and state should help the learned teachers & educational institutions very liberally.

Society realized that "Vidyadana" or the gift in the cause of education was to be the best of gifts, possessing a higher religious merit than even the gift of land. On the occasion of religious feasts, students and teachers were invited and donations were given liberally.

2. No state control on education

Rulers of the country had very little directly to do with education. It was a private affair of the people managed entirely by Brahmins.

3. High status of Teachers

Teachers were a highly honoured class-honoured by even by kings. Kings rose from thrones to receive great teachers such as Narada, Vashishtha and Vishwamitra.

4. Knowledge

Education is knowledge. It is man's third eye. This aphorism means that knowledge opens man's inner eye, flooding him with spiritual and divine light, which forms the provision for man's journey through life.

5. Teachers as Parents

Teachers behaved as parent to their pupils and pupils behaved as the members of the teachers' family. The attitude of the pupil was to be one of complete submission. As the pupils were residing in the house of the Gurus, they were begging alms for their own subsistence and also for the preceptor. This practice of begging alms by the pupils was to inculcate in them noble sentiment of humanitarian virtues. The motive behind this system was to sublimate the unruly passions and ego in the pupils, which enabled them to face the realities of life and helped in social integration.

6. Residential Schools

Teachers and pupils lived together and so they identified themselves with one another. The pupils' residence in teachers' house helped them to develop social contacts. It was considered a

sacred duty on the part of the pupils to collect fuel-wood, supply water and do other household odd jobs for the teacher. In this way the pupils were receiving instructions related to domestic life and also learning the concrete lesson of the dignity of labour and social service. Besides, the pupils of ancient India were receiving valuable training in the occupations of animal husbandry, agriculture, dairy farming, etc. by grazing the cows of the Guru and serving him in various ways.

7. Vocational as Immediate aim

Vocational: The immediate aim of education, however, was to prepare the different casts of people for their actual needs of life. In this system of education, emphasis was given not only on book learning and providing basic knowledge but on application of knowledge in everyday life. So the scope of education was very comprehensive and wide. For the development of vocational efficiency, healthy, positive attitude and dignity of labour were fostered in pupils since the very beginning of their study. They were trained to earn their living according to their abilities and power.

8. Curriculum

The subjects of instruction varied according to the vocational needs of the different castes from the Vedas and Vedangas in case of Brahmanas, to the art of warfare in the case of Kshatriyas, and to agriculture and trade, arts & crafts in the case of Vaishyas.

9. Methods of Instruction

The methods of instruction generally consisted of recitation by the teachers and repetition by pupil, followed by explanation by the teacher, questioning by the pupil, and discussion between the teacher and the pupil. Debate and Discussion, Story-telling was also adopted according to need.

10. Individual teaching

Pupils were taught individually not in masses by the class method.

11. Method of study

The method of study consisted in listening to the teacher, reflection on what has been listened to and its constant revision and discussion.

12. Role of Travel in Education

Travel was regarded as necessary to give a finish touch to education.

13. Sanskrit as the Medium of Instruction

As these educational institutions were managed and organized by Brahmans and all the books written in Sanskrit, therefore the medium of instruction was Sanskrit.

14. Self-control & Self-Discipline

It was considered to be the best discipline. However Corporal punishment was not altogether ruled out.

15. Wide spread education of women

In the earlier Vedic, and Upanishad times, girls were free to go through the "Upanayana" ceremony, live a life of celibacy, studied Vedas, vedangas and other subjects along with their brother pupils.

16. Duration of Education

In the house of the teacher, the student was required to obtain education up to the age of 24, after which he was expected to enter domestic life students were divided into three categories:

- a) These obtaining education up to the age of 24 – Vasu
- b) These obtaining education up to the age of 36 – Rudra
- c) These obtaining education up to the age of 48.- Auditya.

17. Ultimate aim of education-self-Realization

The ultimate aim of education in ancient India was not knowledge as preparation of life in this world or for life beyond but for complete realization of self-for liberation of the soul from fetters of life, both present and future. That knowledge was real, which led to

emancipation-led from unreality to reality, from darkness to light, from death to immortality.

- **Teachers as Spiritual as well as Intellectual Guide**

Teacher occupied a pivotal position in the Vedic System of education. The teacher was a parent surrogate (Parent Substitute), a facilitator of learning, exemplar and inspirer, confident, detector friend and philosopher moral educator, reformer, evaluator, character and personality builder, importer of knowledge & wisdom and above all a guru, religious & spiritual guide. The relationship between the teachers and pupil was regarded as filial in character. Teacher was the spiritual father of his pupils. In addition to imparting intellectual knowledge to them, he was also morally responsible. He was always to keep a guard over the conduct of his pupils. He must let them know what to cultivate and what to avoid. He must instruct them as how to sleep and as to what food they may take and what they may reject. He should advise them as to the people whose company they should keep and as to which of the villages and localities they should frequent. During the Vedic period learning was transmitted orally from one generation to another. Great importance was attached to the proper accent and pronunciation in the Vedic recitation & these could be correctly learnt only from the lips of a properly qualified teacher. The spiritual solution depended almost entirely upon the proper guidance of a competent teacher.

- **Process of Instruction**

There were three steps in instruction:

1. **Sravana** (listening to words texts as they uttered by the teacher)

2. **Manana** (the process of deliberation or reflection of the topic taught)
3. **Nididhyasana** (represents the highest stage)

- **Methods of Teaching:**

Two methods of teaching were being practiced during the Vedic period. The first method was Muakhik (Oral) and the second was based on Chintan (Thinking or reflection). In the oral method the students were to memories the Mantras (Vedic hymns) and Richayas (Verses of Rig-Veda) in order that they might not be changed wrongly and they might not be changed wrongly and they might remain preserved in their original forms.

Beautiful natural surroundings sitting at the feet of the preceptor the pupils were trying to comprehend the various problems of life through listening, intellection, reflection and meditation. As written language was not developed, the teacher made his pupils learn the text by rote. Every pupil acquired knowledge according to his individual capacity. The basis of the method of teaching was psychological. The students were classified into very intelligent normally and sub normally intelligent, respectively. This classification naturally points to the different in the mental powers of various students.

Every day before the birds announce the day break the students used to recite the Vedic hymns. At the time of recitation careful attention was paid to the correct pronunciation of words. By listening to the Gurus attentively the pupils were trying to commit into their memory the Vedic hymns along with the prescribed pronunciation. Thus, the teaching, in a way was oral. But unintelligent memorization of the Vedic hymns was regarded as utterly futile. It was considered that he who studied Vedas without understanding the proper meaning could be compared to

an ass carrying the load of sandal wood, feels only its weight, without being benefitted by its perfume.

Seminars and symposia were also held from time to time and students were getting the opportunity to show their worth through reasoning and argumentation. In the teaching learning process individual was treated as the teaching unit and individual attention was paid. Students were encouraged to ask questions to the teachers for removing their doubts and difficulties. Through different subjects, teachers were not only trying to stimulate the intellectual curiosity of the students but also transferring something and that something was the high character and.

▪ **Admission and Evaluation System**

There seems to be no direct reference available to spell out the methodology followed by the Acharya to judge the adequacy of knowledge of his pupils. Yaskas and Sayana, famous commentators on the Vedas, have inferred from the Rig Veda hymn that the students were given three grades as under:

1. Maha Prazanan grade:- Students of very high ability.
2. Madhyama Prazanan grade:- Students of high ability.
3. Alpa Prazanan grade:- Students of low ability.

▪ **Education of Women**

The Vedas give a very honourable & respectable status to women. They were eligible for higher education for the study of the Vedas and the performance of administrative and other important jobs mostly performed by men even today. Boys should go to the schools meant for boys and girls should go to the schools where there are women teachers. The women should have opportunity to attain knowledge of the Vedas from all the four concerns.

- **Role of Mother in Education**

A mother should impart education to her children so as to broaden their horizon. At this stage good manners are to be taught so that the children behave properly with the elders and in assemblies.

- **Autonomy of Educational Institutions**

Teachers in the Vedic period were autonomous in their work and they followed various methods of admission and assessment. A teacher was the sole pedagogic authority to decide whether the student was fit for admission & also to decide whether he had completed his studies.

- **Studentship**

There is a long hymn in the 'Atharva Veda' describing the ceremony pertaining to studentship. The initiation ceremony was called Upanayana which lasted three days. It laid down the foundation of a planned life. The pupil owed his first birth-physical to his parents & the second birth spiritual to his teacher. The rite of Upanayana was meant to purify body and mind and to make one fit for receiving education.

After 'Upanayana' the pupil entered into a state of 'Brahmacharya' indicating that it was a mode of life, and a system of education. The 'Brahmachari' as the aspirant for education was now called lived according to prescribed regulations, i.e., physical discipline as well as spiritual discipline.

- **Curriculum**

The beginning of education was marked by the 'Upanayana' a ceremony which was generally performed at a prescribed age level. The age limit was varying from caste to caste. It was eight year, eleventh year and twelfth year, respectively for Brahmins,

Kshatriyas and Vaishyas. The studentship lasted usually for twelve years.

In Vedic period education was not merely theoretical. It was related to the realities of life. Various branches of learning were incorporated in the curriculum. The subjects of teachings were Philosophy, Grammar, Astrology and Logic. In the teaching of languages, emphasis was laid on proper pronunciation and grammar. Along with theoretical aspect of the curriculum, the practical aspects of education was given due importance.

According to recent researches, following disciplines were included in the curriculum in the graded forms in accordance with the stages of education.

- 1) Anthropology
- 2) Astronomy
- 3) Economics
- 4) Epistemology
- 5) Eschatology
- 6) Ethnology
- 7) Geology
- 8) Human eugenics
- 9) Mathematics
- 10) Military Science

▪ **FORMS OF EDUCATIONAL INSTITUTIONS IN VEDIC PERIOD**

1. Gurukulas

Gurukulas were the dwelling houses of gurus situated in natural surroundings away from noise and bustle of cities. Parents sent their wards at the age of five years to nine years according to their castes after celebrating their Upanayan Sanskar. Pupils lived under the roof of their guru called 'antevasin' under the direct supervision of their Guru.

Gurukula as the name indicates was the family of the teacher and his residence where the students used to stay during the period of study. Gradually, the Gurukula were extended to include a number of buildings. However the institution was built up around the family of teacher. The primary duty of the student was to serve the teacher and his family. The students were like sons of the teacher and the whole institution lived like family.

2. Parishads

Parishads were bigger educational institutions where several teachers used to teach different subjects. This may be compared to a college parishad in Upanishads, has been used for a conference of learned men, assembled for deliberations upon philosophical problems. Later on the 'Parishads' were set up at the places where learned men lived in good number and gradually these institutions became permanent centres of imparting knowledge.

3. Sammelan

Sammelan literally means getting together for a particular purpose. In this type of educational institutions scholars gathered at one place for learned discussions and competitions generally on the invitation of the king. Scholars were appropriately rewarded.

2. Teacher Education in Buddhist Period

The monasteries were the centres of education during the Buddhist period. Besides monasteries, there was no other organization for imparting education. Only the Buddhist could receive religious and other types of education. Other persons were deprived of this facility. There was no place for Yajna in the Buddhist system. Buddhist period in Indian education roughly starts from 600 B.C and last for about 1200 years till 600 A.D. during Vedic period education was mostly individualistic effort whereas during Buddhist

period institutional organization is one of the chief characteristics of education.

Buddhist education was based on the teaching of Gautam Buddha. These teachings were so important that they remained a source of inspiration for individual as well as social development in India. The influence of Buddhist teachings cannot be undermined even during later period.

▪ **Aims of education in Buddhist Period**

The chief aims of Buddhist education had been the following

1) Development of education

The chief aim of Buddhist education was all round development of child's personality. This included his physical, mental, moral and intellectual development.

2) Formation of character

During this period, in the organization of education, special emphasis was laid on the formation of character of the students. Student life was hard and rigorous. They observed celibacy.

3) Religious education

In the Buddhist era, religion was given top priority and education was imparted through it. The chief aim of education was propagation of religion and inculcation of religious feelings and education served as a mean to achieve salvation or nirvana.

4) Preparation for life

In this system of education, there was a provision for imparting worldly and practical knowledge along with religious education so that when the students entered normal life they may be able to earn their livelihood.

Four noble truths of Buddhist period

Buddha was primarily an ethical teacher and reformer, not a metaphysician. The message of his enlightenment points to man the way of life that leads beyond suffering. The four noble truths are:-

- I. There is suffering.
- II. There is cause of suffering (Dukhasamaudaya).
- III. There is cessation of suffering (Dukhanirodha).
- IV. There is a way leading to the cessation of suffering (Dukhanirodh- marg).

▪ **Pabbaja ceremony**

Pabbaja was an accepted ceremony of the Buddhist monasteries. Pabbaja means going out. According to this ceremony the students after being admitted to a monastery had to renounce all his worldly and family relationship. An individual belonging to any caste could be admitted to a monastery and after being admitted he did not belong to any caste. For pabbaja ceremony the individual had to get his head fully shaved and put on yellow clothes. In this shape he was presented before the presiding Bhikshu. On presentation this individual would pray for admission to the monastery. On his prayer the head Bikshu would administer three basic advices:

- I. I take refuge with Budha.
- II. I take refuge with religion.
- III. I take refuge with the order.

The aspirant for admission used to pronounce these advices very distinctly. Then his admission was permitted. On being admitted the individual was called a Sharman.

▪ **Upasampada ceremony**

After pabbaja the Buddhist monk had to undergo the Upasampada ceremony. This ceremony was different from pabbaja ceremony. It was after receiving education for twelve years, that it is at the age of twenty years, Upasampada ceremony was performed. The Sharman has to present himself in

front before all other monks of the monastery. One could be admitted for this ceremony only when the majority of the monks voted in favour of the same. After this ceremony the Sharman was regarded as full- fledge member of the monastery. On this occasion all his worldly and family relationships ended.

- **Responsibility of teacher**

Both the teacher and the student were responsible to the monastery or the Buddhist order. But regarding education, clothes, food and residence of the student monk, the teacher was wholly responsible. The teacher was also responsible for any treatment of the student whenever he fell ill. The teacher used to bestow all the affection to his student and used to educate his through lecture and question answer method.

- **Daily routine of students (Diuchariya)**

The student was expected to serve his teacher with all devotion. On rising in the morning the student will arrange everything for the daily routine of the teacher. He will cook his food and clean his clothes and utensils. Whatever he acquired through begging alms, he would place before teacher. The student had to prepare himself to receive education at any time whenever the teacher required him.

- **Curriculum**

The curriculum was chiefly spiritual in nature. It was because the chief aim of education was to attain salvation. So the study of the religious books was most important. This type of curriculum was meant only for the monks. Besides these spinning, weaving, printing of the clothes, tailoring, sketching, accountancy, medicines, surgery and coinage were the other subjects of Buddhist education.

- **Expulsion of pupils**

The teachers of a Buddhist monastery were empowered to expel any student on charge of misconduct or any type of serious disobedience. However, the student was expelled only when it was definitely ascertained that he lacked faith and respect for the teacher and the other things related to the sanctity of the monastery. After the death of the teacher or when the teacher changed his religion or left the monastery for elsewhere, the students also deserted the monastery. The education of the concerned students ended then and there.

- **Method of teaching**

Buddhist education aimed at purity of character. Like Vedic education it was training for moral character rather than psychological development of the students. One has to attain the stage of Bodhisattva. Mental and moral development was emphasized. Following were the methods:-

- 1. Verbal education**

Through the art of writing had been well developed up to Buddhist period yet, due to shortage and no availability of writing materials, verbal education was prevalent as it was in Vedic age. The teacher used to give lessons to the novices who learnt them by heart. The teacher used to put questions on the learning the lesson by heart.

- 2. Discussion**

In order to win discussion or Shastrartha and impress the general public, it was necessary to improve the power of discussion. This was also needed to satisfy the critics and opposing groups and establish one's own cult. Thus, rules were framed for discussion.

- 3. Prominence of logic**

The importance of discussion encouraged the logic in the Buddhist period. The controversial matters could not be

decided without logical argument. Logic was also useful in the development of the mental power and knowledge.

4. Tours

The main of the Buddhist monks was to propagate Buddhism .Hence some Acharyas like Sariputta, Mahayaggalva, Aniruddha, Rahula, etc gave the importance to tours for educating people.

5. Conference

Conferences were arranged on every full moon and 1st day of month in the Buddhist sanghs. The monks of different sanghs assembled and put forward their doubts freely. The attendance of every monk was compulsory in such conference.

6. Meditation in solitude

Some Buddhist monks were more interested in isolated spiritual meditation in lonely forests and caves. Only those monks were considered fit for lonely meditation that had fully renounced the worldly attraction and had spent enough time in the sanghs and had gained the efficiency for solitary medications.

▪ Assembly of learned people

On the beginning and close of every month learned people used to assemble together. This type of assembly together was a very important part of Buddhist education. The purpose of this assembly was to maintain the moral standards of all the monks, because the total education was based on morality. It was compulsory for all the monks to be present in this assemble so much so that even ill monks used to try to attend it anyhow. If due to illness it was not possible for monk to come, then assembly was held near his residence. This assembly was quite democratic and it has immense moral impact on all concerned.

- **The nature of mass education**

The monasteries or Buddha Vihars were the chief centres of learning and only the Buddhist monks could be admitted to them for education. Thus there was no planned arrangement for mass education as such during the period. It form this position it would be wrong to construe that the Buddhist monks were unkindful of the education of the people in general. So at the time of begging alms the monks used to remove the religious doubts of the people through their interesting conversation or short and alp lectures. Thus the people in general received moral and religious education from the monks.

- **Women education**

Women education during the Buddhist period was at its lowest ebb, as the women folk were despised in the sense that Lord Buddha had regarded them as the source of all evils. So he had advised during his regarded them as the source of all evils. So he had advised during his life time not to admit women in monasteries. But after some time due to the insistence of his dear pupil Anand, Buddha had permitted about 500 women along with his stepmother for admission in vihars with many restriction and reservation.

- **Vocation Education**

Vocation education was not ignored during the Buddhist system of education. The monks of Vihar were taught spinning, weaving and sewing in order that they meet their clothing requirement. They were taught architecture as well. Education in architecture enabled them to build up new Vihars or repair the old ones. Similarly the householders following Buddhism but living outside Vihar were given training in different type of and also earn their livelihood.

- **Role of Teacher in Buddhist Education system**

Buddhist philosophy admits the possibility of attaining peace here and now, though, it starts with a pessimistic note. Teacher, therefore, need not have any cry of despair. Bhikshus were the teachers. Buddhist viharas or monasteries have their methods of imitation and training for the apprentices. The preceptor must give his disciple, all possible intellectual and spiritual help and guidance. There was mutual esteem between the teacher and the pupil. Their relations were like father and son. The teacher was regarded as spiritual father or intellectual father of the student. During the Buddhist period the place of teacher in the scheme of education was very important. There were two categories of teachers – Acharyas and Upadhayas. According to Sutra Literature Acharya may admit, according to his unfettered discretion, a number of pupils, who would have to live with him at his house, for a minimum period of twelve years. He would not accept any fees from the pupils under this instruction. The progress shown by pupil was the only factor that determined the continuance of his apprenticeship.

- **Student in Buddhist system of education**

The Buddhist system like the Brahmanical, enjoins upon the pupil the duty of serving this preceptor as a part of education. The pupil is to rise early in morning from the bed and give his teacher teeth-cleanser and water to rinse his mouth with; then, preparing a seat for him, serve him rice-milk to rinse his mouth with; then, preparing a seat for him, serve him rice-milk in a rinsed jug, and after his drinking it, wash the vessel and sweep the place. Afterwards he is to equip him for his begging round by giving him fresh undergarments, girdle, his two upper garments, and his alms-bowl rinsed and filled with water and then is to dress and equip himself similarly if he wants to accompany his teacher but must not walk too far from or near wants to

accompany his teacher but must not walk too far from or near wants to accompany his teacher but must not walk too far from or near him. He is not to interrupt his teacher in speaking, even if he makes a mistake. There were also rules for the expulsion of a pupil by his teacher. In five cases a Saddhiviharika ought to be turned away; when he does not feel great affection for his Upajjhaya, nor great inclination towards him, nor much shame, nor great reverence, nor great devotion.

3. Teacher Education in Medieval Period

The period under review covers the system of education in India from about the 10th century A.D. to the middle of the 18th century, i.e. before the British rule.

- **Muslim education during Medieval Period**

- **Aims and objectives of education:**

- a) Developing love for Muslim culture and religion.
- b) Enabling the individual for Islamic life.
- c) Preparing the students for the next world.
- d) Equipping the students for a vocation.
- e) Preparing individuals for running administration.

- 1. Patronage of the rulers**

The rulers helped in the spread of education. They built educational institutions and universities. They endowed them with the funds. Big landlord also provided financial help for the spread of education. The rulers patronized the men of learning.

- 2. No state control**

The rules neither claim any authority over the educational institutions nor interfered with their management.

- 3. Religion dominated education**

In the words of S.N. MUKERJI, "The whole educational system has been saturated with the religious ideals which influenced the

aim, the contents of study, and even the daily life of the pupils.”

The pupils acquired knowledge as a religious obligation.

4. Countryside as the centre of education

By and large, educational institutions flourished in the countryside.

5. Provision of various discipline

Through education was primarily religion- oriented, it included the study of many intellectual activities like mathematics, astronomy, grammar, polity and politics. Art and literature were also encouraged.

6. Norms of conduct

Adequate stress was laid on well- defined norms of behaviour, pattern of thought, building up personality and character of the pupils.

7. Teacher-pupil relationship

In the Muslim period also the teachers were respected as during the Brahmanic or Budhist period. There was intimate relationship between the teacher and the pupil, although the practice of living with the teacher was not as common with the Muslim as it was in the case of Brahmanic and Budhist period.

8. Learned teachers

Teachers took to teaching for love of learning. They were held in high esteem. Prof. S.N. Mukerji has observed, “Learning was prized for its own sake and as a mark of the highest human development and teaching was never handicapped by examination requirements

9. Individualized instructions

Since the number of students with the teacher was limited, he paid individual attention to each student.

10. Monitorial system

Although a teacher did not have many pupils to teach yet, still the teacher would take the help of senior and advanced students to teach the younger or the junior.

11. Discipline

Punishments were quit severe. Truants and delinquents were caned on their palms and slapped on their faces. A strange mode of punishment was to make the children hold their ears by taking their hands from under their thighs while sitting on their tiptoes.

12. Types of institutions

Primary education was imparted in 'Maktabs' and secondary and high education in 'Madrasahs'.

13. Vocational education

Provision was also made for vocational, technical and professional education. Emperor Akbar took considerable interest in education as is evident from the passage of from the 'Ain-in-Akbar'. The passage makes interesting reading and provides valuable information on the system of instruction, i.e., curriculum, methods of teaching etc.

▪ Chief features of Primary and Elementary Muslim Education

1) Institution of primary education

Primary education was imparted through the 'Maktab' which were attached with mosque or were independent of the mosque 'Khanquahs' of the saints also at some places served as centres of education. Several learned men also taught students at their residences.

2) Financing of the Maktab

Most of the Maktab were either patronized by rulers or had been endowment. They were dependent on the charity of the philanthropists.

3) Management of the 'Maktab'

The 'Maktab' were run under the guidance of the learned 'Maulavis'. They were supposed to be very pious.

4) Curriculum

Curriculum varied from place to place but the teaching of Alphabets and the recitation of Quran was almost compulsory. The students learnt some portions of Quran by heart as this was considered essential to perform religious functions.

5) Language

Arabic and Persian languages were mostly compulsory. For getting high government posts, one had to learn these languages.

6) Fees

There were several village schools where the students were required to pay their instructions, not in cash but in kind.

7) Orphanages

The state set up some Orphanages where the children received education free of charge. Vast endowments were made for these orphanages.

8) Age of admission

At the age of four years, four months and four days, 'Maktab' ceremony or 'Bismillah' was performed to indicate the beginning of the child. This was considered as an auspicious moment for initiation or starting education. Good wishes were offered to the child. 'Surah-i-Iqra' a chapter from the holy Quran was recited on this occasion.

9) Education of sons of Nobles and Rulers

The Muslims nobles as well as rulers engaged tutors to teach their children at home.

10) 'Wide- spread Maktab'

Almost every village had at least, one 'Maktab'. There were several 'Maktab' in town and cities.

11) Curriculum and Mode of Instruction

- a. During those days there were no printed books for the beginners. Wooden books (taktis) were used.
- b. The Quran: After alphabets, words were taught to students.
- c. Stress on Calligraphy: beautiful and fine handwriting was an important element of instruction.
- d. Teaching of Grammar: Grammar was taught as it was considered very valuable in teaching the languages.
- e. Religious Instruction: Instruction imparted in the 'Maktab' was religious through and through.
- f. Books other than Quran: After the Quran, the 'Gulistan' and the 'Bostan' poems of poet Firdausi were taken up.
- g. 'Paharas': Students also learned 'Pahars' (multiple of numbers). Students memorized these while uttering collective in a loud voice.

12) Buildings

In general, the students sat on the ground in the rows under the shade of a tree and the teacher used mat or deer-skin to sit at. He also attended to the students while standing.

▪ The Madrasahs or Madrasas

The 'Madrasahs' imparted secondary and higher education. Often these Madrasahs were attached to mosques. The term 'Madrasahs' is derived from Arabic word 'dars' (a lecture) and means a place where lecture is given. There was difference in principles between the Madrasa and other mosques. When a particular room was set

apart in a mosque for the teaching purposes it was called a Madrasah. Sometimes it was quite close to a large mosque. It functioned as college of higher education where eminent scholars taught different subjects by using the lecture method supplemented by discussions. Management was usually private supported by state grants and endowments. The content of the curriculum was both religious and secular and covered a period from 10 to 12 years. Religious education comprised deep study of the Quran, Islamic law and Sufism. Literature, logic, history, geography, astronomy, astrology, arithmetic, agriculture and medicine were the secular subjects taught in madrasa. Some madrasa had hostels attached to them which provided free boarding and lodging.

Hindu System of Education during the Medieval Period

- **Chief features of Hindu system of Education in India during the medieval period**

1) Lack of state support

With the advent of the Muslim rule, the state support for the Hindu system of education almost ended. Now it depended upon the rich people, scholars and village communities. Of course where there were no Muslim rulers, it received state support. Gradually there remained a few such areas.

2) Religion Oriented Education

The system of education, by and large was dominated by religion.

3) The 'Pathshalas'

Elementary education was imparted in 'pathshalas' which existed both in villages and towns.

4) Building of pathshalas

Usually pathshalas were held in the verandah of some house or under trees. There were also separate houses for pathshalas.

Specific type of buildings for them did not exist. Premises of the temples were also used.

5) Fees

No regular fees were charges from the students. The parents gave presents to the teachers. Students were required to render personal service to the teachers. Sometimes teacher also engaged themselves in part time work to supplement their income.

6) Instructional Methods at the Elementary Stage

There were four stages of Instruction at the elementary stage. In the first stage writing letters of the alphabet on sand was taught to students. In the second stage, the teacher wrote on palm leaves and the students traced over them with red pen and charcoal ink .These cold be rubbed very easily.

In the third stage, the student wrote and pronounced compound components. Excessive practice was given to the students in this regard. Common names of persons were used for this purpose. At this stage also, the student was taught to use the words in the formation of sentences. He was also taught to make a distinction between written and colloquial languages. The students were taught to rules of arithmetic and multiplication tables repeated by the entire class. In the fourth stage, students were taught to use paper for writing.

7) Curriculum at the elementary stage

a) Knowledge of weights and measures was considered essential therefore; arithmetic was a compulsory subject at the elementary stage. According to Dr. Krishnalal Ray, (1989),the elementary schools were mainly for giving instruction to these R's and them practical application (such as composition of letters and business documents.).

- b) Literature was included in the curriculum, real literature taste was not cultivated.
- c) Moral and religious instruction also had a secondary place in these schools.
- d) In some schools, salutation to Goddess Saraswati (the Goddess of learning) was learnt by heart by the students.
- e) Instruction in mythology and sacred love of the Hindus was also given in some schools.

4. Teacher Education in Modern Era

□ Teacher Education in British Period

The expansion of teacher education was observed in terms of quantitative and qualitative aspects. All the described commissions and report emphasis on the quality of teachers in general and teacher educator in specific. It was always a challenging task to make it effective and more practical to achieve perfect quality and relevant in the present context.

□ British Education System before Independent India

First institution for teachers training was started by Danish Missionaries under the inspiring leadership of Ziegenbalg and his colleagues at Tran quebar in (1716). A normal training school generally for the primary or elementary grades was established by William Carey at Serampur (West Bengal) in 1802. In the 1834 Lord Macaulay's came in India as a Law member of the council of government –General on June 13, 1834. In the Minutes of Indian Education his important attention were as, 'Literature' means English literature and not Sanskrit or Arabic or Persian literature, emphasis that medium of instruction should be English and proposed for preparing Code in English his thinking was to change Indian culture. In this to improve Indian educational life conducted a survey to know the real positions of education in

India. This survey was conducted in Madras, Bombay and Bengal only. And the conclusion was that each village had a primary school, corporal punishment was observed, students follow time table, condition of teachers was bad and teachers were ill-educated and ill-paid. Balwaria, Gupta (2014)

Woods Despatch (1854) was the first Milestone of Indian education because it had suggested the various ideas and ways for the development of Indian education. The Wood's Despatch (1854) recommended the establishment of teacher training schools in each of the provinces. Wood's Despatch 1854, on education find out the need for teachers' training, as it desired. There should be training schools for teachers of engineering, medicine and law. The qualified teachers should be given better pay scales. The Despatch further emphasized on the provision of scholarships to the teachers during their training period. These ways ensured a better impetus to the training of the teacher's educators. We have observed that the Despatch includes a number of valuable and fundamental recommendations for future educational development in India. It gave new direction and great dimension to education and laid the foundation of the present Indian educational system.

Indian Education Commission (1882) was considered as second milestone of Indian education. In the field of secondary teachers' training, the first institution was established in 1886 in Madras and was known as Government Normal School, Madras. Indian Education Commission (1882) gave its valuable suggestions in the field of education at various ways. The aim of the Indian University Commission (1892) was to reorganize and strengthen the existing system. Almost all the dimension of education was covered by it. The Commission laid highlight on the establishment of a number of normal schools for secondary

teachers' training throughout the country. It also recommended that an examination in the principle and practice of teaching be instituted and only successful candidates should be employed as teachers in any secondary school. In 1889 Lord Curzon was Appointed Governor General of India. At this time the wave of nationalism was flowing fast. A further step in Teachers' training was taken in 1904 with the passage of Government of India Resolution some social reformers were demanding National Education. They thought that only national Education could safeguard the culture, civilization, literature and language.

The following principles were laid down to improve the teacher training in the country. Balwaria, Gupta (2014)

- 1.** Men of ability and experience should be enlisted to provide adequate staff of welltrained members of the education service.
- 2.** Importance to be given to the equipment of training colleges for secondary teachers.
- 3.** Need was felt of practicing school to the attached to each college to correlate theory with practice of teaching.
- 4.** There should be one-year course leading to a university degree or diploma for graduates. These courses should include both theoretical background along with practical bias. For other, there should be two-year course.
- 5.** Training colleges should be linked with the schools, so that a teacher may not neglect the methods learnt in the college, when he or she accepts teaching as a profession.

Calcutta University Commission (1917) this commission is also known as Sadler Commission. In 1919 the Sadler Commission presented its report and emphasized the role of university in the professional training of secondary school teachers and educational researches. It suggested that the training programmes should not

only make the trainee for educational system but also a good administrator.

Hartog Committee (1929) extended the work initiated by Sadler Commission and gave valuable recommendations and suggested conferences and refresher courses for those teachers who were already in service in order to raise standard of school teachers. As a result, refresher courses for teachers began to be organized, education departments were established in some universities and research degree in Education was started. teachers' training institutions also started equipping and improving their laboratories and libraries. By all these measures teachers' training went on to being benefitted by many improvements. Working on the recommendations of the Sadler Commission it is the example to setup education faculty thirteen universities out of eighteen.

The lady Irwin College was set-up in New Delhi. Andhra University stated a new degree The B.Ed. in 1932. Bombay launched a post Graduate degree in M.Ed. in 1936.

In 1937, **M.K. Gandhi** convened **Wardha Educational Conference** and propounded a new system of education popularly known as 'Basic Education'. Gandhiji felt the need of making teacher-training more practical and functional. He offered craft-centred and productive education for child, correlated with life situations for holistic development. With this, he emphasis in teacher training now shifted to the type of education which was practical and based on the needs of the pupils and the community. This basic Education stated by Mahatma Gandhi leading to the training of teachers for basic schools. In 1938, a Basic Training College was set-up at Allahabad and the Vidyamandir Training school was started at Wardha in 1938.

The Abbott –Wood Report in 1937 came with very valuable suggestions, like “The normal school should concern itself with the social way of education as well as with the technical how to teach.” Also suggested a refresher course for the teacher so that they could get a wider experience.

In 1944 came the Sargentin1906, hardly 29% teachers for High Schools, 37% for Middle Schools and 25% for Primary Schools were trained, in 1947 approximately 61.5% of Secondary and Primary Teachers were trained. This is the effect of the Sargent Report it also emphasis on teacher training programmes the need of refresher course for trained and untrained teachers to be organized at different intervals. It further recommended that the scale of salary of teachers should be increased in order to have able and efficient teachers. In 1937 out of about one lakh secondary men teachers 43,000 were untrained. So, by 1947, teacher training programme was quite comprehensive in India. At the secondary level, out of total 88,000 teachers, hardly 51% were trained. There were about 649 training colleges. Number of secondary level training colleges was 42 only with an intake capacity of 3000 teacher. These figure show that some growth had already taken place till 1947 but over all conditions still needed improvement as the needs of the country were fast expanding.

P.L. Rawat (1970) has rightly remarked that on the whole we can conclude that during this period, the increase in training facilities was not adequate. During the first quarter of the twentieth century an attempt was made to infuse education with a national spirit. Major highlights were, education under Indian control, banishing the feeling of Inferiority, education in Western knowledge and science, English language to be regarded as general subject and meeting inadequacy of vocational education.

□ **Teacher Education in India in Post independent Period**

The post independence period was characterized by major efforts being made to nurture and transform teacher education. The system of teacher preparation has come under considerable pressure as a result of the expansion and growth of school education, through efforts to universalize elementary education. Major efforts have been made to adapt and update the teacher education curriculum to local needs, to make it more context base, responsive and dynamic with regard to best meeting the particular need of India. student teachers should not only be experienced in well structured theory courses but they should be also taught in a way which make them intelligent recipients of knowledge and which help them to develop desired skills, imbibe desired interests and develop desired attitudes.

□ **Recommendations of Different Commissions**

To meet the challenges post independence, role of education was emphasized and at the same time commission was appointed to look the educational problems.

- In 1948 the Government of India appointed the University Education Commission under the chairmanship of **S. Radhakrishnan**. The commission submitted its report in 1949. The commission was mainly concerned with the university education, but it has made recommendations for teachers training also.
 - Teacher training colleges should be remodelled- more time should be given to practice teaching and weightage to practical examination than theory.
 - In the training colleges teachers should be recruited from those who possess sufficient teaching experience.
 - The theory courses should be flexible and adaptable to local need and circumstances.

- In 1952, Government of India appointed the Secondary Education Commission under the chairmanship of **A. A. Mudaliar**. The commission strongly recommended the improvement of working conditions in the training colleges. Valuable suggestions made by the commission were;
 - There should be two years course for non-graduates and one year training course for graduates.
 - The pupil teachers should be trained in one or two extra-curricular activities also.
 - The commission also stressed the importance of refresher courses, short term intensive courses and specialized courses, workshops and conferences for in service teachers.
- Towards implementation of the multipurpose schools need of trained, qualified, competent teachers was felt. There was a need for a planned programme for teacher education. With this aim in view, under the **National Council for Educational Research and Training (NCERT) (1961)** four regional colleges of education, in four regions- Ajmer, Bhopal, Bhubneshwar and Mysore were established in 1963. The characteristics of these teachers education institutions and programme have been ;
 - Design and development of integrated courses of four year duration in a different areas.
 - Establishment of demonstration multi-purpose schools to work in synergy with the Regional Institute of Educations to function as educational laboratories in teachers preparations.
 - A fully professionalized academic schedule involving interaction with community during three summer vacations available in the duration of four years of the teacher education programme to focus on the role of teachers as agent of social change.
- The **Education Commission** under the chairmanship of D.S. Kothari has pointed out clearly the major weaknesses in the

existing system of professional education Visualizing weaknesses in teacher training programme. The commission made many recommendations which may be clarified in to following groups;

- Removing isolation of teacher training from the main academic life.
 - Improving the quality of teachers training programme.
 - Expansion of teacher training facilities.
 - Making adequate provision for continuing professional education of all teachers.
 - Creating appropriate agencies for the maintenance of standards both at the Centre and States.
- **National Policy of Education (1986)** looked at the role of the teacher and the expectation of teacher education in a holistic perspective. It mentioned that the Government and the community should endeavor to create conditions which will help, motivate and inspire teachers on constructive and creative lines. Teachers should have the freedom to innovate, to devise appropriate methods of communication and activities relevant to the needs and capabilities of students and the concerns of the community.
 - In order to bring desirable changes in the field of education **Nation Council for Teacher Education (NCTE)** was set up in 1995. The objective of the council are;
 - To achieve planned and coordinated development of teacher education system throughout the country.
 - To regulate and maintain norms and standards in the teacher education system. The first step for achieving quality standards was the publication in 1998 of the document "Curriculum Framework for Quality Teacher Education" which highlighted the importance of Information and Communication Technology (ICT) and Value Education in teacher education programme.

- **The following points explain the development of education in India after independence:**

1. Expansion of General Education

During the period of planning there has been expansion of general education. In 1951, the percentage of literacy was 19.3. In 2001 the literacy percentage increased to 65.4%. The enrolment ratio of children in the age group of 6-11 was 43% in 1951 and in it became 100% in 2001.

Primary education – been free and compulsory. Midday meal has been started in schools since 1995 to check drop-out rate. The number of primary schools has risen by three times from 2.10 lakh (1950-51) to 6.40 lakhs (2001-02). There were only 27 universities in 1950-51 which increased to 254 in 2000-01.

2. Development of Technical Education

Besides general education, technical education plays important role in human capital formation. The Govt. has established several Industrial Training Institutes, Polytechnics, Engineering colleges and Medical and Dental colleges, Management institutes etc.

These are given below:

(a) Indian Institute of Technology:

For education and research in engineering and technology of international standard, seven institutes have been established at Mumbai, Delhi, Kanpur, Chennai, Khargpur, Roorkee and Gauhati, Technical education is imparted here both for graduation and post-graduation and doctorate level.

(b) National Institute of Technology (NIT):

These institutes impart education in engineering and technology. These were called Regional College of Engineering (REC). These are 17 in number throughout the country. There are other institutes in the country to teach engineering and technical education.

(c) Indian Institute of Management:

These institutes impart education in business management and administration. These institutes are located at Ahmedabad, Bangalore, Kolkata, Lucknow, Indore and Kozhikode.

(d) Medical Education:

There were only 28 medical colleges in the country in 1950-51. There were 165 medical and 40 dental colleges in the country in 1998-99.

(e) Agricultural Education:

Agricultural Universities have been started in almost all States to improve production and productivity of agriculture. These universities impart education and research in agriculture, horticulture, animal husbandry and veterinary sciences etc.

3. Women Education

In India, literacy among women was quite low. It was 52% according to 2001 census. While the literacy among men was 75.8%. Women education was given top priority in National Policy on Education. Many State Governments have exempted the tuition fee of girl's up to university level. Separate schools and colleges have been established to raise level of literacy among women.

4. Vocational Education

National Policy of Education, 1986, aims at vocationalisation of secondary education. Central Govt. has been giving grants to State Governments to implement the programme since 1988. Agriculture, Pisciculture, diary, poultry, typing, electronics, mechanical and carpentry etc. had been included in higher secondary curriculum.

5. Growth of higher education:

In 1951, there were 27 universities. Their number increased to 254 in 2001. In Orissa state, there was only one university in 1951. Now there are 9 universities.

6. Non-formal Education

This scheme was launched on an experimental basis from the Sixth plan and on regular basis from Seventh plan. The aim was to achieve universal elementary education to all children in the age group of 6-14 years. The scheme was meant for those children who cannot attend schools regularly and for full time due to poverty and pre-occupation with other works.

The Central Govt. is providing assistance to State Govt. and voluntary organisation to implement the scheme. Non-formal education centres have been set up in remote rural areas, hilly and tribal areas and in slums. These impart education to children of 6-14 age group.

7. Encouragement to Indian Language and Culture

After the adoption of National Policy of Education 1968, regional language became the medium of instruction in higher education. Syllabus on science and technology, dictionaries,

books, and Question Papers are translated into regional languages. Indian history and culture have been included in school and college curriculum.

8. Adult Education

Simply speaking adult education refers to the education for the illiterate people belonging to the age group of 15-35 years. The National Board of Adult Education was established in the First Five Year Plan. The village level workers were assigned the job of providing adult education. The progress remained not too good.

The National Adult Education Programme was started in 1978. The programme is considered as a part of primary education. National Literacy Mission was also started in 1988 to eradicate adult illiteracy particularly in rural areas.

The Centre gives assistance to states, voluntary organisations and some selected universities to implement this programme. There were 2.7 lakh adult education centres working in the country in 1990-91. This programme helped to raise the literacy rate to 65.38% in 2001.

9. Improvement of Science Education

Central Govt. started a scheme for the improvement of science education in schools in 1988. Financial assistance is given to provide science kits, up gradation of science laboratories, development of teaching material, and training of science and mathematics teachers. A Central Institute of Educational Technology (CIET) was set up in NCERT to purchase equipment for State Institutes of Educational Technology.

10. Education for all

According to 93rd Amendment, education for all has been made compulsory. The elementary education is a fundamental right of all children in the age group of 6-14 years. It is also free. To fulfill this obligation Sarva Shiksha Abhiyan (SSA) has been launched.

The above discussion makes it clear that a lot of development in education has been made in India after Independence. There is wide growth in general education and higher education. Efforts have been made to spread education among all sections and all regions of the country. Still our education system is ridden with problems.

□ Emerging New Concerns

Globalization and technological advancement have unleashed forces that compel us to re-examine our whole system of education. Promotion of national and international understanding, learning centred education, inculcation of values, quality teaching are the major emerging concerns of education. Hence the changing role of teacher and the changing definition of teacher effectiveness have been increasingly felt. The current focus of policy makers with regards to teacher education should be on the development of professional competencies and on the most effective ways of achieving higher level of commitment and motivation for higher level performance on the part of teachers. Today teachers are expected to work as professionals with the increasing professionalism in human services. A true professional teacher can only be able to impart quality teaching. They should have adequate knowledge, skill and attitude for their profession to do their job well. Such knowledge skill and attitude should become the basis of teacher education curriculum. A teacher

invariably is a teacher of same subject or branch of knowledge. It is incumbent on the teacher's part to know enough of the subject as to be able to teach it. Teacher's commitment to knowledge implies several aspects. He/ she must have knowledge about subject matters, pedagogical content knowledge, knowledge of learner, knowledge of educational aims, and knowledge about the national and international concerns.

To have mastery over subject matter is not only sufficient to make the learning effective. Many skills are required to communicate the information effectively, so a teacher education programme should equip the pupil teacher with varied skills so that they can communicate according to the learner's need. A teacher must also have positive attitude towards his job and students. Pupil teacher should be able to capture the attention of the students during lesson, to stimulate them intellectually and more than emotionally to install in them a love for the subject and desired to learn more about it, to motivate them to work on their own, to see them to grow into a self actualized individual. Thus in teacher education programme pleasant experiences should be provided to student-teachers by which they can develop favourable attitude towards themselves, their job and their students.

Learner is the kingpin and educational activities do not achieve success without improvement in him/her. Under the impact of 'learner centred education' or constructivism, it is now widely believed that in order to be meaningful, the education process must be learner centred. It should enable each learner to learn as best as he/she can and help him/her go as far possible. Hence, the role of the teacher shall now be as visualized by Sri Aurobindo as far back as 1910; "The first principle of true teaching is that nothing can be taught. The teacher is not an instructor or task master; he is a helper and a guide. His

business is to suggest and not to impose. He does not actually train the pupil's mind; he only shows him how to perfect his instrument of knowledge and helps and encourages him in the process. He does not impart knowledge to him; he shows him how to acquire knowledge for himself. He does not call for the knowledge that is within; he only shows him where it lies and how it lies and how it can be habituated to rise to the surface "

It expects teachers to teach each learner according to one's interest, abilities and profound learning style. Learner centred education becomes all the important in the context of Howard Gardener's theory of multiple intelligence.

But, in India the diversity of the culture and heterogeneity, such as, rural-urban, tribal, socially disadvantaged and groups with special needs make the issue learner centred education more complex.

For learner centred education, it is necessary to select and use appropriate teaching strategies and innovations because they play significant role in increasing the effectiveness and quality of teaching learning process. At the time of teacher education programme pupil teachers should be equipped with the knowledge of different skills, strategies and techniques to handle the subject matter according to the psychology of the student. Development in information and communication technology has offered possibilities for raising the quality of teaching learning process. By using new instructional technology, which will use multimedia, we can make learner centred pedagogy. Teacher education programme should make the teachers able to keep balance between different teaching strategies either with ICT or without ICT.

Today, the world obsessed with the worldly success and material prosperity has reduced the very meaning of education to a mere

catering and equipping of mankind for a competition where only the fittest survive. In this, whole orientation of education, the self of an individual and its values has deteriorated to a situation where mankind has become more of a machine. In a system of education, where teaching and instruction are almost identified, there is very little flexibility where example and influence can play their legitimate role. Moreover, our present system is a continuous series of instructions punctuated by homework and tests which accentuate the rigidity of procedure and mechanical adherence to schedule of timetable, syllabi and examinations. In the rigid and mechanical structure, the centre of attention is not the child but the book, the teacher and the syllabus. The methods which are most conducive to the development of personality of the child such as the methods of self learning, exercise of free will, individualized pace of progress, group activities etc. do not have even an elbow room. Indeed, if this is the system of education and if we are to remain content with this system of education, most important element of learning will forever remain outside the system and we cannot confidently recommend any effective system of learning, much less effective programme of value education.

The mother founded the Sri Aurobindo International Centre For Education at Pondicherry said; "To learn for the sake of knowledge, to study in order to know the secrets of nature and life, to educate oneself in order to grow in consciousness, to overcome one's weakness, incapacities and ignorance, who prepare oneself to advance in life towards a goal, that is nobler and wiser, more generous and more true..... They hardly give it a thought and consider it all very utopian. The only thing that matters is to be practical, to prepare them-selves and learn how to earn money".

Therefore, teachers' will have to provide learning experiences for holistic development of mind, body, intellect and emotions. So the challenge of teacher education will be to prepare such teacher who can take care of the holistic education of children. This would require value oriented teacher education.

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Evolving a Taxonomy of Educational Skills

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Ultimate aim of Education any where should be to develop a complete human being. For that skills need to be developed in all the domains to live happy, productive and peaceful life. Hard skills are the core skills which are required for innovation, creation, construction, and production in various disciplines, such as, Physics, Chemistry, Mathematics, Biology, Engineering & Technology, Arts, Commerce. The various phases are sensitivity, germination, incubation, innovation, creation, construction, development and implementation, whether it is designing, production and flying of an aero-plane or sensing, creating, composing and reciting a poem, or formulating, producing, analyzing and injecting a drug, or designing, development, organization and administration of an institution. Soft Skills are needed for everyday transaction. These are required for how people relate to each other: communicating, engaging in dialogue, giving feedback, cooperating as a team member, contributing in meetings and resolving conflicts, setting an example, team-building, facilitating meetings, encouraging innovations, solving problems, making decisions, planning, delegating, observing, instructing, coaching, encouraging and motivating. To be good at hard skills usually takes smarts or IQ (also known as our left brain-the logical center). To be good at soft skills usually takes Emotional Intelligence or EQ (also known as our right brain- the emotional center). Hard skills are skills where the rules stay the same regardless of which company, circumstance or people you work with. In contrast, soft skills are self management skills and people skills where the rules change depending on the company culture and people you work with. For example, programming is a hard skill. The rules for how we can be good at creating the best code to do a function is the same regardless of where we work. Communication skills are a set of soft skills. The rules for how to be effective at communication change and depend on the audience and the content we are communicating. Hard skills can be learned in school. There are usually designated level of competency and a defined path as to how to excel with each hard skill. Most soft skills are not taught well in school and have to be learned on the job by

trial and error. Careers can be classified into three categories, careers that need hard skills and little soft skills, both hard & soft skills, mostly soft skills and little hard skills.

But, Hard Skills & Soft Skills combination is rarely found. There is less research, but, more publication, less creation but more communication, less production, but, more marketing and vice versa. Masses are lost in customary designs. Hard Skills which emerge through sound theoretical base or lead to theory, with practice, patience and perseverance having precision and perfection passionately emerge. Soft skills demand environmental sensitivity & action. Communication, transaction and transmission through the soft skills infuse life into this sphere.

Here, the intent is to arrive at a combination of hard skills & soft skills. Hard and soft skills are often referred to when entering into & living a profession. While hard skills are essential to enter, it is the soft skills that facilitate professional ethics & aesthetics. To be a good personality fit for any profession we need to be quality producers, humanistic communicators, and civilized & scientific consumers.

Some Illustrations on Hard Skills

Our very own inner GPS



The discovery of brain cells — our very own "inner GPS system" that tells us who we are, how we find our way from one place to another and how we store that information to find the way the next time we trace the same path has won the Nobel Prize in Physiology or Medicine 2014.

One British scientist and two Norwegian scientists have shared the prize "for their discoveries of cells that constitute a positioning system in the brain".

The Nobel was divided — one half awarded to John O Keefe, the other half jointly to the husband wife duo Edvard I Moser and May-Britt Moser.

May-Britt Moser is the 11th woman to win the medicine Nobel since the award began in 1901. She got to know the news while working in her lab on Monday. Her husband had just got onto a flight to Munich when the news reached her.

A spokeswoman at the university in Trondheim said May-Britt Moser "needed a minute to cry and speak with her team".

Committee chairman Goran K Hansson said "The discovery of the brain's positioning system has opened new avenues for understanding other cognitive processes, such as memory, thinking and planning".

In patients with Alzheimer's disease, the parts of the brain - hippocampus and Entorhinal cortex, where the discoveries were made, are frequently affected at an early stage and these individuals often lose their way and cannot recognize the environment.

"Knowledge about the brain's positioning system may, therefore, help us understand the mechanism underpinning the devastating spatial memory loss that affects people with this disease. Since the initial description of place and grid cells in rat and mice, these cell types have also been found in other mammals," the Committee said.

Brain disorders are the most common cause of disability and yet there is no effective way to prevent or cure most of these disorders. The episodic memory is affected in several brain disorders, including dementia and Alzheimer's disease.

"A better understanding of neural mechanisms underlying spatial memory is therefore important, and the discoveries of place and grid cells have been a major leap forward to advance this endeavour".

Keefe has showed in a mouse model of Alzheimer's disease that the degradation of place fields correlated with the deterioration of the animals' spatial memory.

In 1971, Keefe who is now the director of the Wellcome Centre in Neural Circuits and Behaviour at University College London discovered the first component of this positioning system. He found that a type of nerve cell in an area of the brain called the hippocampus was always activated when a rat was at a certain place in a room. Other nerve cells were activated when the rat was at other places. O' Keefe concluded that these "place cells" formed a map of the room.

More than three decades later, in 2005, the Mosers discovered another key component of the brain's positioning system. They identified another type of nerve cell, which they called "grid cells" that generate a coordinate system and allow for precise positioning and path finding. Their subsequent research showed how place and grid cells make it possible to determine position and to navigate.

According to the Nobel Committee which kicked off this year's Nobel prizes on Monday with the prize for medicine and physiology, the sense of place and the ability to navigate are some of the most fundamental brain functions.

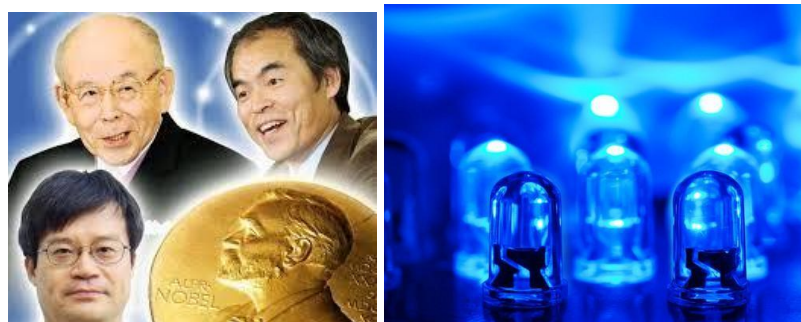
"We depend on these spatial functions for recognizing and remembering the environment to find our way," the committee said.

Questions about these fundamental brain functions have engaged philosophers and scientists for a long time. During the 18th century the German philosopher Immanuel Kant argued that some mental abilities exist independent of experience. He considered perception of place as one of these innate abilities through which the external world had to be organized and perceived.

Keefe was fascinated by the problem of how the brain controls behaviour and decided, in the late 1960s, to attack this question with neurophysiological methods. When recording signals from individual nerve cells in a part of the brain called the hippocampus, in rats moving freely in a room, Keefe discovered that certain nerve cells were activated when the animal assumed a particular place in the environment. He could demonstrate that these "place cells" were not merely registering visual input, but were building up an inner map of the environment. Keefe concluded that the hippocampus generates numerous maps, represented by the collective activity of place cells that are activated in different environments. Therefore, the memory of an environment can be stored as a specific combination of place cell activities in the hippocampus.

May-Britt and Edvard Moser were mapping the connections to the hippocampus in rats moving in a room when they discovered an astonishing pattern of activity in a nearby part of the brain called the entorhinal cortex. Here, certain cells were activated when the rat passed multiple locations arranged in a hexagonal grid. Each of these cells was activated in a unique spatial pattern and collectively these "grid cells" constitute a coordinate system that allows for spatial navigation. Together with other cells of the entorhinal cortex that recognize the direction of the head and the border of the room, they form circuits with the place cells in the hippocampus. This circuitry constitutes a comprehensive positioning system, an inner GPS, in the brain.

New light to illuminate the world



This year's Nobel Laureates are rewarded for having invented a new energy-efficient and environment-friendly light source – the blue light-emitting diode (LED). In the spirit of Alfred Nobel the Prize rewards an invention of greatest benefit to mankind; using blue LEDs, white light can be created in a new way. With the advent of LED lamps we now have more long-lasting and more efficient alternatives to older light sources.

When **Isamu Akasaki, Hiroshi Amano** and **Shuji Nakamura** produced bright blue light beams from their semi-conductors in the early 1990s, they triggered a fundamental transformation of lighting technology. Red and green diodes had been around for a long time but without blue light, white lamps could not be created. Despite considerable efforts, both in the scientific community and in industry, the blue LED had remained a challenge for three decades.

They succeeded where everyone else had failed. Akasaki worked together with Amano at the University of Nagoya, while Nakamura was employed at Nichia Chemicals, a small company in Tokushima. Their inventions were revolutionary. Incandescent light bulbs lit the 20th century; the 21st century will be lit by LED lamps.

White LED lamps emit a bright white light, are long-lasting and energy-efficient. They are constantly improved, getting more efficient with higher luminous flux (measured in lumen) per unit electrical input power (measured in watt). The most recent record is just over 300 lm/W, which can be compared to 16 for regular light bulbs and close to 70 for fluorescent lamps. As about one fourth of world electricity consumption is used for lighting purposes, the LEDs contribute to saving the Earth's resources. Materials consumption is also diminished as LEDs last up to 100,000 hours, compared to 1,000 for incandescent bulbs and 10,000 hours for fluorescent lights.

The LED lamp holds great promise for increasing the quality of life for over 1.5 billion people around the world who lack access to electricity grids: due to low power requirements it can be powered by cheap local solar power.

The invention of the blue LED is just twenty years old, but it has already contributed to create white light in an entirely new manner to the benefit of us all.

The establishment has outgrown in most of the fields in India, such as, Teacher Education, Engineering, Medicine, and even Agriculture. The main cause & effect are the improper planning & unemployable product. The human development should ensure self-employability in respective fields.

Science without experimentation skills, Art without creativity, Commerce without substance, Mathematics without speculation, Logic without reasoning, Schools without life skills, Polity without statesmanship, and nature without beauty are empty. There is a need to realize skills in all the areas. But, the question is have Life Skills, Thinking Skills, Human Development Skills, Management Skills, Emotional Skills, Adaptability and Social Responsibility Skills, Vocational Skills, Professional Skills, and many more skills have achieved the status of Skills?

Dhodi Nayana & Goel Chhaya (2012) have published a book- Enhancing Info-Savvy Skills in Student Teachers: A Research Work. The book reports the Doctoral Study of Ms. Dhodi Nayana under the Guidance of Dr. Chhaya Goel. The volume demonstrates very

well how the info-savvy skills of Asking, Accessing, Analyzing, Applying and Assessing were developed in the Pre-Service Teachers of India through surfing on Cultural Heritage of India, Buddhist Heritage of India and on the domains of their respective discipline methods. It has been a joyful experience to travel through this volume experiencing various surfing skills, viz., skimming, scanning, authenticating, hyperlinking, switching, skipping culminating into Educational Immersion for seeking solutions.

Helaiya Sheetal & Goel D.R. (2011) published a book-Life Skills Programme for Student – Teachers: A Research Work. The book embodies the doctoral work of Ms. Sheetal Helaiya on enhancement of Life Skills through development and implementation of a Life Skills Program for Secondary Student-Teachers. The following Life Skills identified by the WHO were considered for the study:

- Self Awareness Skill
- Empathy Skill
- Interpersonal Relationship Skill
- Effective Communication Skill
- Critical Thinking Skill
- Creative Thinking Skill
- Decision Making Skill
- Problem Solving Skill
- Coping with Emotions Skill
- Coping with Stress Skills

An exhaustive attempt was made to differentiate all these Life Skills into various components. Number of Activities were designed, developed and implemented to enhance the Life Skills. The Life Skills Program was implemented on the Pre-Service Teachers during 2008-2009 at the Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, India. Post-intervention scenario on the Life Skills of the Student-Teachers revealed that there was a remarkable gain in their Self Awareness Skill, Effective Communication Skill, Interpersonal Relationship Skill, Coping with Emotions Skill, Decision Making Skill and Problem Solving Skill. There was moderate gain in their coping with stress skill, Empathy Skill, Critical Thinking Skill and Creative Thinking Skill. The most impeding factor in life is that most of us lack Self Awareness Skill, that is, neither we know our strengths, nor do we know our weaknesses. We do not know our goals. As a result we are poor in many other life skills. If we fail to identify with the self, then we fail to identify with others also, that is, we lack empathy skill. Creative Thinking Skill and Critical Thinking Skill, both in one, is a rare combination. We need to learn how to zoom out and zoom in. The complexities of life are increasing day by day. We need to learn how to cope up with the stress and emotions. We need to learn how to be our own selves and equally how to be one with the others. We need to realize healthy constellation through empathy, interpersonal relations and effective communication. We need to make right decisions, timely. Teachers need to possess healthy life skills for

development of healthy society. So the Life Skills should be integrated in Teacher Education.

Vaidehi P. Gupta (2013) conducted a Study- Role of ICT for Wholistic Development of the Student Teachers. It is evident from the study that ICT does play its role in wholistic development of Student Teachers. We need to extend the role of ICT for development of all the domains wholistically.

The complexity of the prevailing conditions demands skills for healthy, peaceful, harmonious, full & meaningful living under highly complex socio-cultural-political-economic-demographic conditions. So, there is a need to integrate skills in Education. There are innumerable skills which various tasks demand. There is a need to arrive at skill level in all the areas to cope up with the challenges. Education ought to be rational as well as scientific. There is a need to realize Skill inclusive, Skill integrated, and Skill evolving School Education & Teacher Education at all levels, right from pre-primary to tertiary & continued education. The present article attempts to evolve a taxonomy of Educational Skills & explore the status of Education Scholars on 25 Skills.

TAXONOMY OF EDUCATIONAL SKILLS

Taxonomy of Educational Skills has been presented under the following 12 Domains:

1. Self Development Skills
2. Social Skills
Interpersonal & Collaborative Skills, Communication Skill, Resilience Skills, Social Responsibility Skills, Human Relations Skills, Emotional Skills, Adjustment Skills, Human Development Skills, Citizenship Skills, Accountability & Adaptability Skills
3. Life Skills
4. Critical Thinking & Training Thinking Skills
5. Research Skills
6. Constructivist & Connectionist Skills
7. Systems Thinking Skills
8. Information Age Skills
Info-savvy Skills, Techno-pedagogic Skills, Digital Age Skills, Open Education Resourcing Skills
9. Leadership, Administration & Management Skills
Creative Leadership Skills, Administration Skills, Time management Skills, Key Skills for Every Manager
10. Spiritual Development Skills
11. Yoga Skills
12. Wholistic Development Skills

1.SELF DEVELOPMENT SKILLS

Category- I: Self Development Skills

- a. Monitoring one's own learning needs.
- b. Locating appropriate resources.
- c. Transferring learning from one domain to another.

2. SOCIAL SKILLS

Category-II: Interpersonal & Collaborative Skills

- a. Demonstrating Networking & Leadership
- b. Adapting to Varied Roles & Responsibilities
- c. Working Productively with others
- d. Exercising Empathy
- e. Respecting Diverse Perspectives

Category -III: Communication Skill

- a. Who
- b. Says What
- c. To Whom
- d. Through Which Channel
- e. With what effect
(With a variety of contexts & Through a variety of forms)

Category-IV: Resilience Skills

- a. Critically sensing the deviant behaviour(s)
- b. Cause & Effect Analysis
- c. Marginal Analysis
- d. Functional Analysis
- e. Regressing Efficiently

Category-V: Social Responsibility

- a. Acting Responsibly
- b. Demonstrating Ethical Behavior in
 - Personal life
 - Workplace
 - Community

Category- VI: Human Relation Skills

- a. Decency
- b. Decorum
- c. Discipline
- d. Empathy
- e. Sharing
- f. Fellow-Feeling
- g. Politeness
- h. Peace & Harmony
- i. Healthy Competition

Category VII: Emotional Skills

- a. Self Awareness
- b. Self Management
- c. Social Sensitivity
- d. Social Management

Category VIII: Adjustment Skills

- a. Skill of Home Adjustment
- b. Skill of School Adjustment
- c. Skill of Social Adjustment
- d. Skill of Emotional Adjustment
- e. Skill of Health Adjustment
- f. Skill of Symbiosis

Category- IX: Human Development Climate

- a. Trust
- b. Risk Taking
- c. Openness
- d. Reward
- e. Responsibility
- f. Support
- g. Feedback
- h. Team Spirit
- i. Collaboration

Category X: Citizenship Skills

- a. Sovereign
- b. Social Sensitivity
- c. Learning about Community
- d. Secularity
- e. Democratic
- f. Public & Republic
- g. Leadership
- h. Management
- i. Cooperation & Collaboration
- j. Participation Skill

Category- XI: Accountability & Adaptability

- a. Exercising personal responsibility in personal, workplace & community contexts;
- b. Setting & meeting high standards.

3. LIFE SKILLS

Category-XII: Life Skills

- a. Self Awareness
- b. Empathy
- c. Interpersonal Relationship
- d. Effective Communication
- e. Critical Thinking
- f. Creative Thinking
- g. Decision Making
- h. Problem Solving
- i. Coping up with emotions
- j. Coping up with Stress

4. Critical Thinking & Training Thinking

Category- XIII: Critical Thinking Skill

- a. Analyzing
- b. Reflecting
- c. Querying Evidence
- d. Conjecturing Alternatives
- e. Drawing Conclusion
- f. Stating Results
- g. Justifying Procedures
- h. Presenting Arguments
- i. Self Regulation

Category IV: Training Thinking

- a. Depressive to Booming
- b. Non-Pathological to Pathological
- c. Invalid to Valid
- d. Polar to Null
- e. Ego-centric to Socio-centric
- f. Obsessive to Final
- g. Partistic to Wholistic
- h. Non-sensible to Sensible
- i. Traditional to Modern
- j. Pessimistic to Optimistic
- k. Crooked to Straight
- l. Rigid to Flexible
- m. Unsocial to Social
- n. Dependent to Autonomous
- o. Narrow to Broad
- p. Practical and Theoretical
- q. Non-Technical to Technical
- r. Non-Logical to Logical
- s. Non-Imaginative to Imaginative

5. RESEARCH SKILLS

Category-XV: Research Skills

- a. Skill of identifying problem
- b. Skill of formulating Problem
 - Developing Conceptual Framework
 - Skill of Reviewing & implication
 - Skill of Research Questioning
 - Developing Rationale
 - Constructing Statement
 - Enunciating Objectives
 - Formulating Hypotheses
 - Operationlization/Explanation of Terms
 - Deciding Research Type
 - Research Designing
 - Cognizing Population & Sampling Techniques
 - Specifying Delimitation
 - Constructing/Selecting Tools & Techniques
 - Laying down Data Collection Procedure
 - Working out/ Deciding Data Analysis Techniques

- Interpreting Analyzed data
- Formulating Findings
- Discussion Mechanism
- Converging into Theses
- c. Building Theory

6. Constructivist & Connectionist Skills

Category-XVI: Constructivist Skills

- a. Engagement
- b. Germination
- c. Incubation
- d. Innovation
- e. Creation

Category-XVII: Connectionist Skills

- a. Interpretation of units
- b. Activation of the network of units
- c. Learning Algorithm
- d. Recurrent Neural Networking
- e. Evolving continuous, dynamic systems approaches

7. Systems Thinking

Category-XVIII: Systems Thinking

- a. Cognizing all the parameters
- b. Establishing interrelation & interdependence
- c. Realizing Integrated Whole
- d. Ensuring Efficiency
- e. Ensuring Cost Effectiveness

8. Information Age Skills

Category-XIX: Info-Savvy Skills

- Asking
- Accessing
- Analyzing
- Applying
- Assessing

Category-XX: Techno-Pedagogic Skills:

- Media-Message Compatibility
- Media Designing

- Integration of message, media and modes
- Proximity of Message Forms
- Media Language Proficiency
- Media Choice
- Media Credibility & Message Authenticity

Category-XXI: Digital Skills

- Functional Literacy skills: Use of images, graphics, videos, charts and visual literacy.
- Scientific Literacy skills: Understanding of both theoretical and applied aspects of science and mathematics.
- Technological Literacy skills: Competence in the use of information and communication technologies.
- Information Literacy skills: Ability to find, evaluate and make appropriate use of information, including via the use of ICTs.
- Cultural Literacy skills : Appreciation of diversity of cultures.
- Global Awareness skills : Understanding of how nations, corporations and communities all over the world are interrelated.

Category –XXII : Open Education Resourcing

- Open Education Resources for Learners
 - I. Learning- Content (geogebra, google earth)
 - II. Creativity (hot potato, C map)
 - III. Evaluation (R-campus & Mahara)
- Open Education Resources for Teachers, Teacher Educators & Facilitating Learning
 - I. Learning Management System (Moodle & Wiki spaces)
 - II. Teacher Managed Communication Platforms (Classroom 2.0 & Web Quest)
 - III. Statistical Tools for data processing
 - IV. e-Journals
 - V. e-books
 - VI. e-News Letters
 - VII. Webinars & Web Conferencing
 - VIII. WBI

9. Leadership, Administration & Management Skills

Category XXIII: Creative Leadership Skills

- a. Socio-centric rather than ego driven
- b. Empowers the people to make decisions rather than take decisions
- c. Listen oriented than tell oriented
- d. Pulls the organization towards a vision
- e. Listens to intuition

- f. Generates lasting commitment
- g. Open minded than opinionated
- h. Teaches importance of self responsibility rather than teaches subordinates to take directions
- i. Models self responsibility rather than in a self protect mode
- j. Knows, relaxing control yields results rather than is afraid of losing control
- k. Focuses on building on strengths rather than finding & fixing problems.
- l. Teaches how to learn from mistakes rather than quick to fire those that fail

Category: XXIV: Administration Skills

- a. Planning
- b. Organizing
- c. Staffing
- d. Coordinating
- e. Budgeting

Category XXV: Time Management

- a. The ability to Say “ No” ,Learning to Say “No”, How to Say “No”
- b. Spacing Things Out; Do not procrastinate
- c. Using Social Time Wisely
- d. Prioritizing and Reprioritizing constantly
- e. Keeping your health/sleep/exercise in check

Category- XXVI: Key Skills for Every Manager

- a. Leadership and People Management
Attract, retain, motivate, coach and develop team members for high performance.
- b. Communication Skills
Communicate, present, assert, speak senior management language
- c. Collaboration Skills
Influence, build relationships, manage conflicts
- d. Business Management Skills
Understand strategy, business functions, decision-making and workflow
- e. Finance Skills
Budget, forecast, manage cash flow, understand financial statements, manage business metrics
- g. Project Management Skills
Plan and manage successful projects, manage risks, costs, time and project teams

10. Spiritual Development Skills

Category XXVII: Spiritual Development

- a. Religiosity
- b. Knowledge of Soul
- c. Quest for life values
- d. Conviction, Commitment & Character
- e. Happiness & Distress
- f. Brotherhood
- g. Equality
- h. Acceptance & Empathy
- i. Love & Compassion
- j. Flexibility
- k. Leadership in Educational Change

11. YOGA Skills

Category XXVIII: Yoga Skills

- a. Yama or Eternal Vows: Ahimsa, Satya, Asteya, Aprigraha & Brahmacharya
- b. Niyama or Observances: Saucha, Santosha, Tapas, Savdhyaya, Ishvarapranidhana
- c. Asana: Firm, Comfortable Meditative Posture
- d. Pranayama: Regulation of the Vital Force
- e. Pratyahara
- f. Dharna
- g. Dhyana
- h. Samadhi

12. Wholistic Development Skills

Category XXIX: Wholistic Education Skills

- a. Subject Knowledge
- b. Inter-disciplinary
- c. Environmental Attitude
- d. Health Development
- e. Emotional Development
- f. Spiritual Development
- g. Integrated Development

Category XXX: Universal Becoming Skills

- a. Relating Self with all the entities
- b. Treating Nature as a Source
- c. Realizing Resonance amongst all Entities
- d. Realizing Universal Development Index (UDI)

STATUS OF EDUCATION SCHOLARS ON 25 SKILLS

1. Info-Savvy Skills

In this digital age of ICT everyone should be info-savvy, that is, in a position to skillfully do Asking, Accessing, Analyzing, Applying and Assessing. But, a large majority of us are not info-savvy. There is a need of integrating info-savvy skills in Education.

2. Techno-Pedagogic Skills

Most of the Teachers and Teacher Educators, even in this age of ICT are Pedagogues, but not Techno-Pedagogues. There is a need to develop Techno-Pedagogic skills, such as, Media-Message compatibility, Temporal and Spatial Proximity of Message Forms, Media Language Proficiency, Message, Media and Mode integration, Realizing Media Credibility & Message Authenticity, Media Search & Choice.

3. Vocational & Occupational Skills

We need to identify, nurture and develop vocational and occupational skills in various areas, such as, agriculture, horticulture, sericulture, electricity, electronics, sewing, plumbing, nursing, so that, the young ones become productive and self-supportive.

4. Research & Construct Skills

There are various research skills, such as, imagination & creativity, logic & reasoning, conceptual & theoretical thinking, reflection & feedback, data collection, experimentation, analysis and dissemination. These days there is added focus on Constructivist Approach. The constructivist approach demands various skills, such as, Engaging, Exploring, Explaining, Elaborating and Evaluating. All these skills need to be comprehensively identified and practiced.

5. Management Skills

There should be Education for critical & creative managers along with the abilities of planning, organizing and controlling. Creative and critical management demands various skills, such as, Instantaneously zooming out and zooming in, More Eco-driven than Ego-driven, Sometime over & above the systems but never against the system, Always deals in public agenda, never in personal agenda, Is open minded rather than closed opinionated, Sets the organization towards vision rather than lost in routines, Delegates to the level of irreversibility, Believes in building on strengths, Generates lasting commitment, Brings the processes to logical end, Believes in Total Quality Management, Deals in reality with intelligence, wit and humour. There is a need to integrate Management Skills in Education.

6. Life Skills

Various Life Skills, such as, Self-Awareness, Empathy, Inter-Personal Communication, Coping-up with Stress, Coping-up with Emotions, Creative Thinking, Critical Thinking, Decision Making and Problem Solving have been introduced in the School Curricula in India under Co-Scholastic

Areas, but the Teacher Education institutions have largely not integrated these skills. There is a need to bridge the gaps between requirements of School Education and Teacher Education.

7. Adjustment Skills

Life is Adjustment. There should be adjustment in all spheres of life, such as, Home, Health, Society, Emotions and Education. How to adjust in all the areas? All of us need to learn to live together. Adjustment simultaneously in all the areas is rarely found these days. There is a need to realize comprehensive adjustment. There is a dire need to realize symbiosis.

8. Special Education Skills

Learners with Special needs require specially skilled teachers. Also, the scope of Technology Integrated Special Education needs to be explored. Even the Software packages like JAWS are not easily accessible.

9. Human Development Skills

Education should be man making. There is a need to integrate emotional development skills, spiritual development skills, and above all human development skills. Wholistic Education & Evaluation demand conceptualization, acculturation, classification and integration of various skills. Some appreciable attempts have been made and are being made, both, at the School Education and Teacher Education levels.

10. Accountability & Adaptability

There is a need to exercise responsibility in personal, workplace and community contexts, so as to set and meet high standards. We owe an explanation to the self, as well as, others for each and every act of ours. We need to moderate our temperament many a times with others. Before we attempt to supersede others we need to learn to transcend our own selves.

11. Communication Skills

There is a need to establish effective communication in a variety of contexts through a variety of forms, both, intra-personal & interpersonal, intra-faculty & interfaculty, intra-nation & inter-nation. We need to be fully sensitive to the effects of who, says what, to whom, & through which channel, be it Grampanchayat, University Board of Studies, Syndicate, Senate, Central Advisory Board of Education, Legislative, Judiciary or National Parliament.

12. Self Direction Skills

There is a need of monitoring one's own learning needs and transferring learning from one domain to another. Also one should have the skill of locating appropriate resources. Each one of us has to pave our own paths. There are rare learning resources and guides to guide us. We need to identify our own paths while stepping in. It is because of faster obsolescence of coping skills and knowledge.

13. Social Responsibility Skills

Everyone should act responsibly and demonstrate ethical behaviour in personal life, work place, community and society. We are yet to find meaning with local citizenship before advocating global citizenship.

14. Human Relation Skills

Every one , every where, under all sorts of conditions should observe decency, decorum and discipline. There should be sharing with politeness. There should be fellow feeling and empathy. There should be coexistence with peace and harmony. For this self-discipline and empathy with the others' view points are the necessary conditions.

15. Emotional Skills

Most of us presume to know our strengths but are seldom conscious of the weaknesses. There is a need to be thoroughly aware of the self. There is a need to learn self management. We should sustain our social sensitivity and learn social management. Growing complexities of the 21st Century immediately demand self awareness & self management, social sensitivity & social management.

16. Human Development Climate Skills

There is a need to develop Human Development Climate Skills, such as, Trust, Risk Taking, Openness, Reward, Responsibility, Support, Feedback, Team Spirit and Collaboration. Owing to growth pressure there is a heavy emphasis on material well being leading to nuclear and finally fragmented family as an institution. The filial affection and empathy and compassion are weaning out. While man has to work as an organization, either he/she or the organization or both ought to make an attempt to create these values so as to work in cohesion.

17. Spiritual Intelligence Skills

Material attainment of any level has to be subservient to the spiritual attainment leading to the understanding of the self at the highest level of super sub-consciousness. Spirituality, Knowledge of Soul, Quest for Life Values, Conviction, Commitment & Character, Healthy State in Happiness and Distress, Brotherhood, Equality, Acceptance and Empathy, Love & Compassion, Flexibility, Leadership in Educational Change ought to be the natural features of every human being.

18. Innovation, Creation & Construction Skills

Dancing Crops, Flowing Wisdom, Enchanting Music, Touching Songs, Resonating Dance, Immersing Verses, Speaking Sculptures, Enlightened Learners, and Innovative Researchers are the wonderful Springs of Nature. Such skills need to be scaled up.

19. Wholistic Education Skills

Wholistic Education should focus on knowledge of the discipline, inter-disciplinarity, Environmental Attitude, Health development, Emotional Development, Spiritual Development and integrated development.

20. Inter-disciplines

Many a interdisciplinary Programs have come up, such as, Bio-Chemistry, Bio-Technology, Microbiology, Bio-informatics, Bio-Physics, Bio-Statistics, Genetics. Choice Base Credit System is being introduced throughout to realize inter-disciplines.

21. Value Integrated Education

Education should be character building. Education should be governed by Human Relations Model, rather than by traditional, hierarchical, bureaucratic model. Education should create global communities for sharing their states through reflective dialogues. Higher Education should harness the Power of Science & Technology for realizing Cultural Excellence.

22. Technology Integrated Education

There is technological revolution in Education. There is a shift from Online Learning to Twitters, Face-book to Semantic Web. There is a quick shift from Web-1 to Web-2 to Web-3 technology. Smart Classrooms are emerging. Wi-Fi, i-Pad, e-book, e-Reader, e-News Letter and Webinars are emerging. There is a need to realize Technology Integrated Education.

23. Digital Age Skills

Digital Age Skills have become the basic needs of the present century, such as, Global Awareness Skills- Understanding of how corporations and communities all over the world are interrelated, Cultural Literacy Skills- Appreciation of diversity of cultures, ICT Skills- Ability to find, analyze, evaluate and make appropriate use of information, Scientific Literacy Skills- understanding of both theoretical and practical aspects of Science, and Functional Literacy Skills- Use of Information & Knowledge for living healthy, happy, meaningful and long life.

24. Yoga Skills

Yoga should be essential in Education Curricula. There should be adequate inputs and practice on

- Yama or Eternal Vows: Ahimsa, Satya, Asteya, Aprigraha & Brahmacharya
- Niyama or Observances: Saucha, Santosha, Tapas, Savdhyaya, Ishvara-pranidhana
- Asana: Firm, Comfortable Meditative Posture
- Pranayama: Regulation of the Vital Force
- Pratyahara: Sense withdrawal
- Dharna : Concentration
- Dhyana : Meditation
- Samadhi : Absorption

Rationale of the Study

Educational Skills emerge scientifically through problem specific theorization, instantaneously. Now the question is have various skills been integrated in Teacher Education scientifically & comprehensively. 21st century conditions demand skills for healthy, peaceful, harmonious, meaningful and full living under highly complex socio-cultural-political-economic-demographic and environmental conditions. Skill is the Science applied artistically or art applied scientifically, precisely, easily, joyfully, cost effectively. It demands perfect, instantaneous coordination of mind and motor muscles patiently & passionately. Education ought to be science based, skill based and technology integrated. The present paper attempts to explore the status of Education Scholars on various skills.

Objectives of the Study

1. To study the perceptions of Ph.D. Scholars on Educational Skills.
2. To study the relative status of Ph.D. Scholars in Education on various skills.
3. To study the comprehensive profile of Ph.D. Scholars on various skills.

Sample for the study

Sample for the study is constituted of 15 Ph.D. Scholars available at CASE on the date of data collection.

Tools & Techniques Employed

A Skill Status Inventory was constructed by the investigators on 25 Skills, having 179 items against 5 point scale- Very Often, Often, Sometimes, Rarely, Never, as follows:

Skill Status Inventory: Skills & Items

SNO	Skill	Number of Items
1	Info-Savvy Skill (ISS)	8
2.	Techno-Pedagogic Skill (TPS)	22
3	Techno-Management Skills (TMS)	9
4	Techno-Special Skills (TSS)	15
5	Techno-Living Skills (TLS)	11
6	Accountability & Adaptability (A&A)	4
7	Communication Skill (CS)	2
8	Critical Thinking & Systems Thinking (CT&ST)	3
9	Information and Media Skills (I & MS)	2
10	Interpersonal & Collaborative Skill (IP&CS)	5
11	Problem Solving(PS)	3
12	Self Direction (SD)	3
13	Social Responsibility (SR)	4
14	Human Relations Skills (HRS)	5
15	Emotional Skills (ES)	4
16	Life Skills (LS)	7
17	Adjustment Skills (AS)	5
18	Human Development Climate Skills (HDCS)	9
19	Spiritual Intelligence Skill (SIS)	9
20	Research & Construct Skills (R&CS)	12
21	Management Skill (MS)	10
22	Citizenship Skills (CZS)	7
23	Wholistic Education Skills (WES)	6
24	Digital Age Skills (DAS)	6
25	Yoga Skills (YS)	8
26	Total Items	179

Data Collection

The Skill Status Inventory was administered on the available 15 Education Scholars. They registered their responses against 5 point scale.

Data Analysis

The data were analyzed in terms of frequencies and % responses, skill-wise and over all. Objective-wise data analysis is presented as follows:

A. Perception of the Scholars on Educational Skills

Table-1: Perception of the Scholars on Educational Skills

SSNO	Response
1	All the skills are essential to lead the life. Skills should be properly used, timely adopted when and wherever required to achieve our life objectives. Media skills are useful for getting information, Techno-Pedagogic Skills to save time and presenting/providing contents effectively, Emotional Skills are useful for managing self, whereas, Spiritual and Yoga Skills show path to lead healthy and happy life.
2	I believe that different kind of skills can make a person happy, healthy, interactive, cooperative, eco-friendly and global. Techno-savvy skills make a person interactive with a machine, a human and the environment. Info-savvy skills keep a person up-to-date with latest, reliable and authentic information. Life skills help a person in dealing with life situations. Spiritual and Yoga Skills help in self realization and stress reduction. ICT based curriculum has already been introduced in education by the government. It is the duty of teachers to develop such kind of skills in them and students. Through Techno-Pedagogic skills teaching-learning becomes more interactive. Through environmental awareness skills, a person becomes more eco-friendly.
3	Over all, I can say that info-savvy skills, techno-pedagogic skills, techno-management skills have been very useful to me in teaching of English language. The life skills like communication skills, critical thinking, and system thinking, interpersonal and collaborative skills, problem solving skills, human relations skills are required to survive in this competitive world. I want to improve the yoga skills, social responsibility skills, and information and media skills.
4	I use skills as per my understanding and requirement. All skills are important and necessary in life. But, acquisition of skills depends on requirement and capability. I can manage my work, I can take my stand, I can express my views easily. I can use different media and modes.
5.	As I am average on knowledge of techno-pedagogic skills, I need to improve such skills through which the future problems related to my career/profession can be resolved. With respect to info-savvy skills I can realize what kind of information is needed and what are the sources for obtaining information. I am relatively poor at emotional skills and yoga skills.
6	According to the present conditions of my life, I am best using my social skills and trying to cope up with the emotions arising out of these situations. In doing so I am taking help of my friends. In my professional life, I use collaborative & cooperative skills to formulate my problems and analyze them. All in all I think I am learning new social, emotional and cultural skills which help me to lead a good life. About techno-pedagogic and info-savvy skills, I am using them more now compared to earlier days. Thus, I can say that soon I may become a better techno-savvy & info-savvy person.

SSNO	Response
7	I am good at human relationship skill and social responsibility skills, but often, I am not in a position to convey my intention at right time or in correct form
8	I feel confident to use various skills, such as, problem solving, social skills and management skills. I feel some skills are needed for adjustment as per conditions and surrounding atmosphere.
9	I am developing my skills through practice and experience. Skills are very much essential in my life, every time through which, I can satisfy myself in a variety of ways.
10	Yes, skills are very important in life. The skillful life is happy life and to lead a life successfully we need to integrate all of these skills and many other skills in all day- to- day activities. I personally need to develop in techno-pedagogic skills and yoga skills. I believe that, I can manage and lead successful life with the different skills, namely, communication, management, emotional, wholistic, human development, spiritual skills and others also. Still, we need to enrich and there is always scope for development and advancement. So, I think I learn one or the other skill every day and implement and practice in my personal, social and professional life.
11	I can control emotions and practice life skills in daily life. I can have spiritual intelligence skills. I also practice, adjustment skills and communication skills. Management skills are also important for every individual.
12	Many of the skills mentioned, I have not experienced in my life due to not having experience of working in any organization. I can adjust with others very comfortably. I can communicate with students and others comfortably. Little weak in emotional skills. I can manage myself for having better future life. Not experienced much technologically, such as, info-savvy skills, but capable of doing good work in those areas. I can identify and solve problems from personal, social, as well as, research areas. I have average critical thinking and creative skills.
13	Some skills are inborn, whereas, some are acquired and mastered. I feel many of the skills can be explored and mastered in life. ICT related skills need good exposure and practice. Some skills like adjustment skills, spiritual skills, life skills, need a base within self and if we have a good base, that is, good atmosphere provided, it becomes easy for one to explore and enrich such skills.
14	I rate myself four on a five point scale in management skills, citizenship, educational skills, life skills, adjustment skills, but only one in techno-pedagogic skills & info-savvy skills. I need to polish & elaborate more on these skills related to technology. In future, these skills can be incorporated for a better healthy and spiritual growth.
15	In today era techno-management skills and info-savvy skills are necessary for every one, though many a people are not aware of these skills. Life skills, too, are essential for every one.

B. Relative status of the scholars on various skills

Table-1: Skill Status of the Scholars on various skills

Scholar Skill	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Max. Score
ISS	31	38	32	25	27	27	35	27	31	39	32	31	32	29	34	40
TPS	74	97	85	74	76	69	98	59	82	101	92	88	97	76	86	110
TMS	26	37	29	23	29	11	16	37	42	42	36	15	31	14	23	45
TSS	58	60	52	63	60	31	44	47	57	63	64	24	43	27	34	75
TLS	26	45	44	42	34	41	40	33	53	46	42	30	44	29	47	55
A&A	16	15	16	15	13	19	18	13	16	20	18	11	16	13	16	20
CS	8	8	8	6	6	10	8	10	9	10	9	7	8	7	7	10
CT & ST	10	12	13	10	11	12	15	8	15	14	11	10	11	9	11	15
I & MSs	8	10	8	8	8	7	10	7	10	10	7	8	8	8	9	10
I & CS	19	23	22	20	17	20	21	19	25	25	22	19	25	20	18	25
PS	12	14	13	12	12	12	13	15	15	15	14	12	11	13	14	15
SD	15	12	12	12	10	9	13	12	15	15	13	12	12	11	14	15
SR	20	19	16	16	16	15	19	20	17	20	20	17	20	16	18	20
HRS	20	22	20	16	16	20	24	18	25	25	22	23	25	16	25	25
ES	19	16	16	16	16	13	14	20	20	20	19	17	18	14	16	20
LS	31	26	28	28	25	25	24	27	35	33	28	28	30	24	29	35
AS	20	21	20	15	19	22	20	22	25	25	22	22	24	20	19	25
HDCS	35	36	36	35	36	43	40	45	44	45	43	38	41	43	44	45
SIS	37	40	42	35	31	37	38	42	45	45	45	41	43	43	43	45
R&C S	55	54	48	45	43	50	60	56	56	59	54	49	51	47	58	60
MS	42	37	39	39	40	32	42	42	42	50	44	33	41	44	38	50
CS	31	30	28	27	24	26	33	28	33	34	26	26	30	28	25	35
WES	24	24	24	24	23	21	29	20	19	24	25	23	28	27	30	30
DAS	19	22	24	19	22	16	28	20	23	26	20	22	24	28	25	30
YS	27	18	24	24	24	28	23	21	29	32	21	19	27	22	27	40
OSS	683	736	699	649	638	616	725	668	783	838	749	625	740	628	710	895

B. Relative Status of the Research Scholars on Various Skills

It is evident through Table-1 that the

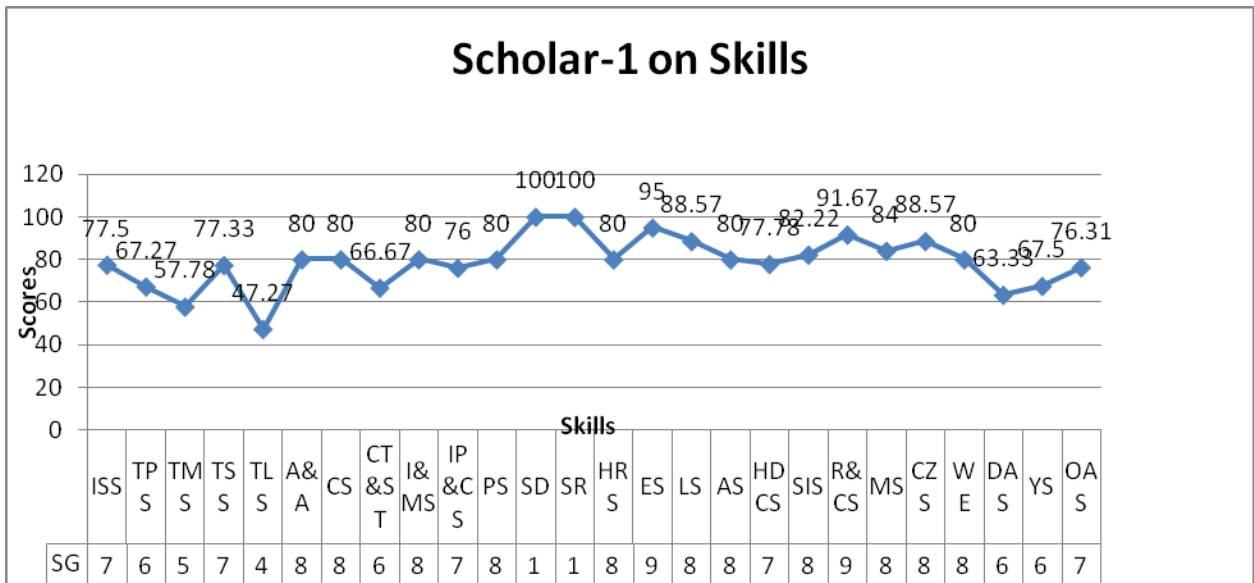
- A. maximum score obtained on info-savvy skills is 38 out of 40, whereas, minimum score obtained is 25. the mode is 31, whereas, the mean score is 31.33.
- B. maximum score obtained on Techno-Pedagogic Skills is 101 out of 110, whereas, minimum score obtained is 59. the mode is 74, whereas, the mean score is 83.6.
- C. maximum score obtained on Techno-Management Skills is 42 out of 45, whereas, minimum score obtained is 11. the mode is 37, whereas, the mean score is 27.4.

- D. maximum score obtained on Techno-Special Skills is 64 out of 75, whereas, minimum score obtained is 24. the mode is 60 whereas, the mean score is 48.47.
- E. maximum score obtained on Techno-Learning Skills is 53 out of 55, whereas, minimum score obtained is 26. the mode is 44, whereas, the mean score is 39.73.
- F. maximum score obtained on Adaptability & Accountability Skills is 20 out of 20, whereas, minimum score obtained is 11. the mode is 16, whereas, the mean score is 15.67.
- G. maximum score obtained on Communication Skills is 10 out of 10, whereas, minimum score obtained is 6. the mode is 8, whereas, the mean score is 8.06.
- H. maximum score obtained on Critical Thinking & Systems Thinking Skills is 15 out of 15, whereas, minimum score obtained is 8. the mode is 11, whereas, the mean score is 11.46.
- I. maximum score obtained on Information & Media Skills is 10 out of 10, whereas, minimum score obtained is 7. the mode is 8, whereas, the mean score is 8.4.
- J. maximum score obtained on Interpersonal & Collaborative Skills is 25 out of 25, whereas, minimum score obtained is 17. the mode is 19, whereas, the mean score is 21.
- K. maximum score obtained on Problem Solving Skills is 15 out of 15, whereas, minimum score obtained is 11. the mode is 12, whereas, the mean score is 13.13.
- L. maximum score obtained on Self Direction Skills is 15 out of 15, whereas, minimum score obtained is 9. the mode is 12, whereas, the mean score is 12.46.
- M. maximum score obtained on Social Responsibility Skills is 20 out of 20, whereas, minimum score obtained is 9. the mode is 20, whereas, the mean score is 17.93.
- N. maximum score obtained on Human Relations Skills is 25 out of 25, whereas, minimum score obtained is 16. the mode is 25, whereas, the mean score is 21.13.
- O. maximum score obtained on Emotional Skills is 20 out of 20, whereas, minimum score obtained is 13. the mode is 16, whereas, the mean score is 16.93.
- P. maximum score obtained on Life Skills is 35 out of 35, whereas, minimum score obtained is 24. the mode is 28, whereas, the mean score is 28.06.
- Q. maximum score obtained on Adjustment Skills is 25 out of 25, whereas, minimum score obtained is 15. the mode is 20, whereas, the mean score is 21.06.
- R. maximum score obtained on Human Development Climate Skills is 45 out of 45, whereas, minimum score obtained is 35. the mode is 36, whereas, the mean score is 40.26.
- S. maximum score obtained on Spiritual Intelligence Skills is 45 out of 45, whereas, minimum score obtained is 31. the mode is 45, whereas, the mean score is 40.46.
- T. maximum score obtained on Research & Construct Skills is 60 out of 60, whereas, minimum score obtained is 43. the mode is 54 whereas, the mean score is 40.46.

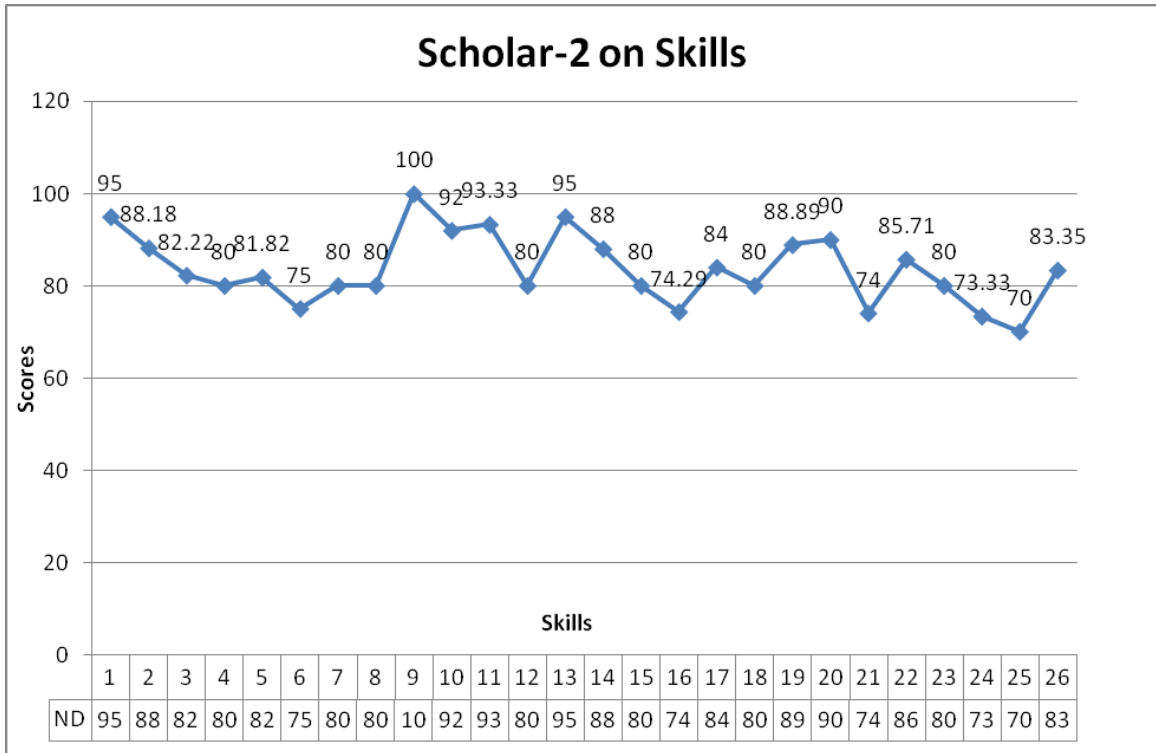
- U. maximum score obtained on Management Skills is 50 out of 50, whereas, minimum score obtained is 32. the mode is 42 whereas, the mean score is 40.33.
- V. maximum score obtained on Citizenship Skills is 34 out of 35, whereas, minimum score obtained is 24. the mode is 28 whereas, the mean score is 28.6.
- W. maximum score obtained on Wholistic Education Skills is 30 out of 30, whereas, minimum score obtained is 19. the mode is 24, whereas, the mean score is 24.33.
- X. maximum score obtained on Digital Age Skills is 28 out of 30, whereas, minimum score obtained is 16. the mode is 22, whereas, the mean score is 22.53.
- Y. maximum score obtained on Yoga Skills is 32 out of 40, whereas, minimum score obtained is 19. the mode is 27, whereas, the mean score is 25.06.
- Z. *the maximum score obtained on Over All Skills is 838 out of 895, whereas, minimum score obtained is 616. The mean score is 699.8, whereas, there is no occurrence of mode.*

Profiles of Scholars on Various Skills

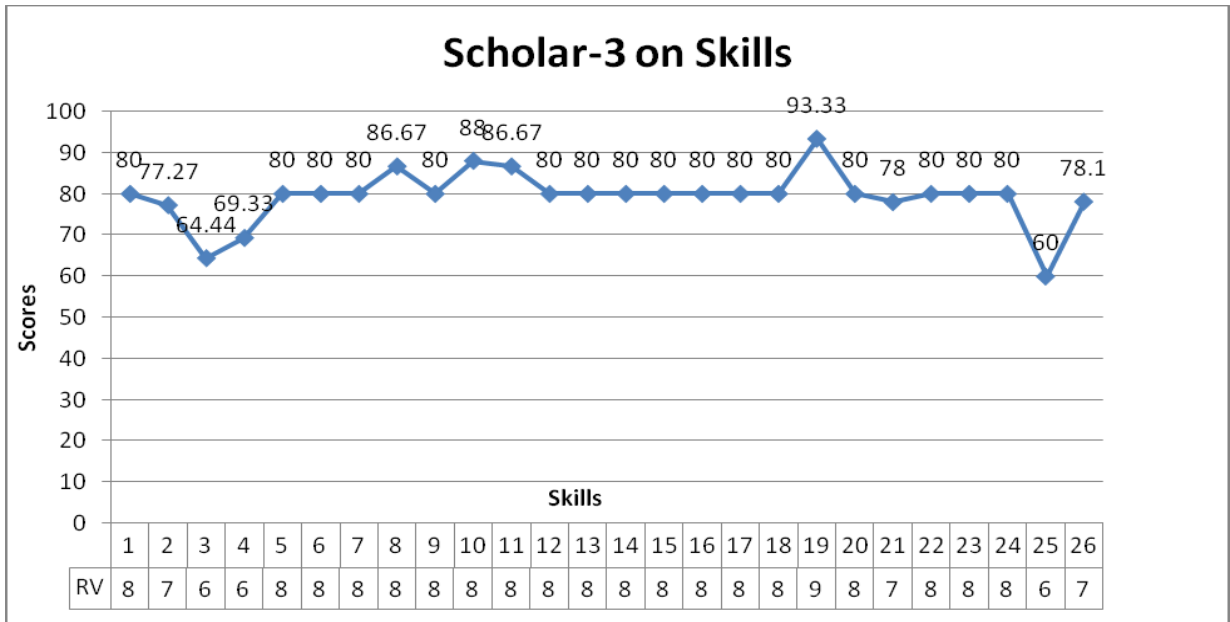
B. Comprehensive Profile of the Research Scholars on Skills



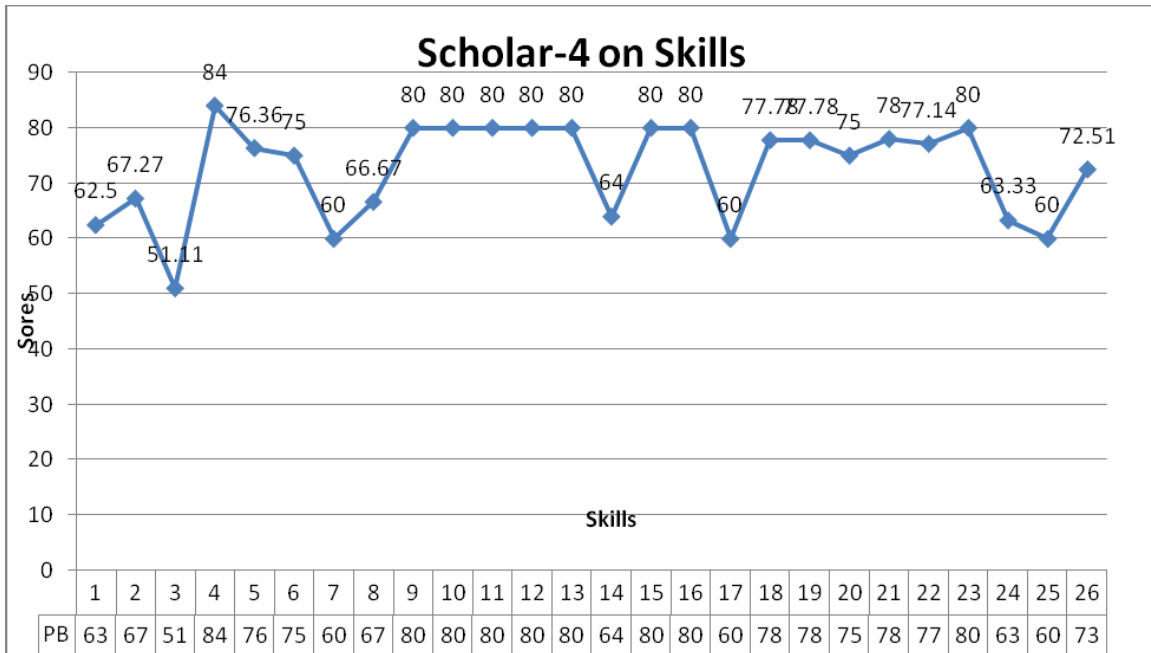
Scholar-1 has got the highest score on Self Direction and Social Responsibility Skills. Next in the series are Emotional Skills, Research & Construct Skills, Life Skills and Citizenship Skills. He is relatively low on Techno-Living Skills, Techno-Management Skills, Digital Age Skills, Yoga Skills, Info-Savvy Skills.



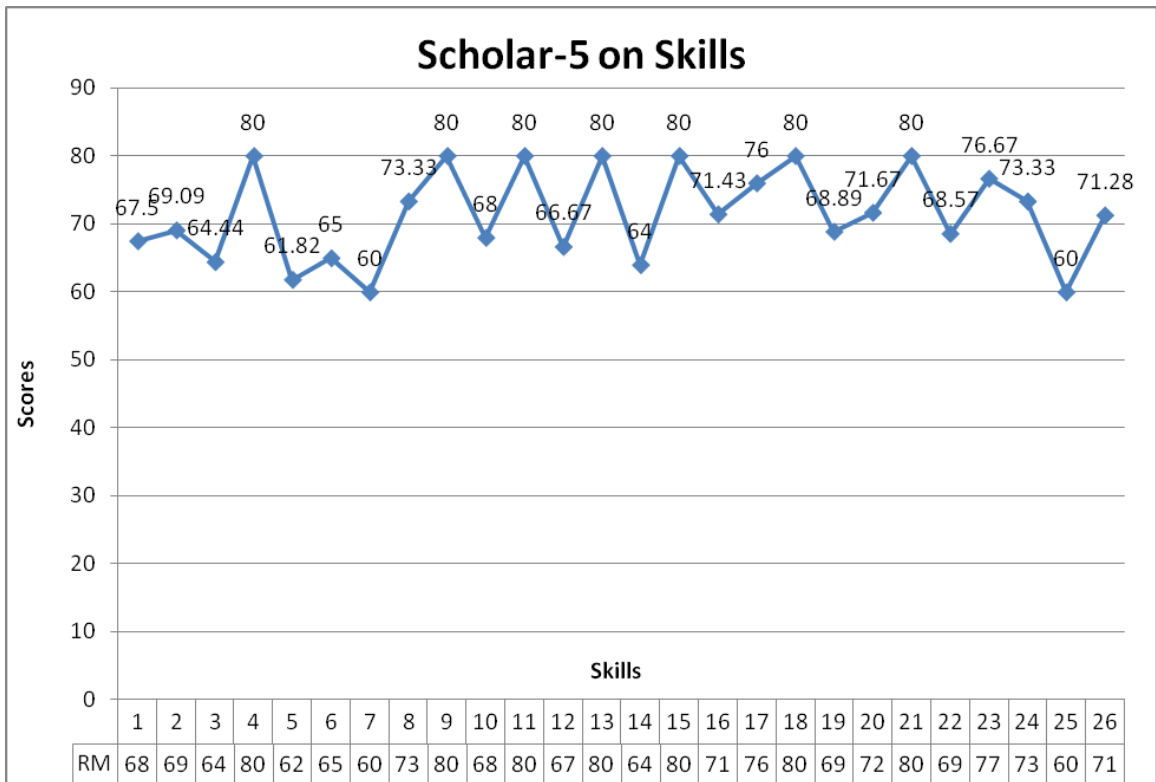
Scholar-2 is highest on Information & Media Skills. Next in the series are info-savvy skills and social responsibility skills. She has been found lowest on the yoga skills. Next in the series are digital age skills and wholistic education skills.



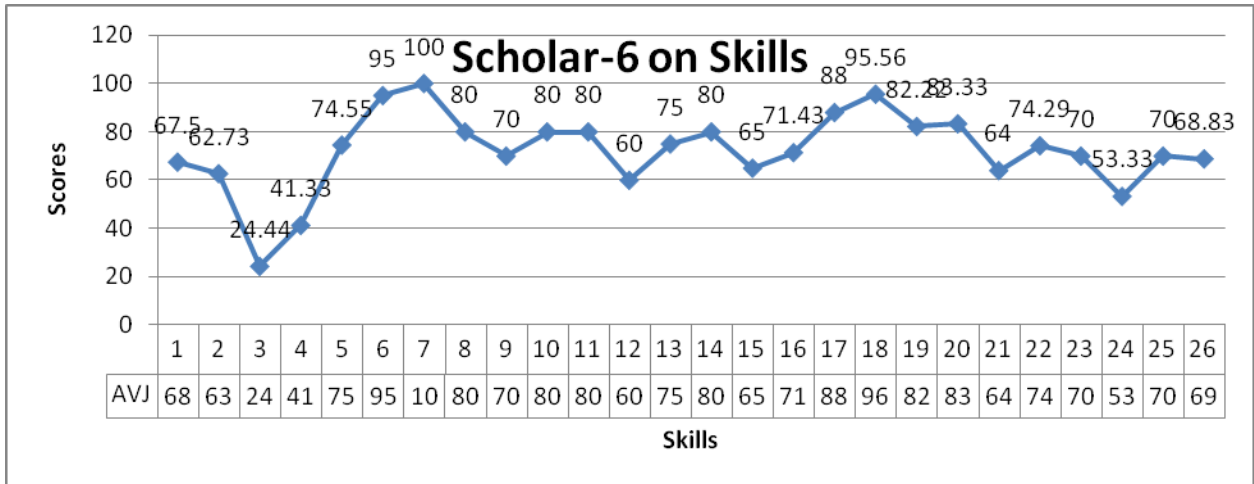
Scholar-3 has been found highest on the Information and Media Skills. Next in the series are info-savvy skills and social responsibility skills. He has been found lowest on the Yoga Skills. Next in the series are digital age skills and management skills.



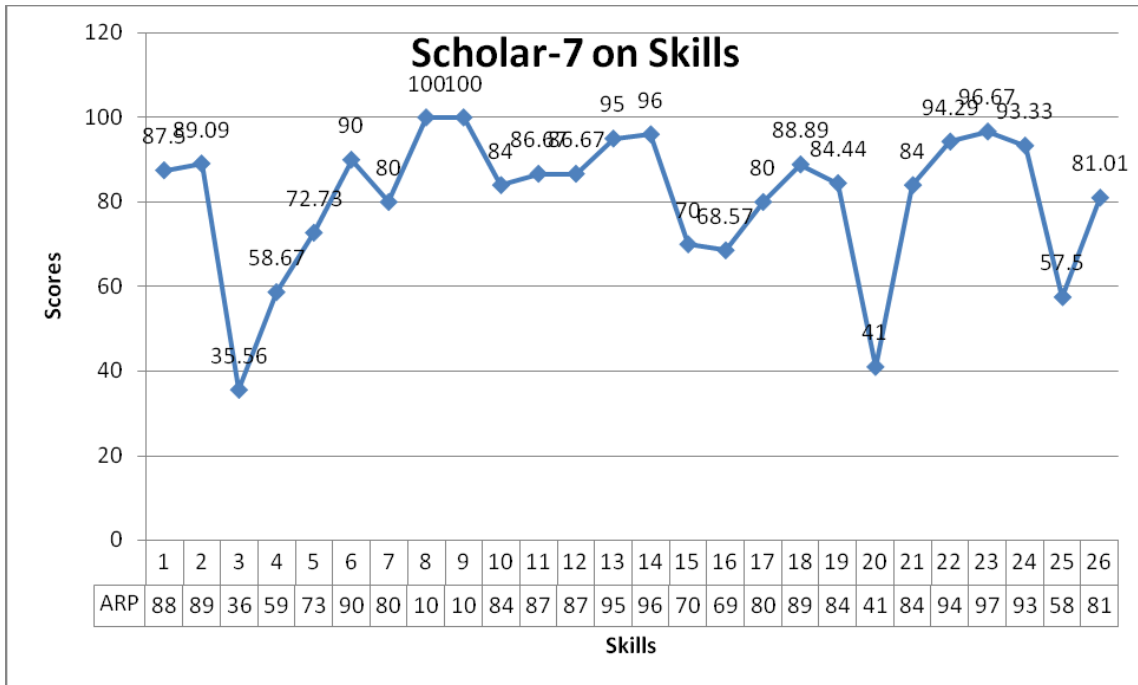
Scholar-4 has been found highest on the Techno-Special Skills. Next in the series are Information & Media Skills, Interpersonal & Communication Skills, Problem Solving Skills, Self Direction Skills, Emotional Skills, Life Skills and Wholistic Education Skills. She has been found lowest on the techno-management skills. Next in the series are communication skills, adjustment skills, and yoga skills.



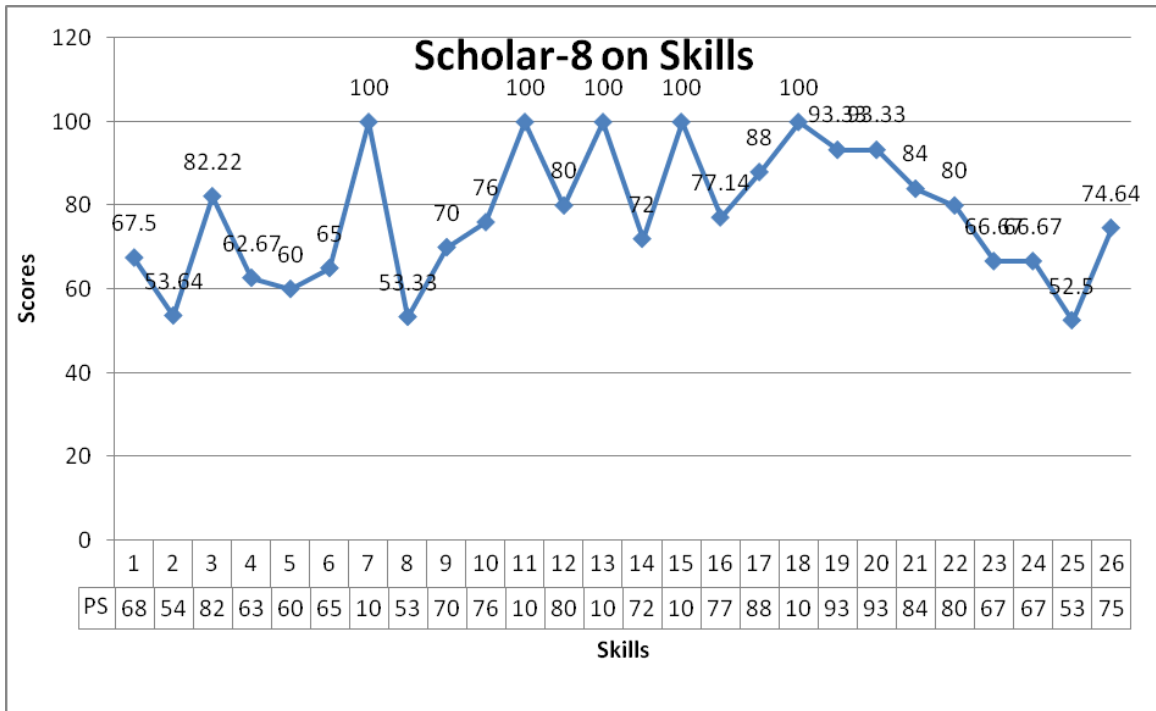
Scholar-5 has been found highest on Techno-Special Skills, Information and Media Skills, Problem Solving Skill, Social Responsibility Skill, Emotional Skills, Human Development Climate Skills, and Management Skills. He has been found lowest on communication skills and Yoga Skills.



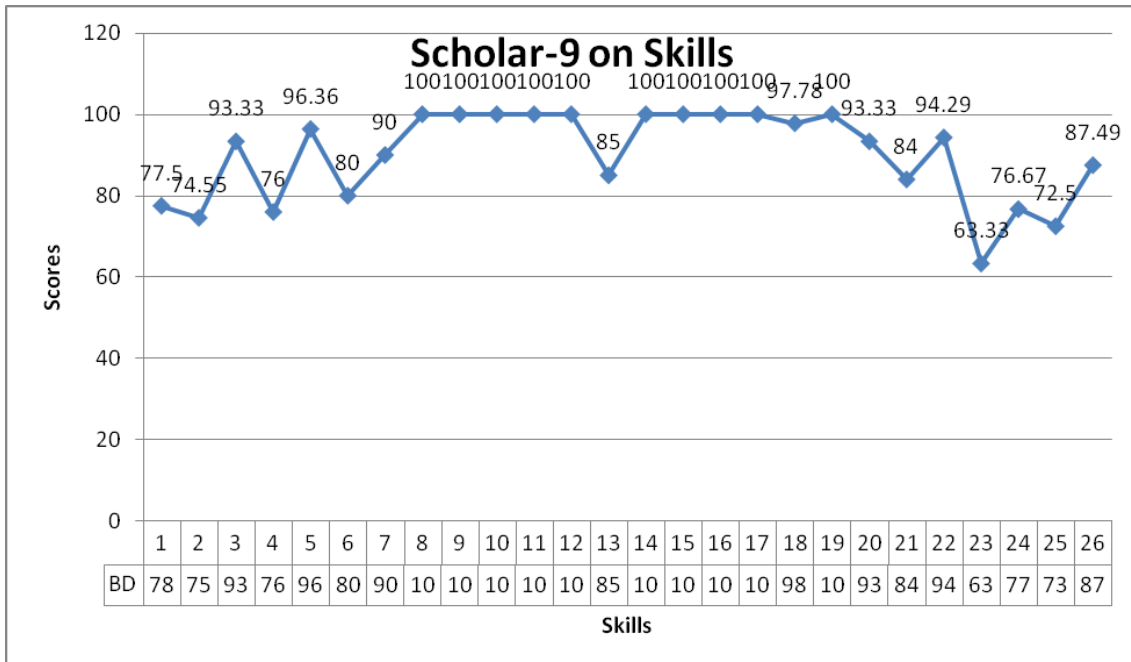
Scholar-6 has been found highest on Communication Skill. Next in the series are, Human Resource Development Climate, and Adaptability & Accountability. She is lowest on the Techno-Management Skill. Next in the series are Techno-Special Skills, Digital Age Skills and Self-Direction Skills.



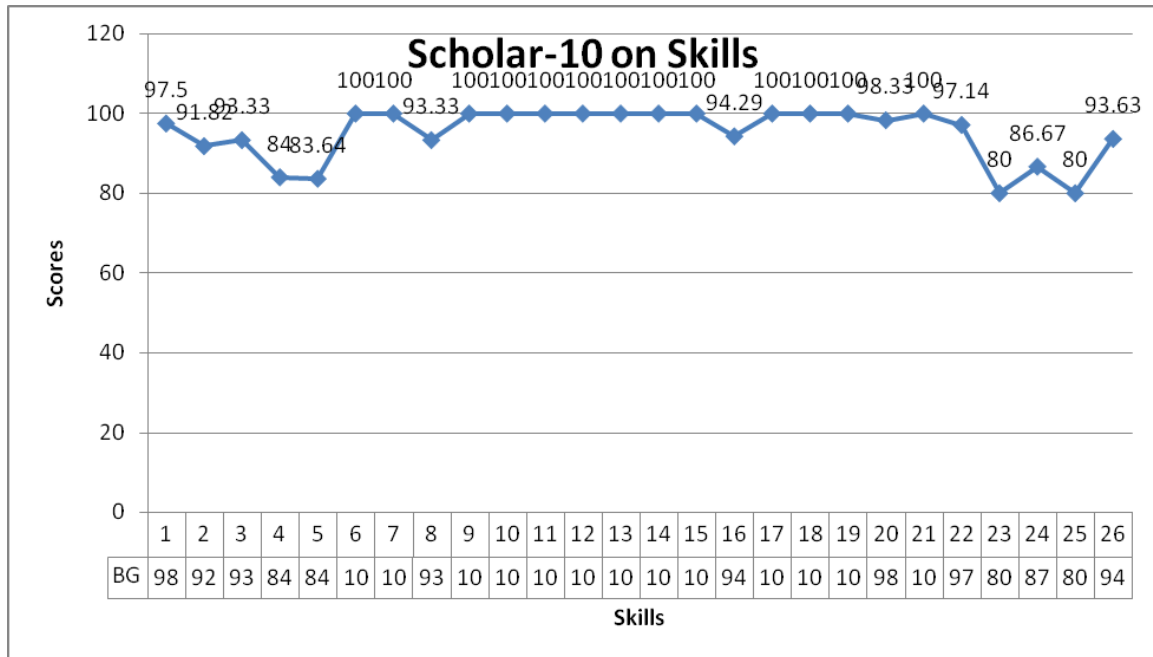
Scholar-7 is highest on Critical Thinking & Systems Thinking and Information & Media Skills, Whereas, he is lowest on Techno-Management Skills and Research & Construct Skills.



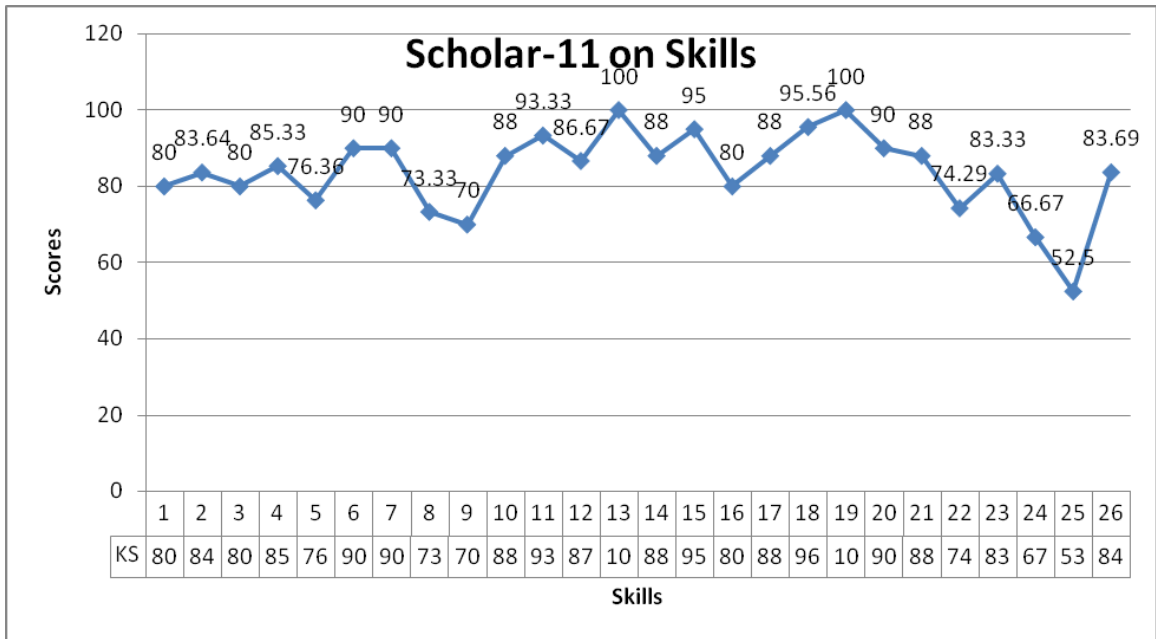
Scholar-8 is highest on Communication Skills, Problem Solving, Social Responsibility, Emotional Skill and Human Development Climate Skill. She has been found lowest on Yoga Skill and Critical Thinking & Systems Thinking Skill.



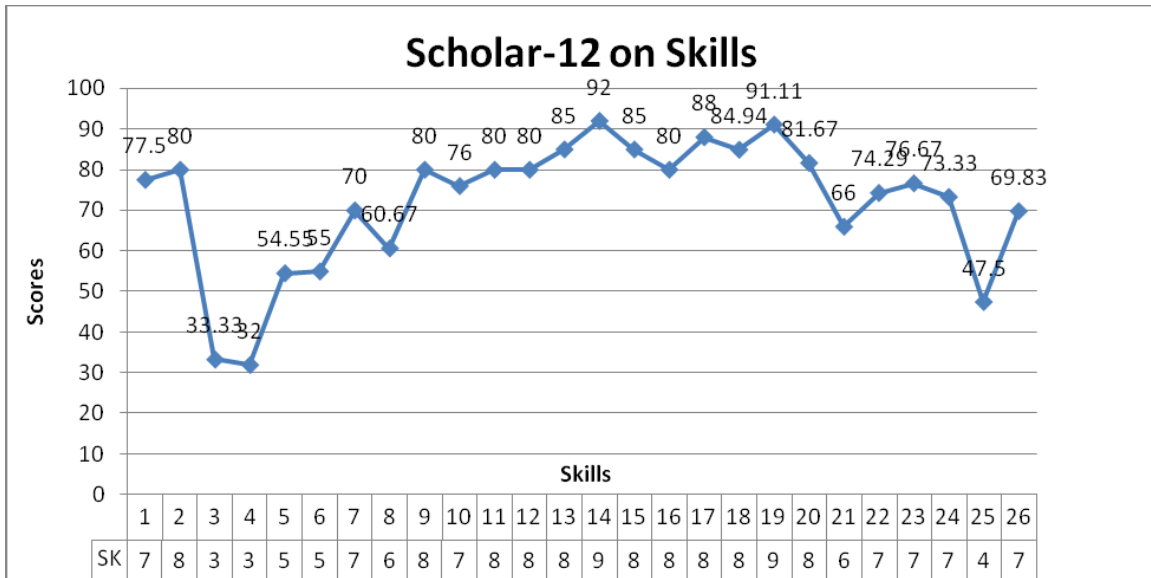
Scholar-9 has been found highest on Critical Thinking & Systems Thinking Skill, Information & Media Skill, Problem Solving Skill, Self Direction Skill, Social Responsibility Skill, Emotional Skill, Life Skill, Adjustment Skill, Human Development Climate Skill, Spiritual Intelligence Skill and Management Skill. He has been found lowest on Wholistic Education Skill, Yoga Skill, Techno-Pedagogic Skill and Techno-Special Skill.



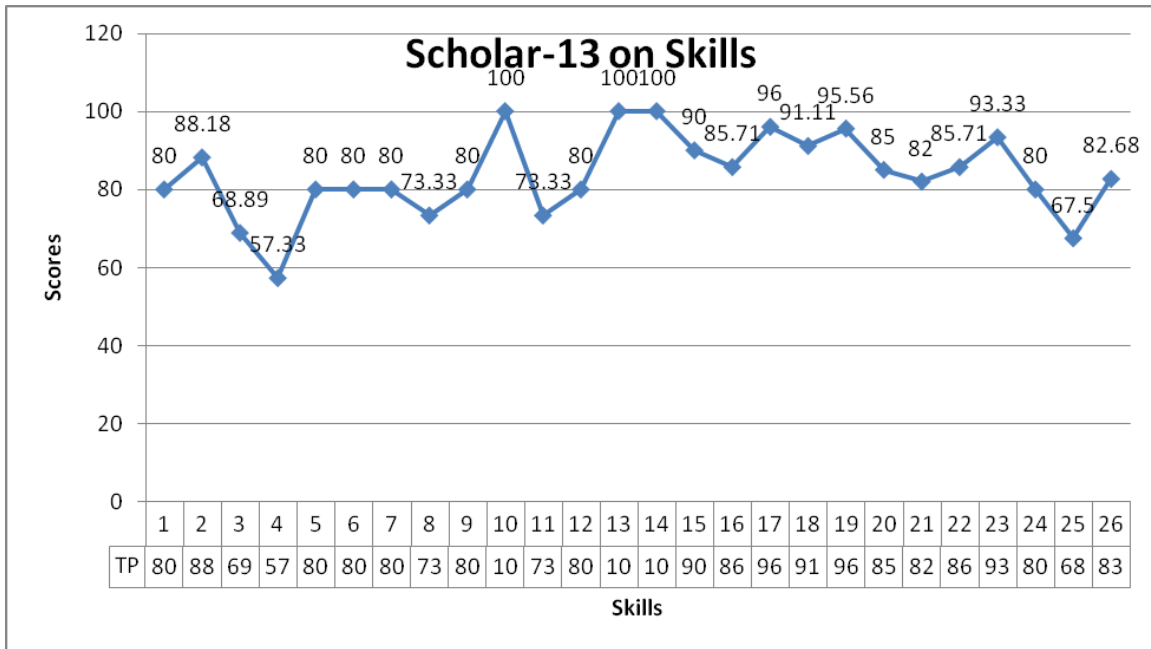
Scholar-10 has been found highest on Adaptability & Accountability Skill, Communication Skill, Information & Media Skill, Problem Solving Skill, Self Direction Skill, Social Responsibility Skill, Human Relations Skill, Emotional Skill, Life Skill, Adjustment Skill, Human Development Climate Skill, Research & Construct Skill and Citizenship Skill. She has been found lowest on Wholistic Education Skill, Yoga Skill, Techno-Special Skill & Techno-Living Skill.



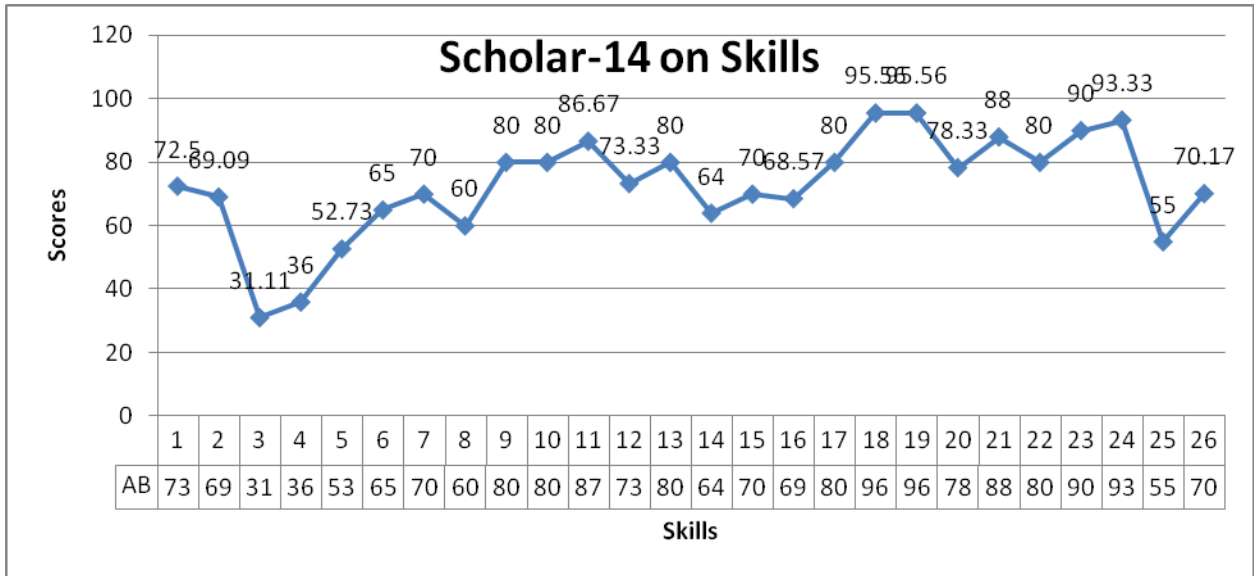
Scholar-11 has been found highest on Social Responsibility Skill and SIS. He has been found lowest on Yoga Skill, Digital Age Skills, Information & Media Skill, Critical Thinking & Systems Thinking Skill and Citizenship Skills.



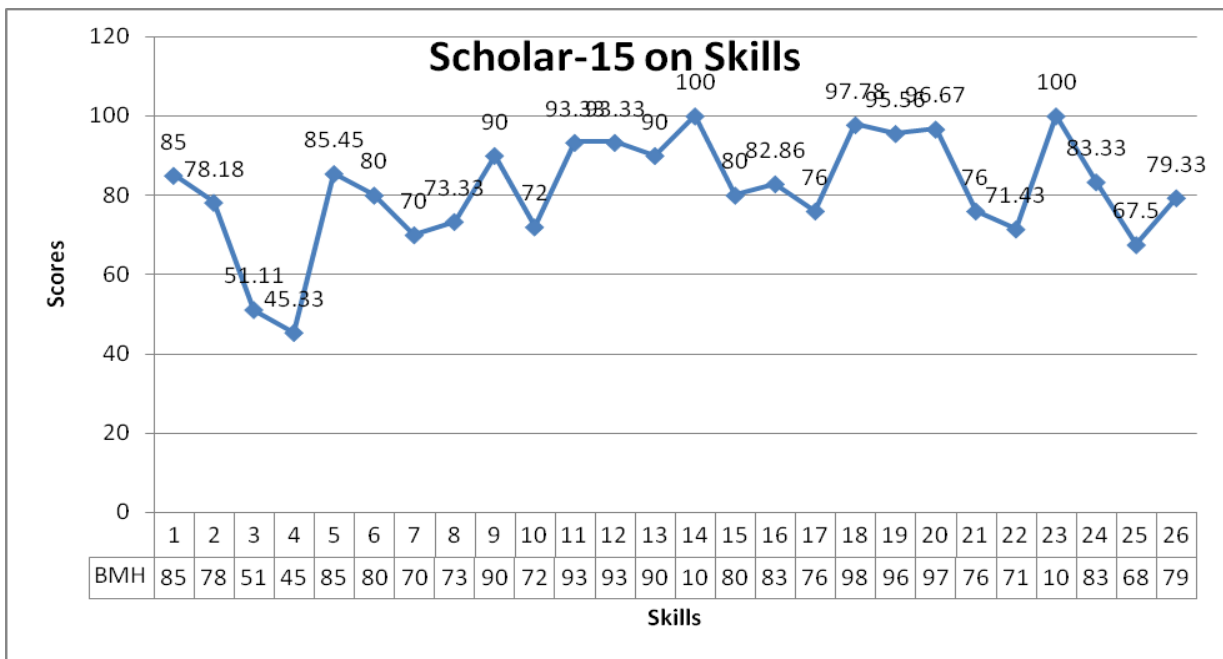
Scholar-12 has been found highest on (HRS) Human Relationship skill, SIS and he has been found lowest on Techno Special Skills, Techno-Management Skills and Yoga Skills.



Scholar-13 has been found highest on Inter-personal & Community Skills. Next skills in the series are social responsibility skills and Human Relations Skill. She has been found lowest on Techno-Special Skills. Next skills in the series are Yoga Skills and Techno-Management Skills.



Scholar-14 has been found highest on Human Development Climate Skills and Spiritual Intelligence Skills, whereas, lowest on Techno-Management Skills and Techno-Special Skills.



Scholar-15 has been found highest on Wholistic Education Skills. Next in the series are Human Development Climate Skills and Research & Construct Skills. She has been found lowest on Techno-Special Skills and Techno-Management Skills.

Epilogue

The Scholars have made very meaningful perceptions on the Educational Skills. There is no mode on the over all status of the skills of the Scholars, that is, no two Scholars were found to have same overall skill level. Scholar-10 has been found highest on the Educational Skills. Next in the sequence are Scholars- 9, 11, 13, 2, 7, 15, 3, 1, 8, 4, 5, 14, 12 and 6. Scholar-10 thinks that he/she is highest on Adaptability & Accountability and Communication, whereas, relatively low on Wholistic Education and Techno-Special Skills. Scholar-9 finds himself/herself highest on Critical Thinking & Systems Thinking, whereas, relatively low on Yoga Skills and Wholistic Education. Scholar-11 is highest on Social Responsibility Skills and Spiritual Intelligence, whereas, relatively low on Digital Age Skills and Yoga Skills. Scholar-13 thinks that she/he is highest on Interpersonal & Community Skills and Social Responsibility Skills, whereas, relatively low on Techno-Special Skills and Yoga Skills. Scholar-2 has been found highest on Information & Media Skills and Info-Savvy Skills, whereas, low on Yoga and Management skills. Scholar-7 has been found highest on Critical Thinking & Systems Thinking and Information & Media skills, whereas, relatively low on Techno-Management and Research & Construct Skills. Scholar-15 has been found highest on Wholistic Education and Human Development Climate Skills, whereas, relatively low on Techno-Special Skills and Techno-Management Skills. Scholar-3 has been found highest on Information & Media Skills and Info-Savvy Skills, whereas, lowest on Yoga Skill and Digital Age Skills. Scholar-1 has been found highest on Self Direction and Social Responsibility skills, whereas, relatively low on Techno-Living & Techno-Management skills. Scholar-8 has been found highest on Communication and Problem Solving, whereas, relatively low on Yoga and Critical Thinking & Systems Thinking. Scholar-4 has been found highest on Techno-Special Skills and Information & Media Skills, whereas, relatively low on Techno-Management and Communication Skills. Scholar-5 has been found highest on Techno-Special Skills and Information & Media Skills, whereas, relatively low on Communication Skills and Yoga Skills. Scholar-14 has been found highest on Human Development Climate Skills and Spiritual Intelligence Skills, whereas, relatively low on Techno-Management and Techno-Special Skills. Scholar-12 has been found highest on Human Relations Skills and Spiritual Intelligence Skills, whereas, relatively low on Techno-Management and Techno-Special skills. Scholar-6 has been found highest on Communication Skills and Human Resource Development Climate, whereas, relatively low on Techno-Management and Techno-Special Skills. The Scholars have been found to have varied profiles on educational skills. On some skills higher, on some lower, whereas, on the other skills in between.

The scholars who philosophise at doctoral level in various disciplines ought to immerse themselves in their realm fully. Education Scholars by virtue of their discipline have to be wholistic. It is evident from the idiographs that some scholars are higher on Information & Media Skills, Info-Savvy Skills, Technopedagogic skills, but lower on Yoga Skills, and Techno-Management Skills. Some scholars who are higher at Self Direction Skill and Social Responsibility Skills are lower on Techno-Living Skill. The scholar who has been found highest over all and on Adaptability & Accountability Skill,

Communication Skill, Information & Media Skill, Problem Solving Skill, Self Direction Skill, Social Responsibility Skill, Human Relations Skill, Emotional Skill, Life Skill, Adjustment Skill, Human Development Climate Skill, Research & Construct Skill and Citizenship Skill, has been found relatively low on Wholistic Education Skill, Yoga Skill, Techno-Special Skill & Techno-Living Skill and inbetween on crirtical thinking & systems thinking and life skills. It is desirable that all the scholars have all the educational skills at the optimum level. As, a whole the skill scenario of the scholars has been found to be promising. But, there is always scope for perfection. We should be in a position to employ any skill timely, easily, precisely and joyfully. But, how to realize this vision?

The complexities of the living conditions demand skillful persons in various dimensions of life. All the skills have their on significance. Info-Savvy & Digital Skills are as important as Spiritual Intelligence and Yoga Skills. Self Awareness Skills are as important as Systems Thinking Skills. Production Skills are as important as Consumption Skills. Zooming out is as important as Zooming in. Personal Skills are as significant as Citizenship Skills. General as well as Special Skills have their own value. Research is as important as Construction. Downloading is as important as uploading. How can life be a network of arrays of innumerable skills, where, ideas spring, feelings flow, motor creates, spirit reins, and the self resonates with the sphere in this digital age? Dancing crops, flowing wisdom, enchanting music, touching songs, resonating dance, immersing verses, speaking sculptures, enlightened learners, innovative researchers, skillful scholars and creative constructors are the wonderful springs of nature.

India ought to have skill, scale & speed to realize sustainable development. We need to be proficient on hard skills & soft skills, Science Process Skills & Digital Age Skills, Research Skills & Constructivist Skills, Laboratory Skills & Connectionist Skills, Self Direction Skills & Social Development Skills, Digital Age Skills & Spiritual Development Skills, Cognitive Skills & Emotional Development Skills, Micro-Specialist Skills & Wholistic Development Skills, Time-Space-Personnel Management Skills & Spiritual Development Skills, Production Skills and Marketing Skills, Human Development Skills & Universal Becoming Skills, Production-cum- Consumption Skills, Downloading Skills & Uploading Skills, becoming skills & debecoming skills, and above all Skills for living and leading full meaningful, happy & healthy life. There is an immediate need to evolve & integrate Taxonomy of Educational Skills in Teacher Education.

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Helaiya Sheetal & Goel D.R. (2011), Life Skills Programme for Student Teachers: A Research Work, VDM Verlag Dr. Muller, Germany.

Vaidehi P. Gupta(2013), Role of ICT for Wholistic Development of the Student Teachers, Unpublished M.Ed. Dissertation, CASE, The M.S. University of Baroda, India

Teacher Education in India: Issues & Concerns

Chhaya Goel & Devraj Goel

ABSTRACT

The intent of the present paper is to enhance the Teacher Education Quality in India by focusing on the Emerging Issues & related Concerns. Quality is created and nurtured by the human beings. No institution can remain healthy and survive unless its people work honestly, diligently, and continuously. Quality is a construct of vision tuned mission which demands commitment. Quality is a way of life. It needs inner driving force. Quality demands a quality culture which depends upon meticulous organization, healthy environment, visionary leadership and efficient management. Quality is all pervasive. The spirit of quality can be best inculcated and nurtured by observing it in every bit of act. Quality is in our minds. It springs naturally, beautifully, and blissfully through sensitivity & concern. There can be no quality without substance. There can be no identity without entity. Teacher Education needs to realize its identity.

Various issues of Teacher Education have been dwelt on in this paper, namely, institutional inertia, brand inequity, quality crisis, overgrowing establishment, rare humane and professional teachers, poor integration of skills, alienated and incompatible modes of teacher education, little contribution to higher education, weak & meek philosophical and historical foundations, domain pedagogy mismatches, identity crisis, rare innovations, stake holders' non-alignment, inadequate technology infusion, little choice base, poor research scenario, vision and vision mismatches, non-scientific manpower planning, illusive laboratories, over activism of distance/open universities, invalid recognition and accreditation, no teacher education policy, and fault finding tendency with teacher education. Also, the due concerns have been presented, such as, need of teacher education policy in India, renewal of regulations & norms, valid estimation of the requirement of the Teacher Education Institutions, realizing research rigor, innovating teacher education, designing & developing competency based wholistic teacher education, up-gradation of Teacher Education Laboratories and Libraries, revival and enhancement of Teacher Education Identity, and governance of teacher education by the teacher education experts. The paper concludes that the Teacher Education in India calls for revolutionary changes.

Teacher Education in India: Issues & Concerns

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Indian Teacher Education has been strengthened a lot during the past couple of years. The NCTE Regulation 2007 were revisited and modified by the NCTE and notified in 2009. The Elementary School Teachers' qualifications were worked out and notified in August 2010. The TET inclusion in qualifications has been widely appreciated, wherein, it was provided that even after obtaining the necessary qualifications the teacher will have to obtain at least 60% marks in TET. Norms and Standards for Two Year Diploma in Performing and non-performing Art Education were worked out by the Council and notified in August 2009. Teacher Education New Curriculum Framework was designed and released during March 2010. The Study of Demand & supply of trained teachers in States and Union Territories at primary, upper primary, and secondary levels was completed by the Council in 2010 and was published in 30 volumes. The recognition of sizable number of below standard Teacher Education institutions was withdrawn. A large number of Teacher Education institutions have shifted to their own premises. Bridge courses have been introduced to strengthen Teacher Education, where found wanting. Online applications and self disclosure drives were introduced. Persons of integrity and competence were included in the Visiting Team Panels. A manual has been designed on the structure & functioning of the labs. A volume has been published by the NCTE (2009), namely, Teacher Education, which contains Reflections towards Policy Formulation.

The efforts made by the NCTE are indeed appreciable. The Teacher Education has been struggling to strengthen its identity. Struggle does not mean degeneration of values and degeneration of institutions. It is true that after persistent struggle there is evident improvement, but, still there is no end to perfection. Every establishment has noise. There are issues and resolves, problems and solutions, puzzles and pathways.

Find below reflections on some of the issues concerning Teacher Education in India.

Institutional Inertia

Due to divergence of State, Society, Judiciary and Education there is institutional inertia. Who is accountable? The State? The Society? The Judiciary? The Education? or all of them? Incubation, innovation, creation and construction are the products of Peace, patience and perseverance. Annihilation, deletion and destruction can be done within seconds. Education has its own identity. No body should try to superimpose and dictate

education. Earlier the Society was governing the Society, then the State started governing the Society, now the Economy is overarching, both the State & Society. The private & corporate sector has more of commercial motive. Education has been largely commercialized. Return on investment is being estimated in terms of material profit rather than in terms of all round development.

Brand Inequity

There is Public Private Dichotomy in Teacher Education. There is a pathetic indifference in Public Sector institutions and rampant commercialization in Private Sector. The Teacher Education Degrees conferred by the various universities and institutions are non-comparable. Are TETs, SETs and NETs the solutions. If the input and process norms are grossly wanting, then how can the quality be ensured. What could be greater loss than Educational institutions questioning the legitimacy of their own products?

There is evident variation at all levels input, process and output. The study conducted by Madhavi R.L. (2009) reveals that Research Aptitude, Educational Management Aptitude, Adjustment Capacity and Teacher Education Disciplinary Profile have been found to be significant predictors of Teacher Education Proficiency in the Western Region of India. Research Aptitude, Adjustment Capacity and Teacher Education Disciplinary Profile have been found to be predicting positively significantly, whereas, Educational Management Aptitude negatively. Living competencies and Techno-Pedagogic Competencies have not been found to be significant predictors. There is a need to find out how the Teacher Education has failed to correlate significantly with these variables. Also, there is a need to find out how the Educational Management Aptitude has been found contributing inversely. None of the six variables has been found to be significant predictor of Teacher Education Proficiency in the Northern, Eastern and the Southern regions of India.

Enrollment in Teacher Education Programs varies from region to region. There are some areas in India where the enrollment in Teacher Education is near full, but, the physical presence in the Face to Face mode is near nil. These are exclusively commercial centers than Educational. There should be immediate ban on these institutions, whether, these institutions are under the purview of the NCTE or not. There are well specified Teacher Education Curricula by the NCTE. Even then in significant number of institutions there is under coverage.

The quality of product and placement criteria for Teacher Education program vary from university to university. There is evident disregard with respect to the NCTE Norms and Regulations. The question is whether to revise the norms or the parameters or both.

Quality Crisis

There are problems of quality perception, quality scaling and quality differentiation in Teacher Education. There is a significant variance between expected and actual quality. Alas, this gap is widening. This is exemplified by the successive entrance tests for higher level, be it Graduate, Post-Graduate or Doctoral Level. There has to be adequate focus on all the systemic parameters- input, process and output.

The degeneration of quality of Teacher Education can be attributed more to the Private Sector. Unless the Teacher Education norms are observed sincerely by the society, no body can help.

Overgrowing Establishment

Establishment has overgrown enrollment in most of the Teacher Education Programs. But, at the same time there is uneven distribution of the Teacher Education Institutions. Teacher Education Regulations, Norms and Standards though latest visited during 2009, have further scope for perfection. There is a need to have demand and supply estimates. Blanket “NO” and even Blanket “YES” can be grossly harmful in the Public Interest. The States need to justify, substantially, case-wise their stand for objection or no objection with due respect to the establishment of Teacher Education institutions.

There is a need to find out teacher education institutions required countrywide, Program-wise and State-wise, at present, and in future. Surveys need to be conducted to find out the present status and requirement. These projections ought to be in tune with the growth of School Education. Also, futurological studies need to be conducted to make forecasts of Teacher Education.

Rare Humane & Professional Teachers

Teacher Education for preparing humane & professional teachers needs to be wholistic. Along with content & methodology there is a need to integrate emotional competencies, such as, self-awareness and self-management, social sensitivity and social management. There is a need to integrate life skills, such as, self-awareness, empathy, interpersonal relationship, effective communication, critical thinking, creative thinking, decision making, problem solving, and coping up with emotions and stress. There is a need to integrate info-savvy skills, such as, asking, accessing, analyzing, applying and assessing. There is a need to integrate techno-pedagogic skills, such as, media-message compatibility, media designing, integration of message media and modes, realizing proximity of message forms, media language proficiency, media choice, message authenticity and media credibility, media automation, media integration and media acculturation. There is a need to integrate human development climate through trust, risk taking, openness, reward, responsibilities, top support, feedback, team spirit and collaboration. There is a need to integrate spiritual intelligence dimensions, such as, spirituality, soul or inner being, self awareness, quest for life values, convention, commitment and character, happiness and distress, brotherhood, equality of caste, creed,

colour and gender, inter-personal relations, acceptance and empathy, love and compassion, flexibility, leadership, life & death. The Teacher Education programs need to integrate innumerable skills & competencies.

Environmental Education courses run by Teacher Education institutions have been found to enhance environmental awareness, but, not developed environmental ethics. Political Science Education Programs have been found to multiply the number of professional politicians and not humanistic statesmen. Law Education is not ensuring lawfulness. Even after Science Education the actions are not scientific. The convocations without invocation are useless and painful.

Merit is destroyed due to mismatches between Teacher Educators and Teacher Trainees. Quality teachers can be developed through skilled and competent Teacher Education professionals who have passion for profession. There should be no compromise with the standards and norms.

Poor Integration of Skills

The term Skill has become a misnomer, particularly, in Education. All the skills, such as, Life Skills, Techno-pedagogic skills, Techno-Savvy skills, Info-Savvy skills, Emotional Skills, Human Development skills, Spiritual Skills need to be integrated in Teacher Education. The study conducted by Helaiya S. (2009) very well presents how the Life Skills can be developed in the Pre-Service Teachers and integrated in the Teacher Education Programs. The study insists that all the life skills need to be integrated in the Teacher Education Programs. There should be simultaneously focus on creative thinking and critical thinking, as well as, self - management and social management. The present century teachers ought to be highly skilled in management of stress and emotions. The study conducted by Madhavi R.L. (2009) has tried to scale the Techno Pedagogic Skills amongst the M.Ed. students. The study reveals that Living competencies and Techno-Pedagogic competencies have not been found to be the significant predictors of Teacher Education Proficiency in India.

The Study by Dhodi N. (2011) on the development of info-savvy skills in Secondary Student-Teachers demonstrates very well how the info-savvy skills of Asking, Accessing, Analyzing, Applying and Assessing were developed in the Pre-Service Teachers of India through surfing on Cultural Heritage of India, Buddhist Heritage of India and on the domains of their respective discipline methods. It is a joyful experience to travel through her research volume experiencing various surfing skills, viz., skimming, scanning, authenticating, hyper-linking, switching, skipping culminating into educational immersion for seeking solutions.

The intervention program by Dutta A. (2009) was an attempt to provide student-teachers with varied exposure and experience which helped them to enhance various emotional skills and so emotional maturity.

Rao G. Kamesh (2009) conducted a study on the Human Resource Development Climate in the DIETs of Rajasthan, India. The HRD Climate in the DIETs of Rajasthan was found to present a mixed scenario. The HRD climate of Bikaner Zone was found to be most healthy, whereas, that of Ajmer zone the least healthy. The HRD climate of the DIETs has been found to be healthy with respect to Responsibilities, Top Support, Team Spirit and Collaboration. Next in the series are Risk Taking Behaviour, Openness versus Communication and Reward. The Supportive HRD Climate and Trust have not been found to be that conducive.

The various skills need to be properly integrated in Teacher Education. Teacher Education is starving and striving for competent & proficient teacher educators.

Alienated & Incompatible Modes of Education

There is little parity amongst various modes of education, such as, distance mode, e-mode, and face to face mode. Distance mode is diluted, e-mode is in infancy, whereas, the face to face mode is stagnant. There is no network amongst the various modes of Teacher Education. These are functioning more or less in isolation.

Little contribution to Higher Education

Teacher Education has not been in a position to come out of School Education. It has made very little contribution to Higher Education. Educationists have been over obsessed with the School Education intensively for complexity, enormity, and the large number of the schools and students, but this is at the cost of neglecting higher education.

Week & Meek Philosophical & Historical Foundations

A number of studies were conducted during the recent past, on Educational Implications of the Sikh Guru Bani (Jasbir Kaur, 1998, Guru Nanak Dev University, Amritsar; Guralp Singh, 1999, Punjabi University, Patiala), Bhagvad Geeta(Subhash Chandra Panda, 2004, Berhampur University, Berhampur; Sunita Singh, 2006, Dr. Ram Manohar Lohiya, University, Faizabad), Gram Geeta, (Shobhna Purushottam Saoji, 2006, Sant Gadge Baba Amravati Vidyapeeth, Amravati), and Hermann Hesse's Philosophy (Alka Mecwan, 2008, S.P. University, Vallabh Vidyanagar) and other Philosophers.

Doctoral studies have been conducted in India on Sankhay Philosophy, Life and Work of Dr. Babasaheb Ambedkar, Sakhi of Saint Kabir, Educational Ideas of Pandit Deen Dayal Upadhyaya and Madan Mohan Malviya, Philosophy of Mahatama Gandhi, Dev Atma, Gurudev Tagore, Teachings of Bhisma in Mahabhartta, Gautam Buddha, Shri Panduranga Shashtri, Upanishad, OSHO of Rajnish, Sir Sayed Ahmed Khan, Yoga Vashishtha, Dr. S. Radhakrishnan, Shri Pandurang Athavle, Swami Vivekanand and Shri Aurobindo Ghosh, Ramakrishna Mission, Vinobabhave, Mahatama Jyotirao Phule, Chatrapati Sahu

Maharaj of Kolhapur, Motibhai Amin, Maganbhai P. Desai, Guru Nanakdev Ji and Martin and Vedantic Model of Swami Rama Tirtha.

Guru Arjun Dev advocated Guru as the pivot who can lead his disciples on the path of reality. His educational thoughts are deeply rooted in Indian Tradition to acquire self realization and self manifestation. Truth, love, beauty and bliss are the four doors of the building of spiritual education. He advocated absolute purity, absolute love, absolute honesty and absolute unselfishness as the four pillars of the building of international understanding. Guruji advocated that evaluation is not the monopoly of the teacher alone. The children evaluate their work themselves.

Basically the Sikh Gurus were idealists and their philosophy comes under the terminology of idealism. But their understanding of the problems and their solutions were realistic and practical. They always worked out solutions in the context of their social, cultural, ethical, moral, political and economic nature. Sikhism is basically a relationship of Guru (Teacher) and Sikh (Shish). Thus their philosophy of life has great relevance with respect to philosophy of education. The concepts put forth by Sikh Gurus with special reference to aims of education, curriculum, pedagogy, teacher, pupil, discipline, and teacher-pupil relationship are not merely theories but involve practical wisdom. The axiology of Sikh Gurus emphasizes on value oriented education, which is the main construct of individual's character. The trio of their value system is 'Nam Japna', 'Vand Chakna' and Kirt Karni'. The metaphysics of Sikh Gurus involves the root of reality. What is true is real and what is real is true. They suggest a honest life with complete faith in Him. Sikh Gurus being great moral and spiritual teachers emphasized the cultivation of intellectual, aesthetic, moral and spiritual values in life. In the views of Sikh Gurus, it is essential that there should be overall development of man from mental, intellectual, moral and spiritual horizon.

For a self realized soul, the entire cosmos is a manifestation of God. There is nothing more purifying on earth than knowledge. The mundane man should go through Bhagvata Gita to liberate the self from Maya. Humanism is one of the important virtues of divine life. The platonic love is real love between soul to soul. Various educational and philosophical implications of Bhagvadgita are- The status of Guru is more than that of God. A teacher with sound personality and super character is the only ideal. The teacher is a Jyot and Jyotsana which enlightens the little ones. Guru Vedvyas provided divine power of seight to Sanjay. It flags a message that a teacher should provide insight to his pupils to awaken their conscience , so that, they are in a position to discriminate between Sin and Punya, Good and Evil. Every teacher should be a Friend, Philosopher and Guide for his learners as Gita depicts through the association of Lord Krishna and Arjuna. The objectives of Education and Learning environment need to be designed in the light of Prigrah and Nigrah. Lord Krishna led the war not for the realization of his selfish objectives, but, for public welfare. The Shiksha of Gita is not for Arjuna only, but for, all times and all generations. Gita gives a shiksha of control of senses also. One can liberate oneself of Maya or illusion. Strong determination and faith are the keys to success. Karma with Bhagti has wonderful returns.

Scientific Attitude, Gender Equity, National Integrity, Respect for all religions, Cleanliness, Humbleness, Sensitivity, Punctuality, Dignity of Labour, Patriotism are some of the values identified and confirmed from preaching of Gram Geetha. The text of the National Saint Tukdoji Maharaj in the form of Gramgeeta is its own testimony, for example, “ Aggyananech Duravtey Pragati”, “Dhan He Gribanche Rakt”, “Shram Hi Gavachi Daulat”, “ Desh Dukhi Jnu Mazhechi Shareer”. Hermann Hesse’s Philosophy focuses on be, becoming, being and then de-becoming.

The eclectic philosophy of all the Philosophers should be the foundation of Education. How Philosophical foundations can be strengthened? We observed 11th of November as “National Education Day” for celebrating the Birth Anniversary of Maulana Abul Kalam Azad. Let all of us ask a basic question to our own self that to what extent we have been in a position to emancipate/Azad ourselves from caste, creed, religion, region, relation in this secular State of India. To what extent we have been in a position to have democratic socialistic dialogues? To what extent we have been in a position to integrate naturalism of Gurudev Rabindranath Tagore to realize the liberty of learner? Where does the Viveka of Swami Vivekanada flow through our Education? Where is the Statesman, and Educational Philosopher of the class of Dr. S. Radhakrishnan to enlighten us? Let us Search & Re-Search.

No Philosophy is of eternal value because each idea is propounded within the limitation of time and space. Since the interplay of space, time and matter changes, it calls for development of new set of theories, which should be identified by examining the fusion of old with the new or discerning a new direction which defies the known patterns. In either the case, a new theory is called for to provide guidance to the new developments. Old theories and old philosophies, particularly, in Social Sciences are going obsolete. There is a need to build problem specific instantaneous theory.

From “Escola Normal” during the Portuguese Goa (1841-1961) to the proposal for e-Teacher Education (2008), India is a witness to variety of Teacher Education. The credibility of classical Teacher Education is fully established. The land area, location, institutional plant, environment, objectives, curricula, learning resources, modes of transaction, evaluation modes and mechanisms, placement, renewal are talked of even today. But, there are question marks on the Present Day Teacher Education. Distance education has done the alarming harm to Teacher Education, being most deployed & diluted and least professional. Commercialization is a big threat to most of the traditional Teacher Education Colleges. None of the innovations in Teacher Education, such as, Longer period Teacher Education, Integrated Teacher Education, Personalized Teacher Education, Specialized Teacher Education could be institutionalized further. Either these have faded or are limited to the places wherefrom these originated.

There are rare Research Studies on the Historical foundations of Teacher Education.

The benefits of decentralization and autonomy were well demonstrated by Escola Normal (Richard Cabral, 2007, Pune University, Pune). A study has been reported on the origin and development of Ancient India Universities (Amar Singh, 2008, Dr. R.M.L. Avadh University). The ancient Indian Universities, namely, Takshshila, Nalanda, Vikramshila, Vallabhi, Odantpuri, Jagdalpur, Kashi, Kashmir, Mithila, Nadia, Dhara, and Kannauj

have a lot to offer regarding the Profiles of Acharyas, attributes and dedication of Learners, Curricula, Modes of Transaction, Examination and Evaluation. The Autonomy of Education and Decentralization of Management were remarkable. The expertise and character of each Acharya was a focus of attention for students from far and wide. The profiles of the Dwar-Pandits and Top Administrators of the Universities are still on Records. Each Ancient Indian University was unique in specialization. It was a Honour to be the Scholars of these universities. Each word spoken by the scholars was establishing the testimony of the text. Let us excavate the History. Even the remains have a lot to offer to the present Teacher Education.

Studies have been reported in the Progress of Primary Education in Amritsar District after NPE 1986, and Aligarh District post-independence, development of post-basic education in Gujarat, development of Higher Education in Manipur and UP post-independence, History of Pre-Service Training of Secondary Teachers in Maharashtra State, and In-service Teacher Education in Punjab from 1947-1990, History & Development of Nair Service Society as a voluntary Educational Agency in Kerala, and Educational Thoughts of Maharaja Chatur Singh of Mewar (1880-1929).

The Philosophers appear but their philosophies find rare expression in our Education. Element less Elementary Education, Directionless Secondary Education and Irrational Higher Education will lead us no where. Mechanistic Academic Performance Indicators (APIs) are the latest jock of Education.

Domain Pedagogy Mismatches

There are mismatches between the subject and pedagogy. There are mismatches amongst the profiles of the learners and their education. Every subject has its own structure and functions. Each subject has its own ethos and discipline. Every Education level has its own tenderness. In spite of the presence of all the global and regional attempts we have not been in a position to even sustain the identity of Elementary Education. When is the Education said to be universalized? Every moment there are slogans and predicaments to universalize education. Has the Education really been universalized? Has the Right to Education ensured Education? Have we really been strong enough to provide differentiated differential inputs? Subject specific differential pedagogy demands scientific bases. We ought to make sincere & exhaustive attempts to realize the matches.

Identity Crisis

Every teacher Education institution ought to have valid identity. Valid identity means valid institutional land & plant, valid setting, valid inputs, valid processes and valid products. Each & every Teacher & Teacher Educator ought to have a Unique Identification Number. The Self-Disclosure exercise being done by the Teacher Education Institutions helps in realizing identity. The National Curriculum Framework for Teacher Education: Towards Preparing Professional and Humane Teacher (Dec. 2009) is with high hopes. Also, Teacher Education: Reflections Towards Policy Formulation (2009) is quite promising. Teacher Education will have to revive and build its identity.

Rare Innovations

Where the ideas spring, feelings flow, motor creates, nature blooms, self with environ resonates, the spirit reins, there, we innovate, construct and create. The soul of a gardener resides in the seeds, the soul of philosopher resides in the mind, the soul of piper resides in the pipe, the soul of a singer resides in the voice, the soul of a dancer resides in each & every body cell, the soul of a poet wanders in the nature, the soul of a sculpturist resides in the stone, the soul of a teacher wanders with the learners. Dancing crops, flowing wisdom, enchanting music, touching songs, resonating dance, immersing verses, speaking sculptures, and enlightened learners are the wonderful springs of nature. Teacher Education is a discipline which educates the progressive generations on what has gone by, where we are, where we want to go, and what we like to create, observing healthy, meaningful and long life.

Innovations in Teacher Education are very rare. It may be attributed to various factors. Novel ideas do not incubate because of the adverse external conditions. There are wide gaps between the visionaries and actors. So, very often the innovations have short life and die down in the institutions, where these originate. Sometimes, the most innovative programs fail in the formal system, because, these are beyond the view & purview of the apex bodies. Four year Integrated Secondary Teacher Education Programs need excellent Teacher Educators who are Philosophers of basic Disciplines, as well as, Education. Such a combination is rarely found. In addition to this, these need to have scope for vertical mobility. Activity based, Personalized Teacher Education Programs though originated with zeal, yet need to struggle to sustain themselves in the forms envisaged.

Novel ideas die because of non-incubation. Personalized Teacher Education, Wholistic Teacher Education, Specialized Teacher Education, and even Integrated Teacher Education are rarely found because we don't have the capacity to tolerate repeated failures arising out of experimentation. One shot success is a fairy tale and not the reality of life. The society and its institutions must have the capacity to tolerate genuine mistakes committed inadvertently during the course of innovation.

Stake Holders Non-alignment

Different parties to education champion their cause by becoming the so called stake holders without having regard to the needs, urges and aspirations of other stake holders. Consequently, the system is unduly stressed, instead of making it resilient enough to deliver man making education. State indifference and displeasure, Judicial concern and activism, Privatization and commercialization, Public hope and failure, disregard and disrespect for Education are fully evident.

Inadequate Technology Infusion

Teacher Education Programs are largely traditional. Pace of modernization is very slow. We have not yet been in a position to infuse the technological innovations for transacting the education. There is more of knowledge deepening than knowledge construction. We have rare patents in Educational Technology.

A sizable number of studies on effectiveness of CAI developed through various computer languages employing either pre-experimental design or quasi experimental design reveal significant mean score gain from pre-test to post-test. Studies on the effectiveness of CAI reveal favorable reactions of students and teachers towards the CAI. (Prabhakar 1989; Himani 1990, Mahapatra 1991, and Adhikari 1992, DAVV, Indore; Khiwadkar 1999, Zyoud 1999, Yadav 2000, Goel Khirwadkar Tomar Das & Joshi, 2000, Macwana 2004, Sharma 2005, Barot 2005, Pradesi 2005, and Rathod 2005, MSU; Suwanna 2004, SGU; Upadhyaya 1999, MJP Rohilkhand University, Bareilly; Sanjana 2001, MDU and Pandian 2004, DU)

There have been found rare studies on the pedagogic/techno-pedagogic analysis of the computer based educational instructional programs. These studies reveal that there should be added focus on production variables, pedagogic principles and spatial and temporal contiguity of various message forms (Patel, 2001,MSU; Chaudhari,2005, MSU).

Computer as a medium has been found to have the potency of addressing the heterogeneity in terms of variables, namely, IQ, Interest, Motivation, Language level (Zyoud, 1999, MSU).

There are rare studies on effectiveness of CALM in various modes, namely, text, graphics, text & graphics, text, graphics & music. It has been found that the composite modes may not always ensure higher level of language learning (Das, 1998, MSU).

Very few studies have been conducted on the relative effectiveness of CAI with peer interaction in mono, diad and triad (Pardesi,2005, MSU).

Attempts have been made for designing, developing and implementing computer based Learning Resources Management System (LRMS). The automated LRMS has been found definitely more effective than the the manual LRMS (Beryah, 1995, DAVV).

A few studies have been conducted on the relative predictivity of various variables with respect to the criterion variable, namely, Educational Proficiency (Mishra, 1993, DAVV; Goel,2003, MSU).

A study conducted on Time Space Personnel Management System revealed that the computer based TSPM system was found relatively more acceptable and better functional than the manual TSPMS (Biswal, 1995, DAVV).

Though studies have been conducted on the automation of examination system, yet these studies find rare expression at the functional level. Teacher Education Institutions need to promote Choice Based Credit System and on demand examination (Mahajan, 1993, DAVV; Joseph, 1993, DAVV; Shinde, 1993, DAVV; Goel, 1997, MSU).

A sizeable number of teacher education institutions in India have initiated into ICT in Education either as a core course or as optional course. In spite of the impeding factors, namely, limited staff, inadequate laboratories with maintenance problems, sizeable

classes, the courses have been found to realize their objectives reasonably (Goel, Das, and Shelat, 2003, MSU). A sizeable number of teacher education institutions have been found lacking facilities, such as, Internet, MS Publisher, Acrobat Reader Goel, 2005, MSU). A few studies conducted on the use of Internet in Teacher Education Institutions revealed that the student teachers largely lack in info-savvy skills and techno-pedagogic skills (Joshi, 1999, MSU; Dhodi, 2005, MSU) . Some of the teacher trainees make use of Internet for surfing, e-mail, research, core courses, special areas. But, the Internet is rarely used for web designing, reflective dialogue and outsourcing. Measures of Internet safety are rarely employed. There is a need to develop Net-Savvy Skills in Teacher Educator Trainees(Goel, 2006, MSU). Some Studies have been conducted on bridging the gaps between teaching styles and learning styles. The studies are appreciable but there is a need to conduct many more studies Rathod, 2005, MSU). Studies conducted on language instruction through Power Point Presentations on realizing communicative and functional languages have been found to go a great way in establishing the effectiveness of learning various languages (Yadav, 2005, MSU; Rathod, 2005,MSU). There have been rare studies on developing language learning strategies and learner autonomy through weblogs. Blogs not only provide teachers with an exciting new way to approach communicative language learning, these also give students a new reason to enjoy reading and writing. Educational Technology and ICT in Education have demonstrated their values. But, Technology in Education is not yet fully integrated. Technology in Education is still under utilized. There is Technological revolution in Teacher Education. There is a shift from Bachelor of Teaching to Bachelor of Learning, that too, Bachelor of e-Learning. There is a shift from e-Learning 1.0 (Online learning) to e-Learning 2.0 (Twitters, Face-book) to e-Learning 3.0 (Semantic Web) , that is, from content to community to Artificial Intelligence. There is a quick shift from web-1 to web-2 to web-3. We have initiated into Open Education, Open Course Ware, Open Source Software, Open Content and Open Research. There are proposals for e-Teacher Education. Smart Classrooms are emerging, wherein, we have e-learning and e-testing. Terms like Wi-Fi, iPad, e-Book, e-Reader, e-News Letter, Webinar are widely used. Digital Lesson Designs and e-Portfolios have become common features. There are compendiums of e-abstracts and Surveys of Educational Research in India on the World Wide Web. The NCTE is expediting Teacher Education on e-Technologies through an MOU with the Intel. There is wide scope for transformation of Teacher Education through Technology.

Little Choice Base

Options are not substitutes for Choice Based Education. Choice by whom- Students, Teachers, or by both? The issues involved relate to the systemic correction, as well as, developing the right attitudes to make it a success. Though we have introduced optional areas in Teacher Education, but the choice is very limited. There is a need to employ CBCS in Teacher Education, which can be realized through e-platforms, and amalgamation of various modes, such as, F2F, Distance and Electronic. Choice base demands plenty of resources.

Poor Research Scenario

Research in Education is replicate and repetitive devoid of freshness, either of problem or of approach or of methodology. The national agenda for Research needs to be developed in alignment with the developmental objectives. A prospective plan for research and innovations should be framed with regional and national developmental priorities. The Research Methodology must be compatible with the local problems. There is a need to be innovative. There are mismatches between research trends and problems. Regulatory mechanism to tone up the Research Quality needs to be evolved. There is a need to evolve Research Quality indicators. There is a need to evolve social sciences compatible indigenous Research Methodology. Philosophical & Historical Studies are very rare. There is more of Quantitative Research than Qualitative. There is more of descriptive and evaluative research than suggestive. There is more of borrowed methodology than indigenous. Taxonomy of Research needs to be evolved.

There are more of quantitative studies than qualitative. The studies are scattered and unlinked. There is lack of continuity, cumulativeness and synthesis. Most of the studies are descriptive rather than preventive and ameliorative. Culture for incubation of ideas is grossly lacking, what to talk of inculcation. Statistics and Psychometrics are superimposing reality. There is a mixed scenario of Research in Education. Some of the observations are as follows:

- A large number of surveys have been conducted in Education. But, the principles of objectivity, transparency, equivalence and generality have not been adequately observed.
- In experimental research, largely the scholars move from induction to abduction to thesis to analogy to facts to theories. But inconsistent scattered researches lead us nowhere. Social laboratory is a myth and figment of imagination. It has become essential to sustain social life that the social scientists evolve their own methods.
- In case study research diagnosis of a case is as important as prognosis of its disposition. A large majority of us have become excellent in describing the problems and cases, but prognosis is lacking. Here the presage, process and product variables, all, need to be treated very carefully.
- Naturalistic enquiry which phenomenology demands needs to be conducted in an open, naturalistic, parametric setting. Because more and more are the controls in a social science laboratory, lesser and lesser is the generalization.
- Qualitative research cannot be conducted through a-priori samples only. Sampling goes on throughout research, through various sampling techniques, such as, typical case sampling, intensity sampling, critical case sampling, sensitive case sampling, convenience sampling, primary selection and secondary selection. Qualitative Research cannot be conducted through static tools and techniques, because very often the researcher employing qualitative research methodology does not have a sound theoretical base related to the reality. Theory in fact is the product of enquiry. Qualitative Research is affected by a wonderful interaction of

subject and object. The object needs to be perceived as objectively and comprehensively as feasible.

- One of the basic tenets of qualitative research is awareness of one's own biases. There is a need to address diversity issues, such as, gender, race, religion, ability, sexual orientation, and socio-economic status. The pursuit of knowledge should be conducted with sincerity and care.
- Critical theory takes as a central concern the issue of power in the knowledge context. It focuses on how and in whose interest knowledge is produced and passed on. Where are the funds floated? What is the interest? What is the return on investment?

Vision & Mission Mismatches

University of Teacher Education has come up at Chennai. IITE is being established in Gujarat Many integrated Teacher Education Programs are proposed. Private Teacher Education Universities are also coming up. But, there are evident mismatches amongst Vision, Establishment, and Mission.

Non-Scientific Manpower Planning

The 21st Century is highly complex. The return on investment, be it public sector or corporate is measured in terms of material returns than in terms of human development. Human beings are most neglected. There is more of focus on GNP than on HDI. In this ICT and digital age machines are most respected, whereas, men are most neglected. What to talk of the knowledge poor, even in the knowledge rich societies, gross injustice is rampant. Environmental Awareness does not ensure Environmental ethics. Law graduation does not ensure lawfulness. Political Scientists may become Professional Politicians, but not necessarily Humanistic Practical Politicians and Statesmen.

There are demand and supply imbalances in Teacher Education. Appreciable attempts have been made for manpower planning. But, the manpower planning still needs to be done more scientifically. It is expected of the various States that these play active role in manpower planning.

Illusive Laboratories

The various laboratories of the Teacher Education institutions, namely, Science Lab, Psychology Lab, Guidance & Counseling Lab, Educational Technology Lab, Computer Lab, and Language Lab are either not there or are mostly in very bad states. The field reality is still verse. All the laboratories ought to be fully functional and innovative to address the field problems.

Over Activism of Distance/Open Universities

Some of the distance and open universities have become over activists in the context of Teacher Education. These have a notion that they can open their Teacher Education Extension Centers anywhere. To give birth to infinite is their Right. But, who will rear their babies. Such distance and open universities have resulted into the dilution of Teacher Education.

Invalid Recognition & Accreditation

There are questions on Recognition of Teacher Education institutions. There are questions on inputs & processes of Teacher Education. There are questions even on Accreditation of Teacher Education institutions. Escola Normal of Goa was much better established during Portuguese Period than the most recent Modern Teacher Education institutions in India. Nalanda was having a much better profile and grade than the Highest Graded Modern Universities.

No Teacher Education Policy

There is no Teacher Education Policy in India. But, who will formulate Teacher Education Policy? To preserve the identity and sanctity of Education, it is high time that we introduce Indian Educational Services. It is unfortunate that the Education is not even considered as an entity.

Irrespective of geographical and cultural context, education is needed for all and therefore, it should be a national priority instead of leaving the subject in the domain of States. For this education should be shifted to the central list of the constitution from the concurrent list. In order to make it locally relevant, the financial and administrative arrangement be jointly shared, both, by the Centre and States. This would hopefully loose the chains of political interference in the University system.

Fault finding Tendency with Teacher Education

Every fault of Teacher Education is attributed to the National Council of Teacher Education. Rather than finding faults let us try to meet the gaps between our Policies and Programs, Vision and Mission, Wish and Will.

CONCERNS

- 1 There is no Teacher Education Policy in India. The chaos present in Teacher Education in India demands well formulated Teacher Education Policy.
- 2 Regulations & Norms of Teacher Education in India are more Idealistic than Realistic. These need to be realistic.

- 3 Surveys need to be conducted to estimate the teacher education institutions required, countrywide, State-wise and Program-wise. Every State should be asked by the NCTE to conduct surveys and submit the estimates within stipulated time.
- 4 There should be added focus of Research on Historical, Economic and Philosophical Foundations of Education. There is a need to develop Human Resource in all these relatively neglected areas.
- 5 The effectiveness of Research in Educational Technology and ICT is reasonably established. But, the researches have failed to feed back the system. There should be Research on Info-Savvy Skills and Techno-Pedagogic Skills.
- 6 There should be due focus on learner centered activities. Constructivists Approach should be employed both With Information Given and Beyond Information Given. There is a need to move from Behaviorist Model to Communication Model to Interactive Models. Also, there is a need to move from Cognitive Approach to Socio-Cognitive Approach. Rather than going by monolingual models we need to evolve multilingual models. There is a need to develop programs to realize the above objectives. The effectiveness and efficacy of all these programs needs to be studied.
- 7 There should be more of Studies on Human Rights Education, Health & Hygiene, Life Skills Education, and Environmental Education.
- 8 The qualitative research methodology needs to be employed more rigorously. Rather than re-coursing to the old theories there should be added focus on grounded theories. Participatory research with service motive needs to be strengthened.
- 9 There should be due scope for Self Evaluation, Peer Evaluation, Group Evaluation, Teacher Evaluation, School Evaluation and Community Evaluation in Teacher Education Programs. There should be research on the related factors contributing to comprehensive evaluation.
- 10 Teacher Education co-operatively should seek the resources of all sectors- Public & Private. Unless and until all cooperate Teacher Education programs and courses cannot be offered. Courses, such as, Environmental Education, Guidance and Counseling, Health & Yoga Education, ICT in Education definitely demand the services of corporate Sector. The Market Forces should emerge as Educational Forces. There should be research on the relative contribution of these sectors for the realization of the objectives of Teacher Education.
- 11 Teacher Education Institutions cannot afford to function in isolation, both within and among. Inter-disciplinarity and multi-disciplinarity should be practiced by the Teacher Education Institutions. The inter-disciplinary and multi-disciplinary research should be promoted in the Teacher education institutions.
- 12 There should be suitable programs for the renewal of In-Service Teachers and Teacher Educators.
- 13 Innovative Teacher Education Programs, such as, Personalized Teacher Education need to be institutionalized for the realization of Wholistic Teacher Education through flexible time management, variety of modes of learning, Diversified and Participatory Evaluation, Personalized Environment, Learner Freedom, Teacher as Facilitator, Organizer and Inspirer and Field Linkages.

- 14 There should be differentiated, differential integral Teacher Education. There should be suitable inputs corresponding the IQ, Learning Styles, Languages, Interests, Abilities, Cultures, Maturity and other conditions of the learners.
- 15 Teacher education is more content based than competence based. Further there is a wide gap between the Teaching Competencies Expected and Practiced. In addition to knowledge base, the Teacher Education should have adequate focus on inculcation of values, development of desirable attitudes, and enhancement of a variety of Skills- Life Skills, Human Development Skills, Info-Savvy Skills, Digital Skills, Techno-Pedagogic Skills, Emotional Maturity Skills, Spiritual Development Skills, Yogic Skills, and Management Skills.
- 16 The Teacher Education laboratories in a large number of Teacher Education Institutions are not proper. All the Laboratories in Teacher Education institutions should be well equipped and fully functional.
- 17 The Teacher Education in India should be governed by the Experts in Teacher Education. It is Education and Education only which can purify the souls, resonate the hearts, bewitch the minds, and empower the motor-muscles to live with peace & harmony and lead with determinism.
- 18 Teacher Education should revive and enhance its identity.
- 19 There should be adequate convergence amongst the State, Society, Judiciary and Education in resolving any issue.

Concluding Remarks

The foregoing analysis highlights the malaise plaguing the Indian Teacher Education System. It calls for revolutionary changes. There should be open forums and public debates on Teacher Education Policy, rather than leaving it to some selected committees, and commissions.

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Teacher in the Digital Age: Issues & Concerns

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Abstract

The Paper presents genesis of digital age, properties of digital information, Analog & Digital information & their inter-conversion, and Digital Age Skills. Expected profile of Humane & Professional Teacher in the Digital Age is envisaged. Some of the Innovative Programs emerged in India in Teacher Education have been enlisted followed by Emerging Technologies in the Digital Age. Research Scenario in ET & ICT in Education has also been presented. Challenges & Issues for the Teachers of the Digital Age, viz. Shift to more powerful learning paradigms, ICT Illiteracy, Information Explosion & Knowledge Poverty, Technology Alienated Education, Analog to Digital: Fast Conversion, but, Slow Transition, Thin Population of Techno-Savvy, NET Savvy & Info-Savvy, Rare Expression of ICT Aided Constructivist Approaches in Education, Not Fully Functional Open Education Resources, Rising Digital Learning Resources & Diminishing Creative Production, Digital Learning Resources System & Slow Pace, 3Rs to ICT Literacy, Comprehensive Teacher Profile for Inclusive Education in Digital Age, Rare Info-Savvy Teachers, Teacher as a Techno-Pedagogue, Teacher & Participatory Approach of Problem Solving, Technology Integrated Teacher Education, Media for Equitable Education for All, People with Disabilities & Computer Technology, Teacher & Educational Technology, Developmental Challenges & Technological Determinism, Development of Media Culture & Media Intimacy, Black Board & White Board Dichotomy, Technological Evolution & Teacher Renewal, have been delineated. The Paper also shares some concerns, viz. Techno-Friendly Teacher & Teacher-Friendly Technology, Digital Technology Integrated Teacher Education, Courses & Programs on Digital Technology, Professional Development Programs for Teachers & Teacher Educators on Digital Technology, Employing Management Information System Series in All the Educational Institutions, Choice Based Credit System & Sharing of Credits Between Teacher Education & Faculty /College of Technology & Engineering, Specialization of Teachers on Technology for the Disadvantaged Students, Technology Culture in Educational Institutions, MOU Between Technology Agencies & Apex Educational Institutions, Developmental Challenges & Technological Determinism Educational Technology for Equitable Education for All and Teacher as Educational Technologist.

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Digital Age

The Digital Age, also commonly known as the Computer Age or Information Age, is a period in human history characterized by the shift from traditional industry that the industrial revolution brought through industrialization, to an economy based on the manipulation of information, i.e., an information society. The onset of the Information Age is associated with Digital Revolution just as the Industrial Revolution marked the onset of the Industrial Age. During the information age individuals gained the ability to transfer information freely, and to have instant access to information that would have been difficult or impossible to find previously. The Information Age formed by capitalizing on the computer microminiaturization advances, with a transition spanning from the advent of the personal computer in the late 1970s to the internet's reaching a critical mass in the early 1990s, and the adoption of such technology by the public in the two decades after 1990. Bringing about a fast evolution of technology in daily life, as well as of educational life style, the Information Age has allowed rapid global communications and networking to shape modern society.

American engineers began developing digital technology in the mid-twentieth century. Their techniques were based on mathematical concepts suggested by the seventeenth-century German mathematician, Gottfried Wilhelm Leibniz, who proposed a binary computing system. His innovation inspired such numerical codes as American Standard Code for Information Interchange (ASCII) that described objects with digits.

Digital technology is a base two process. Digitized information is recorded in binary code of combinations of the digits 0 and 1, also called bits, which represent words and images. Digital technology enables immense amounts of information to be compressed on small storage

devices that can be easily preserved and transported. Digitization also quickens data transmission speeds. Digital technology has transformed how people communicate, learn, and work.

Telecommunications has relied on digital methods to transmit messages. In the early 1980s, enhanced fiber optics enabled the development of digital communication networks. Digital technology replaced analog signals for many telecommunication forms, particularly cellular telephone and cable systems. Analog-to-digital converters utilized Pulse Code Modulation (PCM) to change analog data into digital signals. Compared to analog transmissions, digitized signals are less distorted and could easily be duplicated.

In 1998, commercial digital television broadcasts premiered in the United States. Communication satellites known as Direct Broadcast Satellite (DBS) transmitted compressed digital signals for viewers to receive several hundred television programming choices. Other forms of digital information, including audio programs, were sent to subscribers via satellite. The Federal Communications Commission ordered all American broadcasts to be digital by 2010.

Digital printing with electro-photographic formatted data technologies have altered how books and magazines are published. The Library of Congress National Digital Library Project has worked to preserve and expand access to rare items.

In the early 2000s, digital computers ranging from laptops to Internet networks came in many sizes and performed various tasks. Supercomputers performed complex mathematical calculations analyzing vast amounts of data. The Digital Data Broadcast System (DDBS) guided air-traffic control. Digital radiography converted analog signals of x-rays to create digital images. Digital information was stored on plastic disks with pitted patterns of 1s and 0s that lasers translated. By the early 2000s, digital cameras had transformed photography by recording color and light intensities with pixels. Also, digital compression of images and video was achieved by Joint Photographic Experts Group (JPEG) and the Moving Picture Experts Group (MPEG) codes. Animation had often been digitized with some films and cartoons being created entirely with computers.

Analogue watches/clocks have a mechanism to indicate time by means of mechanical structures, such as a dial and hands (hand indication type), while digital watches/clocks have a mechanism to indicate time by means of electronic structures, such as a liquid crystal and LED (number display type).

"Digital" ("digit" as a noun), representing a finger, implies a thing that can be counted on fingers, which indicates a number. On the other hand, "analogue" originally means resemblance or similarity, which indicates a continuous quantity, as the antonym of "digital."

Properties of digital information

All digital information possesses common properties that distinguish it from analog communications methods:

- **Synchronization:** Since digital information is conveyed by the sequence in which symbols are ordered, all digital schemes have some method for determining the beginning of a sequence. In written or spoken human languages synchronization is typically provided by pauses (spaces), capitalization, and punctuation. Machine communications typically use special synchronization sequences.
- **Language:** All digital communications require a *language*, which in this context consists of all the information that the sender and receiver of the digital communication must both possess, in advance, in order for the communication to be successful. Languages are generally arbitrary and specify the meaning to be assigned to particular symbol sequences, the allowed range of values, methods to be used for synchronization, etc.
- **Errors:** Disturbances (noise) in analog communications invariably introduce some, generally small deviation or error between the intended and actual communication. Disturbances in a digital communication do not result in errors unless the disturbance is so large as to result in a symbol being misinterpreted as another symbol or disturb the sequence of symbols. It is therefore generally possible to have an entirely error-free digital communication. Further, techniques such as check codes may be used to detect errors and guarantee error-free communications through redundancy or retransmission. Errors in digital communications can take the form of *substitution errors* in which a

symbol is replaced by another symbol, or *insertion/deletion* errors in which an extra incorrect symbol is inserted into or deleted from a digital message. Uncorrected errors in digital communications have unpredictable and generally large impact on the information content of the communication.

- **Copying:** Because of the inevitable presence of noise, making many successive copies of an analog communication is infeasible because each generation increases the noise. Because digital communications are generally error-free, copies of copies can be made indefinitely.
- **Granularity:** When a continuously variable analog value is represented in digital form there is always a decision as to the number of symbols to be assigned to that value. The number of symbols determines the precision or resolution of the resulting datum. The difference between the actual analog value and the digital representation is known as quantization error. Example: the actual temperature is 23.234456544453 degrees but if only two digits (23) are assigned to this parameter in a particular digital representation (e.g. digital thermometer or table in a printed report) the quantizing error is: 0.234456544453. This property of digital communication is known as *granularity*.
- **Compressible:** According to Miller, "Uncompressed digital data is very large, and in its raw form would actually produce a larger signal (therefore be more difficult to transfer) than analog data. However, digital data can be compressed. Compression reduces the amount of bandwidth space needed to send information. Data can be compressed, sent and then decompressed at the site of consumption. This makes it possible to send much more information and result in, for example, digital television signals offering more room on the airwave spectrum for more television channels."

Analog & Digital Information

- In most cases the number of these states is two, and they are represented by two voltage bands: one near a reference value (typically termed as "ground" or zero volts) and a value near the supply voltage, corresponding to the "false" ("0") and "true" ("1") values of the Boolean domain respectively.

- Digital techniques are useful because it is easier to get an electronic device to switch into one of a number of known states than to accurately reproduce a continuous range of values.
- Digital electronic circuits are usually made from large assemblies of logic gates simple electronic representations of Boolean Logic Functions.
- An advantage of digital circuits when compared to analog circuits is that signals represented digitally can be transmitted without degradation due to noise. For example, a continuous audio signal transmitted as a sequence of 1s and 0s, can be reconstructed without error, provided the noise picked up in transmission is not enough to prevent identification of the 1s and 0s. An hour of music can be stored on a compact disc using about 6 billion binary digits.
- In a digital system, a more precise representation of a signal can be obtained by using more binary digits to represent it. While this requires more digital circuits to process the signals, each digit is handled by the same kind of hardware. In an analog system, additional resolution requires fundamental improvements in the linearity and noise characteristics of each step of the signal chain.
- Computer-controlled digital systems can be controlled by software, allowing new functions to be added without changing hardware. Often this can be done outside of the factory by updating the product's software. So, the product's design errors can be corrected after the product is in a customer's hands.

Information storage can be easier in digital systems than in analog ones. The noise-immunity of digital systems permits data to be stored and retrieved without degradation. In an analog system, noise from aging and wear degrade the information stored. In a digital system, as long as the total noise is below a certain level, the information can be recovered perfectly.

Analog Digital Inter-conversion

American Standard Code for Information Interchange (ASCII- 8BIT & 128 Characters), Universal Code (UNI- 16 BIT & 256 Characters) are the standard codes for analog to digital

representation, for English and All Languages, respectively. The data are compressed and communicated in a compatible format, such as, JPEG/GIF & MP3/MP4. The name "JPEG" stands for Joint Photographic Experts Group, the name of the committee that created the JPEG standard and also other still picture coding standards. The JPEG compression algorithm is at its best on photographs and paintings of realistic scenes with smooth variations of tone and color. For web usage, where the amount of data used for an image is important, JPEG is very popular. JPEG/ Exif is also the most common format saved by digital cameras.

On the other hand, JPEG may not be as well suited for line drawings and other textual or iconic graphics, where the sharp contrasts between adjacent pixels can cause noticeable artifacts. Such images may be better saved in a lossless graphics format such as TIFF, GIF, PNG, or a raw image format. The JPEG standard actually includes a lossless coding mode, but that mode is not supported in most products.

As the typical use of JPEG is a lossy compression method, which somewhat reduces the image fidelity, it should not be used in scenarios where the exact reproduction of the data is required (such as some scientific and medical imaging applications and certain technical image processing work).

JPEG is also not well suited to files that will undergo multiple edits, as some image quality will usually be lost each time the image is decompressed and recompressed, particularly if the image is cropped or shifted, or if encoding parameters are changed. To avoid this, an image that is being modified or may be modified in the future can be saved in a lossless format, with a copy exported as JPEG for distribution.

The digital communication very often has High Fidelity, because, there are no losses due to interference and adverse conditions. The data are communicated through point to point connectivity or wireless. Required protocols are observed in communication. We have both analog to digital converters & digital to analog converters. Charge coupled devices are used for digital to analog conversion.

Digital Age Skills

Digital Age Skills have become the basic needs of the present century, such as, Global Awareness Skills- Understanding of how countries, corporations and communities all over the world are interconnected, interrelated and interdependent, Cultural Literacy Skills- Appreciation of diversity of cultures, acculturation, enculturation and trans-creation, ICT Skills- Ability to find, analyze, evaluate and make appropriate use of information, Scientific Literacy Skills- understanding universe through observation, interaction and experimentation and Functional Literacy Skills- Use of Information & Knowledge for living healthy, happy, meaningful and long life.

Humane & Professional Teacher in the Digital Age

Teacher Education for preparing humane & professional teachers in the digital age needs to be wholistic. Along with content & methodology there is a need to integrate emotional competencies, such as, self-awareness and self-management, social sensitivity and social management. There is a need to integrate life skills, such as, self-awareness, empathy, interpersonal relationship, effective communication, critical thinking, creative thinking, decision making, problem solving, and coping up with emotions and stress. There is a need to integrate info-savvy skills, such as, asking, accessing, analyzing, applying and assessing. There is a need to integrate techno-pedagogic skills, such as, media-message compatibility, media designing, integration of message media and modes, realizing proximity of message forms, media language proficiency, media choice, message authenticity and media credibility, media automation, media integration and media acculturation. There is a need to integrate human development climate through trust, risk taking, openness, reward, responsibilities, top support, feedback, team spirit and collaboration. There is a need to integrate spiritual intelligence dimensions, such as, knowledge of God, religiosity, soul or inner being, self awareness, quest for life values, convention, commitment and character, happiness and distress, brotherhood, equality of caste, creed, colour and gender, inter-personal relations, acceptance and empathy, love and compassion, flexibility, leadership, life & death. The Teacher Education programs need to integrate innumerous skills & competencies.

Innovative Programs in Teacher Education in the Digital Age

Teacher Education Institutions at different levels, particularly in higher and technical education field countrywide, have innovated and institutionalized number of Programs, namely,

- M. Tech. Ed., NITTTR, Bhopal and Chennai
- M. Tech. Engineering Education, NITTTR, Chandigarh
- M. Tech. HRD, NITTTR, Chennai
- B.C. Ed. (1989), DAVV, Indore
- M.C.Ed. (1991), DAVV, Indore
- Master of Educational Technology (Computer Applications), SNDT University, Mumbai
- M.Tech. (Educational Technology), Kurekshetra University, Kurekshetra
- B.Sc. in Teaching Technology, Sikkim Manipal University
- Personalized Teacher Education Program, DAVV, Indore (1991)
- Personalized Teacher Education Program, Lucknow University, Lucknow (1996)
- B.Ed. (Educational Technology), AEC Teacher Training College, Pachmadi, MP
- Early Faculty Induction Programme (EFIP) under QIP by AICTE , New Delhi
- Induction Training Programme (ITP) under QIP by AICTE, New Delhi
- IGNOU Institute of Professional Competency Advancement of Teachers (IIPCAT, 2009), IGNOU, India
- Indian Institute of Teacher Education, Gujarat (Bill 4, 2010)

Every Technology Based Innovative program has faced many challenges. Very often such programs are not found to be under the purview of apex regulatory bodies. At times the educational institutions are found not to be risk taking. Very often the top administrators of the universities & institutions fail to appreciate these programs. But if the programs are demonstrating their worth we as teachers should continue.

Emerging Technologies in the Digital age

Following are some of the emerging technologies in the digital age. It is expected of the teachers to be intimate with these technologies.

a. iPad

- Large device with capacitive multi-touch screen of 24.6cm measured diagonally
- Device specification includes a 1GHZ processor with graphics processor
- 16-32-64 GB storage based
- High definition video playback up to 720p
- Opens all video, audio files and documents
- Wi-Fi models available on April 3, 2010
- Wi-Fi + 3G models available in late April
- iPad has a 9.7-inch, LED-backlit IPS display with a remarkably precision
- Multi-Touch screen
- 0.5 inch thin
- Easy to carry & Use anywhere class-room, home, garden

b. Mobile Web 2.0

- Walking around with an MP3 player, an ebook reader, a digital camera and a digital camcorder
- An augmented reality
- Multimedia playing
- M2M interface,
- eBook
- Several books in the pocket ready to read whenever one wants

c. Web Conferencing & Webinars

i. Web Conferencing

- Live meetings, training, or presentations via the Internet

- Each participant sits at his or her own computer
 - Connected to other participants via the internet
- ii. Attendees access the meeting by clicking on a link distributed by e-mail (meeting invitation) to enter the conference.

iii. Webinar

- Specific type of web conference
- Typically one-way, from the speaker to the audience with limited audience interaction, such as in a webcast
- Collaborative and include polling and question & answer sessions to allow full participation between the audience and the presenter.

d. eReader Devices and Software for eBooks

i. eBook reader e-paper devices

Device that uses epaper are mostly LCD or Touch Screen, such as. iPad, Sony eReader, Amazon Kindle, iRex iLiad, Hanlin eReader, CyBook by Bookeen, the Barnes & Noble nook. There are various software for eBook reading, such as, adobe, Office tools, Novel B&N eReader etc.

- Text can be searched automatically and cross-referenced using hyperlinks.
- A single e-book reader containing several books is easier to carry around (less weight and volume) than the same books (or sometimes even a single book) in printed form.
- Mobile availability of e-books may be provided for users with a mobile data connection, so that these e-books need not be carried around.
- E-books can allow non-permanent highlighting and annotation.
- Font size and font face can be adjusted.
- E-books may allow animated images or multimedia clips to be embedded.

e. Digital Library Revolution

For the first time in history, all the significant literary, artistic, and scientific works of mankind can be digitally preserved and made freely available, in every corner of the world, for our education, study, and appreciation and that of all our future generations.

f. Open Source Educational Websites

In an effort to improve upon the quality of Science Teaching in Maharashtra the Homi Bhabha Centre for Science Education has launched an Open Source Educational Website that provides educational material in Mathematics & Science in Marathi from Class 1 to Class 10. The 5 year Project received Rs. 69 lakh from the Rajiv Gandhi Science & Technology Commission (RGSTC). These concepts would be better understood in the mother tongue.

g. Tablets: Small Size Laptops

Small book size Laptops Android Operating System based having all connectivity ports, Touch Screen Wi-Fi & Blue Tooth have come up in the market.

h. Windows 8.0

Windows 8.0 having Touch Screen facility has come up. It is very compact. It's booting time is 5 to 10 Seconds.

Research Scenario

ET and ICT in Education

A sizable number of studies on effectiveness of CAI developed through various computer languages employing either pre-experimental design or quasi experimental design reveal significant mean score gain from pre-test to post-test. Studies on the effectiveness of CAI reveal favorable reactions of students and teachers towards the CAI. (Prabhakar 1989; Himani 1990, Mahapatra 1991, and Adhikari 1992, DAVV, Indore; Khiwadkar 1999, Zyoud 1999, Yadav 2000, Goel Khirwadkar Tomar Das & Joshi, 2000, Macwana 2004, Sharma 2005, Barot 2005, Pradesi 2005, and Rathod 2005, MSU; Suwana 2004, SGU; Upadhyaya 1999, MJP Rohilkhand University, Bareilly; Sanjana 2001, MDU and Pandian 2004, DU)

There have been found rare studies on the pedagogic/techno-pedagogic analysis of the computer based educational instructional programs. These studies reveal that there should be added focus on production variables, pedagogic principles and spatial and temporal contiguity of various message forms (Patel, 2001,MSU; Chaudhari,2005, MSU).

Computer as a medium has been found to have the potency of addressing the heterogeneity in terms of variables, namely, IQ, Interest, Motivation, Language level (Zyoud, 1999, MSU).

There are rare studies on effectiveness of CALM in various modes, namely, text, graphics, text & graphics, text, graphics & music. It has been found that the composite modes may not always ensure higher level of language learning (Das, 1998, MSU).

Very few studies have been conducted on the relative effectiveness of CAI with peer interaction in mono, diad and triad (Pardesi,2005, MSU).

Attempts have been made for designing, developing and implementing computer based Learning Resources Management System (LRMS). The automated LRMS has been found definitely more effective than the the manual LRMS (Beryah, 1995, DAVV).

A few studies have been conducted on the relative predictivity of various variables with respect to the criterion variable, namely, Educational Proficiency (Mishra, 1993, DAVV; Goel,2003, MSU).

A study conducted on Time Space Personnel Management System revealed that the computer based TSPM system was found relatively more acceptable and better functional than the manual TSPMS (Biswal, 1995, DAVV).

Though studies have been conducted on the automation of examination system, yet these studies find rare expression at the functional level. Teacher Education Institutions need to

promote Choice Based Credit System and on demand examination (Mahajan, 1993, DAVV; Joseph, 1993, DAVV; Shinde, 1993, DAVV; Goel, 1997, MSU).

A sizeable number of teacher education institutions in India have initiated into ICT in Education either as a core course or as optional course. In spite of the impeding factors, namely, limited staff, inadequate laboratories with maintenance problems, sizeable classes, the courses have been found to realize their objectives reasonably (Goel, Das, and Shelat, 2003, MSU). A sizeable number of teacher education institutions have been found lacking facilities, such as, Internet, MS Publisher, Acrobat Reader (Goel, 2005, MSU). A few studies conducted on the use of Internet in Teacher Education Institutions revealed that the student teachers largely lack in info-savvy skills and techno-pedagogic skills (Joshi, 1999, MSU; Dhodi, 2005, MSU) . Some of the teacher trainees make use of Internet for surfing, e-mail, research, core courses, special areas. But, the Internet is rarely used for web designing, reflective dialogue and outsourcing. Measures of Internet safety are rarely employed. There is a need to develop Net-Savvy Skills in Teacher Educator Trainees (Goel, 2006, MSU). Some Studies have been conducted on bridging the gaps between teaching styles and learning styles. The studies are appreciable but there is a need to conduct many more studies Rathod, 2005, MSU). Studies conducted on language instruction through Power Point Presentations on realizing communicative and functional languages have been found to go a great way in establishing the effectiveness of learning various languages (Yadav, 2005, MSU; Rathod, 2005,MSU). There have been rare studies on developing language learning strategies and learner autonomy through weblogs. Blogs not only provide teachers with an exciting new way to approach communicative language learning, these also give students a new reason to enjoy reading and writing. Goel C. & Goel D. R. (2006) conducted a study on Use of Internet in Teacher Education. Goel C.. & Goel D. R. (2007) conducted a study on Thematic Apperception of the M.Ed. Students through Technology Based Package and another study on Reflective Dialogue on Peace & Harmony through Technology enabled Narrations. Goel C. & Goel D.R. (2008) conducted a study – Technology for Wholistic Education. Nayana Dhodi (2011) demonstrated very well how the info-savvy skills of Asking, Accessing, Analyzing, Applying and Assessing were developed in the Pre-Service Teachers of

India. Pinkal C. (2012) conducted a study on e-learning approach to train novice teachers through Blended Approach. He used ,both, synchronous & asynchronous modes, that is, CDs, Web Based & other Learning Resources Face to Face and online discussion through Web-forums, respectively. Online discussions were found to be very joyful & useful. The Biology Teachers could generate new ideas. It was really an exhilarating experience. ***Educational Technology and ICT in Education have demonstrated their values. But, Technology in Education is not yet fully integrated.***

Teacher in the Digital Age: Challenges & Issues

The world is going digital. But there are many challenges & issues.

1. Shift to more powerful learning Paradigms

There is a need to shift to more powerful learning paradigms, such as, linear to hypermedia learning, instruction to discovery and construction, teacher centered to learner centered education, learning how to navigate and learn, teacher as transmitter to teacher as facilitator.

2. ICT illiteracy

It is an age of Information & Communication Technology, but a large number of teachers at all levels are ICT illiterate. The students being latest generation are excelling the teachers in ICT, being better exposed to ICT. Thanks to the Program Intel Teach to the Future which has had massive coverage of the teachers for ICT literacy.

3. Information Explosion & Knowledge Poverty

There is information explosion & media implosion in all facets of life & living, but still we teachers have knowledge poverty. It is because we have more of a media crowd than media culture. Most of us do not know where from & how to access information. We do not have adequate knowledge base of the URLs. Also, most of us are not skilled on surfing skills, such as, selecting, skimming, scanning, switching and authenticating.

4. Technology Alienated Education

We do not have Technology Integrated Education. On one side we have International Standard Digital Network, at the same time we do not have interconnected networks.

Even now the Technology has Guest Appearance in our Education. Be it digital lesson designing, use of MS Office, Web Based Educational Instruction, Educational Social Networking, e-Learning Resources Management System, Computer Based Time-Space- Personnel Management, Computer Based Teaching-Learning & Evaluation. Even in this Digital Age a large number of our Teachers from pre-primary to higher education are not Techno-Savvy, Info-Savvy & Net-Savvy. At the same some efforts, such as, Electronic Data Examination Processing (EDEP) by the Jawaharlal Nehru University of Technology, e-B.Ed. by MKCL, Computer on Wheels (COW) by the Intel, B.C.Ed. & M.C. Ed. by the DAVV, Indore are remarkable.

5. Analog to Digital: Fast Conversion, but, Slow Transition

Every where, we have digital products-wrist watch, wall clock, Radio, TV, Computer, I-Pad, I-Pod. But very often we teachers do not know how to reset a wrist watch or wall clock, what to talk of the high -tech. We do not know how this digital time is generated and displayed. Digital Technologies ought to be introduced right from the pre-primary level.

6. Thin Population of Techno-Savvy, Net Savvy and Info-Savvy

We have very thin population of techno-savvy, info-savvy and net-savvy teachers. It is because the education system as a whole has been relatively indifferent towards techno-culture. Our Educational Radio, Educational Television, Educational Computers, EDUSAT, SIETs have lost their Educational identities. But, still there is hope because some of the EMRCs are sustaining & enhancing their identities. It is because these have had a rich cultural heritage as well as will and zeal to modernize.

7. Rare expression of ICT Aided Constructivist Approaches in Education

The latest catchword in educational circle is constructivism which is applied to both learning theory & epistemology. Here the role of a teacher is as a facilitator who encourages learners to reflect, analyze, design and develop the process of knowledge construction and the learners are active agents who engage in own knowledge construction by integrating new information into their schema. Learning can be seen as a process that of understanding and contextualizing socially, culturally, historically, and

politically relevant issues. Hence it is important that the teachers' role has to be revitalized and the teacher education system has to inculcate the culture of germination of new ideas, incubation, innovation, creation and construction. Various models can be emulated, such as, 5E model-Engage, Explore, Explain, Elaborate & Evaluate, 7E model- Elicit, Engage, Explore, Explain, Elaborate , Evaluate & Extend. Every novel construction brings with it a novel approach.

8. Open Education Resources not fully functional

Open Education Resources for Learners & learning- Content (geogebra, google earth), Creativity (hot potato, C map), Evaluation (R-campus & Mahara), Open Education Resources for Teachers, Teacher Educators & Facilitating Learning- Learning Management System (Moodle & Wiki spaces), Teacher Managed Communication Platforms (Classroom 2.0 & Web Quest) , Statistical Tools for data processing, e-Journals, e-books, e-News Letters, Webinars & Web Conferencing are appearing . These need to be thoroughly inter-woven into our education system.

9. Rising Digital Learning Resources & Diminishing Creative Production

There is producer consumer dichotomy. The consumers have changed their tastes as per the tastes of the producers. Many a teachers have become dependent on what is available ready made. Earlier it was scissor cut and paste method. Now there is a shift to copy, block and paste. There is very often a gross lack of creativity in the Papers produced by the Teachers at all levels. In this digital age we as teachers need to learn to be prosumers. There should be an equation between downloading and uploading. We should be human source than resource. We need to exercise various system design considerations very carefully, such as, whether to build a system or buy a system, whether to go by a prototype or design a fully functional system, whether to use our own processor or use ready made calculator, whether to set a bio clock or to set a digital clock.

10. Digital Learning Resources System & Slow Pace

Most of the Libraries countrywide are house of hard books and Journals. There is a need to enrich the libraries through e-books, e-Journals, e-news letters, CDs, DVDs and Digital

Networking. Information explosion and constant geographical space demands storage of the learning resources to be in the digital form, the e-form. There is a need to modernize School, College, University and Public Libraries. The Educational Surveys by the various agencies and apex institutions, such as, NCERT, ICSSR should obtain digital forms for easy storage and retrieval. Teachers & Scholars should orient themselves in producing the learning resources & research resources in digital forms.

11. 3Rs to ICT literacy

Gone are the days of merely Reading, Writing and Arithmetic. Modern Society needs ICT literacy. Creation, & Communication of any message far & wide demands technology base. Any new valuable message should find technology base. Electro Magnetic Waves can travel with the speed of light which is 3×10^{10} cm/Sec. It is 7 times the circumference of the earth. Any teacher can reach out from north pole to the south pole within $1/14^{\text{th}}$ of a second in the digital form. Not only speed, but, quality of production can be realized in the near natural form by generating view compositions through audio, visuals, animation, color-hue & saturation.

12. Comprehensive Teacher Profile for Inclusive Education in digital age

Teacher for inclusive education in the digital age has to be highly versatile, resourceful and Techno-Literate, because, the inclusive class may be composed of audio impaired, visually challenged, deaf, dumb & children with learning difficulties & disabilities. In such a state a teacher has to provide differential inputs to this critical mass of the inclusive class. What my nation is doing for inclusive education? Not much. Packages like JAWS & Open Book are available for the Visually Challenged, with difficulty, but in English language only. Inclusive Education demands multi-sensory throw in the class setting, as well as, personalized education, and Group Education. Technology can be a big support for a teacher for realizing inclusive education.

13. Rare Info-Savvy Teachers

The digital age teacher has to be info-savvy. The teacher ought to be fully skilled on info-savvy skills, such as, Asking, Accessing, Analyzing, Applying & Assessing. Dhodi (2011) conducted a doctoral study on development of info-savvy skills in Secondary Student Teachers. Her study demonstrates very well how the info-savvy skills were developed in the Pre-Service Teachers of India through surfing on Cultural Heritage of India , Buddhist Heritage of India and on the domains of their respective discipline methods. Various surfing skills were employed, viz., skimming, scanning, authenticating, hyper-linking, switching, skipping, culminating into educational immersion for seeking solutions. But , the info-savvy teachers are very rare.

14. Teacher as a Techno-Pedagogue

The digital age teacher ought to be a techno-pedagogue. He should be fully proficient in applying the principles of Techno-Pedagogy, such as, Media Message Compatibility, Proximity of Message Forms, Integration of Message, Media & Modes, Media Language Proficiency, Message Authenticity & Media Fidelity. But, technology finds more of integration in other fields than in Education.

15. Teacher & Participatory Approach of Problem Solving

- The M.C.Ed. class (1992), DAVV, Indore was very often given a problem to be solved through a computer program.
- Number of different programmes would emerge from the entire class.
- Each program was presented by one of the programmers to the rest of the class and rated by all the students on different criteria, namely, compactness of source code, fetch and execute cycle size, response time, memory used, programming discipline level and programme intelligibility.
- Also, the students developed programme to calculate Kendell's Coefficient of Concordance through 'C' language. They then computed Kendell's coefficient of concordance individual criterion wise and with respect to the comprehensive criteria.

There is a significant cognitive development through cognitively mapping the algorithms and solution to a problem. This approach cuts across students of varied profiles, simultaneously. Participatory approach may be introduced in various disciplines to enhance learning in all domains. It facilitates creative production and independent thinking. Also, it provides scope to experience and appreciate the cognitive maps of others.

16. Technology Integrated Teacher Education

There is Technological revolution in Teacher Education. There is a shift from Bachelor of Teaching to Bachelor of Learning, that too, Bachelor of e-Learning. There is a shift from e-Learning 1.0 (Online learning) to e-Learning 2.0 (Twitters, Face-book) to e-Learning 3.0 (Semantic Web) , that is, from content to community to Artificial Intelligence. There is a quick shift from web-1 to web-2 to web-3. We have initiated into Open Education, Open Course Ware, Open Source Software, Open Content and Open Research. There are proposals for e-Teacher Education. Smart Classrooms are emerging, wherein, we have e-learning and e-testing. Terms like Wi-Fi, iPad, e-Book, e-Reader, e-News Letter, Webinar are widely used. Digital Lesson Designs and e-Portfolios have become common features. There are compendiums of e-abstracts and Surveys of Educational Research in India on the World Wide Web. The NCTE is expediting Teacher Education on e-Technologies through an MOU with the Intel. There is wide scope for transformation of Teacher Education through Technology.

17. Media for Equitable Education for All

There are a variety of media available every where. But, in this age of media crowd there is a problem of media culture. In this world of media implosion there is a problem of media choice. What to interact with, what not to interact with, what to view what not to view, is a big problem. Could media be used for equitable education for all?

18. People with Disabilities and Computer Technology

People with disabilities meet barriers of all types. However, technology is helping to lower many of these barriers. By using computing technology for tasks such as reading

and writing documents, communicating with others, and searching for information on the Internet, students and employees with disabilities are capable of handling a wider range of activities independently. Still, people with disabilities face a variety of barriers to computer use. These barriers can be grouped into three functional categories: barriers to providing computer input, interpreting output, and reading supporting documentation. Hardware and software tools (known as adaptive or assistive technologies) have been developed to provide functional alternatives to these standard operations. Every teacher employing Computer Technology for People with disabilities should be educated on such tools.

19. Teacher & Educational Technology

Every teacher in this information age ought to be Educational Technologist. Education has not been in a position to keep pace with the technological evolution. Technology is there in the industry, technology is there in commerce & business, technology is there in medical field, technology is there with the vendors & hawkers, but, rarely with teachers. We still have the luxury of chalk & talk.

20. Developmental Challenges & Technological Determinism

There ought to be Technological Determinism by the Education System to meet the developmental challenges in many a ways as follows:

- Computer Aided Admissions
- Computer Based Time-Space- Personnel Management Systems
- Computer Assisted Learning Material & CAI
- Mass Media in Education
- EDUSAT Programs
- Integrating ET & ICT in Teacher Education
- Computer Based Learning Resources Management Systems
- Networking of Educational Institutions
- Computer Based Evaluation
- Technology Based Guidance & Counseling Labs

- Educational Process outsourcing
- Identification of & Training on Techno-Pedagogic Skills
- ICT for the disadvantaged
- Development of various directories
- Development of CDs and Web Pages
- Studies on Media Challenges in Education

21. Development of Media Culture

Media & Technology in this digital age are the extension of human beings. These should be optimally generated & utilized for the realization of Happy, Productive & Peaceful life. Digital Technology has a lot to offer to the present day society. But, it demands civilized media culture. It is our choice to decide to make or mar ourselves through digital age. A digital age child has to be highly sensitive to the digital implosion. Teachers can educate a lot to surf & survive in this information ocean of tides & tornados.

22. Media Intimacy

A large majority of we teachers are not educated to identify most of the modern media. Neither we know their composition, nor do we know about their characteristics & functioning. We do not have Media Language Proficiency. So, we fail to receive through media & vice-versa.

23. Black & White Dichotomy

Should we use black board or white board? Should we use multiple touch or single touch screens? Can we compromise with the chalk & talk? Has it become a basic necessity to be fast? Do we like real? Can we afford to live in the virtual realm? Both the extremes are socially undesirable. Let us learn to achieve a balance between the real & virtual.

24. Technological Evolution & Teacher Renewal

The technology is evolving very fast. The information explosion is expected to be exponentially fast, because, the creation of the Creator is so deep & vast. By virtue of

Teacher Identity, a Teacher has to be the embodiment of all knowledge to sustain & disseminate the beauties of Nature. The Teacher ought to renew every moment.

CONCERNS

1. Techno-Friendly Teacher & Teacher Friendly Technology

We teachers should learn the latest technology. We ought to be interested in technology, value technology & have favourable attitude towards technology. At the same time the Technology ought to be Teacher Friendly. All forms of technology, such as, lap- tops, LCD Projectors, Radio, TV, Computers, Internet iPad, Mobile web 2.0, eBook & e-Reader should be accessible & intelligible to the teachers. In this age of globalization teachers every where ought to acculturate, trans-create and modernize themselves. Present day students are starving & striving for that.

2. Digital Technology Integrated Teacher Education

Teacher Education ought to be Digital Technology Integrated. ICT in Education, Digital Lesson Designing, Educational Web Designing, Web Based Instruction, Computer Based System Analysis & Designing in Education, Electronic data processing in Education, Production of Computer Assisted Learning Material, Digital Technology Based Courses & Programs should be integrated in Teacher Education Curricula.

3. Courses & Programs on Digital Technology

There should be courses & Programs on Digital Technology, such as, Digital Lesson Designing, Web Based Instruction, Designing e-News Letter, e-Book, e-Reader, Diploma of Digital Technology in Education, Bachelor of Digital Technology in Education , Master of Digital Technology in Education, There should be due focus on Digital Technology Education and Digital Technology in Education.

4. Professional Development Programs for Teachers & Teacher Educators on Digital Technology

There should be Professional Development Programs for Teachers & Teacher Educators on Digital Technology Education & Digital Technology in Education.

5. Employing Management Information System Series in all the Educational Institutions

Management Information System Series- constituted of Admissions, Time-Space-Personnel Management, Digital Libraries, CAI/CBL, WBI/WBL, Computer Based Evaluation, On line Testing, Paper less office & Digital Communication and full networking should be realized in Educational Institutions.

6. Choice Based Credit System & Sharing of Credits Between Teacher Education & Faculty/College of Technology & Engineering

There should be sharing of credits amongst Teacher Education Institutions & Faculties/ Colleges of Technology & Engineering on Technology Education till the Teacher Education Institutions become independent.

7. Specialization of Teachers on Technology for the Disadvantaged Students

There should be provision for specialization of Teachers on Technology for the disadvantaged learners, such as, Visually Challenged, Hearing Impaired, Deaf & Dumb, Autistic, Disabled. These teachers require very intensive & exhaustive education.

8. Technology Culture in Educational Institutions

There ought to be Technology Culture in the Educational Institutions. Every Teacher ought to be Techno-Savvy, Net-Savvy & Info-Savvy. ICT Aided Constructivist Approach should be practiced by every teacher for promoting Innovation, creation & construction.

9. MOU Between Technology Agencies & Apex Educational Institutions

There should be MOU between Technology Agencies, such as, Intel, NCTE, UGC, for developing rich Educational Technology Culture in India.

10. Developmental Challenges & Technological Determinism

There should be technological determinism for meeting the developmental challenges. Such an agenda should be scientifically decided by the Nation through various Institutions and agencies for various areas, such as, rural education, tribal education, girl child education, urban education, slum dwellers education, vocational education, Education on Health & Hygiene, Environmental Education, Life Skills Education, Education for Equity & Equality.

11. Educational Technology for Equitable Education for All

All sorts of Technology should be explored for equitable Education for all. Teachers have to flow through Radio, TV, Computer, Satellite, CD, DVD, Internet, World Wide Web to reach all. Now the question is what should be the profile of a teacher to reach through many varied media. A Teacher has to be fully technology literate. The Teacher has to be proficient on audio scripting, video scripting, computer programming, Software programming, Web Designing & Communication Protocols. The teacher has to be highly skilled on, both, production & consumption, uploading & downloading.

12. Teacher as Educational Technologist

Every teacher ought to be Educational Technologist. The teachers should have workable depth in all disciplines, Physics, Chemistry, Biology, Geology, Geography, Mathematics, Sociology, Psychology, Philosophy, Polity, Economics, Arts, Commerce, Humanities, Management, Group Dynamics, and Learning Theories. Over & above a teacher ought to be a good creator & communicator. Digital technology can facilitate, both, Creation & Communication of Information. The effectiveness of any communication depends upon the correspondence amongst Sender, Message, Medium & Receiver. Every teacher ought to be a communicologist.

Concluding Remarks

A large number of the teachers feel alienated and alone in this digital age of networking & globalization. It is because we do not have Technology integrated Education. We, the 21st Century Teachers are lost in the realm of technology. We are neither techno-savvy nor info-savvy. We travel through the media crowd without being sensitive to it. We need to modernize temporally, spatially, logically, epistemologically, and technologically. Technology can facilitate our transition from dot to globe and point to morphology. Radio is extension of our voice, TV is extension of our Views, Computer is extension of our brains, motorbike is extension of our feet, clothes are extension of our skin, cell phones, i-phones, multi media, i-Pads & e-Books & all other forms of technology are our extension. Technology can multiply the speed & life span. It can facilitate fast, full, meaningful life & living. At the same time, to overpower technological disease & discomfort we need to be sensitive to our basic values. If we fly high speed & high, then we need to learn cybernetic ally when to & how to exercise breaks.

Technology is well woven in almost all walks of life. But Education is relatively technologically backward. Every teacher should put in efforts to be techno-savvy, because it is Education and Education only which can deploy and integrate technology faithfully with a service motive. Indian Teachers are highly adaptive & highly innovative. Very willingly, and passionately they are living the technological era of information explosion & media implosion.

How can life be a network of arrays of innumerable skills, where, ideas spring, feelings flow, motor creates, spirit reins, and the self resonates with the sphere in this digital age? We teachers need to learn what to tweet, whom to tweet, how to tweet, when to tweet. How do I value face book? How should I construct my face book? Which messages should I yahoo via messenger? What should I SKYPE? What should I email? What should I Blog? Less Well's Model- Who, Says What, To Whom, Through Which Channel, and With What Effect needs to be employed in each communication. The communication has become very fast through email & gmail. We need to exercise instantaneous communication control, because, we cannot not communicate & communication is circular & irreversible. Internet- the World Wide Web is a universal network. Innovators & Creators, Crackers & Hackers all reside here. The 21st Century Teacher has to be really perfectly fully complete, otherwise, how to teach the innocent, dedicated, cultured, but, bewildered challenging learners.

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Basic Tenets of Qualitative Research

Chhaya Goel & Devraj Goel

In this age of virtual societies research has become a challenging task for a social scientist. As the process of modernization has been booming, the whole world is being virtually re-constructed as an electronic, timeless space-less, and sophisticated technical universal global sphere. There is spatial mobility, temporal mobility, social mobility and logical mobility. Our tastes have changed, our languages have changed, our life styles have changed. In this age of globalization we have started eating fast and foreign food. Every one likes to share the state with others. But, all seem to be full of their own problems, where is the time and space to receive and respond to the problems of others. We have lost our sensitivities to our basic values. Mediocrity is trying to administer and govern in every sphere. There are problems, questions, descriptions and their publications. Where are the solutions, answers, controls and regulatory mechanisms? Phenomenology, Triangulation, Ethnography and Grounded Theories all are frequently used but with little return. Our problems are multiplying and escalating. There are also many perspectives or schools of thought which interpret reality in different ways, namely, Empiricism, Marxism, Phenomenology, Naturalistic Enquiry, Ethno-Methodology, Scientific Relativism, Symbolic Interaction, Feminism, and Structuralism. There are various philosophical terms emerging in the context of qualitative research to realize better existence and living. There are various propositions, doctrines and principles of qualitative research.

- Let us begin with Survey the most common tool of social analysis. Useful as they are, though, surveys face a host of interpretive problems. The positive outlook of researchers is based on several basic tenets. First, the **'Objectivity Postulate'**: the realities that the survey tries to investigate would exist "out there", and would have a reality independent from the way in which the individuals perceive them. A second tenet of the positivist outlook on surveys would be the **'Transparency Postulate'**. But the search for a perfect, unambiguous, referentially transparent, purely de-notational language, is one of the characteristic longing of the positivist frame of mind. The third positivist tenet would be the **'Generality Postulate'**: the unequivocal meaning of the words and expressions involved in the research process. As a general rule, the more alien the subjects of the research are

regarding the social ontology that the researcher represents, the more likely it is that their answers appear as anomalous and inconsistent. Similarly, the wider the sociological scope of survey, the higher its semantic diversity is likely to be, and less the equivalence principle will work. A measure of socio-semantic distance between the items of a questionnaire may help solve the problem to a reasonable extent. Even in the mega research projects the field investigators and project assistants are very often neither fully qualified nor properly paid. So, is the status of the reality perceived. The raw data are very often more substantive and revealing than the processed data because in the absence of proper analysis the essence is lost.

- In experimental research, largely the scholars move from induction to abduction to thesis to analogy to facts to theories. But inconsistent scattered researches lead us nowhere. Social laboratory is a myth and figment of imagination. It has become essential to sustain social life that the social scientists evolve their own methods.
- In case study research diagnosis of a case is as important as prognosis of its disposition. But, a large majority of us have become excellent in describing the problems and cases, but we have become solution blind. Here the presage, process and product variables, all, need to be treated very carefully.
- Naturalistic enquiry which phenomenology demands needs to be conducted in an open, naturalistic, parametric setting. Because more and more are the controls in a social science laboratory, lesser and lesser is the generalization. The social science research can be better localized than universalized.
- Qualitative research cannot be conducted through a-priori samples only. Sampling goes on throughout research, through various sampling techniques, such as, typical case sampling, intensity sampling, critical case sampling, sensitive case sampling, convenience sampling, primary selection and secondary selection.
- Qualitative Research cannot be conducted through static tools and techniques, because very often the researcher employing qualitative research methodology does not have a sound theoretical base related to the reality. Theory in fact is the product of enquiry.
- Qualitative Research is affected by a wonderful interaction of subject and object. The object needs to be perceived as objectively and comprehensively as feasible.

- One of the basic tenets of qualitative research is awareness of one's own biases. There is a need to address diversity issues, such as, gender, race, religion, ability, sexual orientation, and socio-economic status. The pursuit of knowledge should be conducted with sincerity and care.
- Critical theory takes as a central concern the issue of power in the knowledge context. It focuses on how and in whose interest knowledge is produced and passed on. Where are the funds floated? What is the interest? What is the return on investment?

Focus of Qualitative Research

Qualitative research can focus on several aspects, such as, biography, phenomenology, grounded theory, ethnography, case study, anthropology, exploratory research, consultative research, community-based participatory research and service-learning.

- In **biographical studies** the investigator begins with an objective set of experiences in the subject's life, noting life course, stages and experiences.
- For **phenomenology** the investigator requires a solid grounding in the philosophical precepts of phenomenology. A careful selection of people who have or are observing the phenomenon has to be made.
- Instead of proceeding with a preconceived theory and set of hypotheses, **grounded theory** tries to study a phenomenon and a set of data in context through which the theory emerges. The phrase "grounded theory" refers to theory that is developed inductively from a corpus of data. If done well, this means that the resulting theory at least fits one dataset perfectly. In grounding theory building there are various phases, namely, open coding, axial coding and selective coding. Open coding is the part of the analysis concerning with identifying, naming, categorizing and describing phenomena found in the text. Essentially, the text is read in search of the answer to the repeated question "what is this about? What is being referenced here? Axial coding is the process of relating codes (categories and properties) to each other, via a combination of inductive and deductive thinking. Grounded theorists emphasize causal relationships, and fit things into a basic frame of generic relationships. The frame consists of elements, such as, phenomenon, causal conditions, context, intervening conditions, action strategies and consequences. In contrast selective coding is the process of choosing one category to be the core category.
- In an **ethnographic study**, a portrait is drawn of a cultural group or people. The researcher needs to have a sound knowledge in cultural anthropology and meaning of socio-cultural system as well as the concepts explored by ethnographers. The time taken for data collection is extensive, involving prolonged time in the field.

- In a **case study** a specific case is examined. It is exploration of a bounded system , bounded by time and space through detailed in-depth data collection involving multiple sources of information rich in variety. It is wholistic in nature and examines a real life situation.
- **Anthropology** more than any other social or behavioural science , has resisted simplistic, reductionistic explanations of social phenomena. The wholistic perspective encourages anthropologists, to consider a wide range of factors while attempting to understand human behaviour-biological, social, cultural, psychological, economic, political, ecological and many others. A fundamental proposition of anthropology is that no part can be fully or even accurately, understood apart from the whole.
- **Exploratory Research** is an early step in the research process used for identifying problems, solutions and other information needed to prepare for trials of improved practices. It includes in-depth interviews, observations, and focus group discussions.
- **Consultative research** uses interactive information gathering methods for data collection. During consultative research important scientific information and key cultural and personal concerns are examined, and changes in behaviour are negotiated.
- **Participatory Research and Service- Learning** have many common elements. Integrating academic content and service in the community can bring students a sense of connectedness between classroom learning and their personal lives and lives of others within the larger community. This is what the service- learning intends to. Community Based Participatory Research has an iterative process that provides an ongoing engagement between campus and community in terms of learning as well as the development of skills, capacity, and power. Learning for participants, community members and students is personal in terms of working closely with people with whom they would be very unlikely to interact. This contributes to building critical and civic consciousness.
- **Symbolic Interaction**

Basic premises and approach

With Symbolic interactionism, reality is seen as social, developed interaction with others. Most symbolic interactionists believe a physical reality does indeed exist by an individual's social definitions, and that social definitions do develop in part or relation to something “real.” People thus do not respond to this reality directly, but rather to the social understanding of reality, i.e., respond to this reality indirectly through a kind of filters or eyeglasses--perspectives. This means that humans exist not in the physical space composed of realities but in the "world" composed only of

"objects." According to Blumer, the "objects" can be divided into three types: physical objects, social objects and abstract objects.

Both individuals and society cannot be separated far from each other for two reasons. One, being that they are both created through social interaction, and two, one cannot be understood in terms without the other. Behavior is not defined by forces from the environment or inner forces such as drives, or instincts, but rather by a reflective, socially understood meaning of both the internal and external incentives that are currently presented (Meltzer et al., 1975).

Herbert Blumer (1969) set out three basic premises of the perspective:

- "Humans act toward things on the basis of the meanings they ascribe to those things."
- "The meaning of such things is derived from, or arises out of, the social interaction that one has with others and the society."
- "These meanings are handled in, and modified through, an interpretative process used by the person in dealing with the things he/she encounters."

Mind, Self and Society

"Mind, Self and Society" is the book published by Mead's students based on his lectures and teaching. The title of the book serves as the key concepts of symbolic interaction theory. The mind refers to an individual's ability to use symbols to create meanings for the world around him. Individuals use language and thought to accomplish this goal. Self refers to an individual's ability to reflect on the way that he/she is perceived by others. Finally, society, according to Mead is where all of these interactions are taking place.

The "I" and the "me"

While establishing the idea of self, Mead introduces a distinction between the "I" and the "me", respectively, the active and socialized aspects of the person. The "me" is a similar concept to Cooley's looking-glass self. An example of these concepts is the pygmalion effect whereby a person (I) behaves to match the sense of self (me) they derive from others, in a form of self-fulfilling prophecy.

Five central ideas behind symbolic interactionism

There are five central ideas to symbolic interactionism according to Joel M. Charon, author of *Symbolic Interactionism An Introduction, An Interpretation, An Integration*:

1. "The human being must be understood as a social person. It is the constant search for social interaction that leads us to do what we do. Instead of focusing on the individual and his or her personality, or on how the society or social situation causes human behavior, symbolic interactionism focuses on

- the activities that take place between actors. Interaction is the basic unit of study. Individuals are created through interaction; society too is created through social interaction. What we do depends on interaction with others earlier in our lifetimes, and it depends on our interaction right now. Social interaction is central to what we do. If we want to understand cause, focus on social interaction.
2. The human being must be understood as a thinking being. Human action is not only interaction among individuals but also interaction within the individual. It is not our ideas or attitudes or values that are as important as the constant active ongoing process of thinking. We are not simply conditioned, we are not simply beings who are influenced by those around us, we are not simply products of society. We are, to our very core, thinking animals, always conversing with ourselves as we interact with others. If we want to understand cause, focus on human thinking.
 3. Humans do not sense their environment directly, instead, humans define the situation they are in. An environment may actually exist, but it is our definition of it that is important. Definition does not simply randomly happen; instead, it results from ongoing social interaction and thinking.
 4. The cause of human action is the result of what is occurring in our present situation. Cause unfolds in the present social interaction, present thinking, and present definition. It is not society's encounters with us in our past, that causes action nor is it our own past experience that does. It is, instead, social interaction, thinking, definition of the situation that takes place in the present. Our past enters into our actions primarily because we think about it and apply it to the definition of the present situation.
 5. Human beings are described as active beings in relation to their environment. Words such as conditioning, responding, controlled, imprisoned, and formed are not used to describe the human being in symbolic interaction. In contrast to other social-scientific perspectives humans are not thought of as being passive in relation to their surroundings, but actively involved in what they do."

□ **Structuralism**

Structuralism is a theoretical paradigm in sociology, anthropology, linguistics and semiotics positing that elements of human culture must be understood in terms of their relationship to a larger, overarching system or structure. It works to uncover the structures that underlie all the things that humans do, think, perceive, and feel. Alternatively, as summarized by philosopher Simon Blackburn, Structuralism is "the belief that phenomena of human life are not intelligible except through their interrelations. These relations constitute a structure, and behind local variations in the surface phenomena there are constant laws of abstract culture".

Structuralism originated in the early 1900s, in the structural linguistics of Ferdinand de Saussure and the subsequent Prague, Moscow and Copenhagen schools of linguistics. In the late 1950s and early '60s, when structural linguistics was facing

serious challenges from the likes of Noam Chomsky and thus fading in importance, an array of scholars in the humanities borrowed Saussure's concepts for use in their respective fields of study. French anthropologist Claude Lévi-Strauss was arguably the first such scholar, sparking a widespread interest in Structuralism.

The structuralist mode of reasoning has been applied in a diverse range of fields, including anthropology, sociology, psychology, literary criticism, economics and architecture. The most prominent thinkers associated with structuralism include Lévi-Strauss, linguist Roman Jakobson, and psychoanalyst Jacques Lacan. As an intellectual movement, structuralism was initially presumed to be the heir apparent to existentialism. However, by the late 1960s, many of structuralism's basic tenets came under attack from a new wave of predominantly French intellectuals such as the philosopher and historian Michel Foucault, the philosopher and social commentator Jacques Derrida, the Marxist philosopher Louis Althusser, and the literary critic Roland Barthes. Though elements of their work necessarily relate to structuralism and are informed by it, these theorists have generally been referred to as post-structuralists.

In the 1970s, structuralism was criticised for its rigidity and ahistoricism. Despite this, many of structuralism's proponents, such as Jacques Lacan, continue to assert an influence on continental philosophy and many of the fundamental assumptions of some of structuralism's post-structuralist critics are a continuation of structuralism.

□ **Feminism**

Feminism is a collection of movements and ideologies aimed at defining, establishing, and defending equal political, economic, cultural, and social rights for women. This includes seeking to establish equal opportunities for women in education and employment. A **feminist** advocates or supports the rights and equality of women.

Feminist theory, which emerged from feminist movements, aims to understand the nature of gender inequality by examining women's social roles and lived experience; it has developed theories in a variety of disciplines in order to respond to issues such as the social construction of sex and gender. Some of the earlier forms of feminism have been criticized for taking into account only white, middle-class, educated perspectives. This led to the creation of ethnically specific or multiculturalist forms of feminism.

Feminist activists campaign for women's rights – such as in contract law, property, and voting – while also promoting bodily integrity, autonomy, and reproductive rights for women. Feminist campaigns have changed societies, particularly in the West, by achieving women's suffrage, gender neutrality in English, equal pay for women, reproductive rights for women (including access to contraceptives and abortion), and the right to enter into contracts and own property. Feminists have worked to protect women and girls from

domestic violence, sexual harassment, and sexual assault.^{[9][10][11]} They have also advocated for workplace rights, including maternity leave, and against forms of discrimination against women. Feminism is mainly focused on women's issues, but author bell hooks and others have argued that, since feminism seeks gender equality, it must necessarily include men's liberation because men are also harmed by sexism and gender roles.

Subjects for Qualitative Research

Qualitative Research cannot be conducted through apriori samples only. Sampling may go on throughout research. Various sampling techniques, such as, follows may be employed in qualitative Research:

- Typical case sampling
- Intensity sampling
- Critical case sampling
- Sensitive case sampling
- Convenience sampling
- Primary selection
- Secondary selection

Tools and Techniques of Qualitative Research

Qualitative Research cannot be conducted through static tools and techniques. Tools & Techniques are Very often functions of the field. Theory in fact is the product of enquiry. Tools and techniques of qualitative research are innumerable, such as, observation, interview, triangulation, Focus Group Discussion, Reflective Dialogue.

- **Observation** is a technique of data collection in which one or more persons observe the happenings in a relevant situation on the basis of pre-determined scheme. It could be participant observation in which the observer participates himself in said situation. In non-participant observation the observer observes the behaviour in real life situation.
- **Interview** is a two person conversation initiated by the researcher on content specified by research objectives of systematic description, prediction or explanation.
- **Triangulation** uses two or more methods to investigate to get a more complete, accurate picture of human behaviour. This can be done through convergence of gathering data from different sources through different methods.

- **Focus Group Discussions** are organized group discussions which are focused around a single theme. The group is a purposive sample-based on certain pre-determined criteria. Statement(s) of one person initiates a chain reaction of comments/ responses from other respondents. When a group deliberates over a theme/problem, many a time, there is an excitement among participants to put forward their views.
- **Email –Facilitated Reflective Dialogue** may be used to engage human service practitioners as partners in research about sensitive areas of front line work which otherwise can be difficult for a range of reasons, such as, time constraints, geographic limitations, trust in the research relationship, issue of privacy, and fear of professional judgment.

Assumptions for Qualitative Research

Assumptions are the beliefs which have never been tested nor testable at a given point of time. Very often the assumptions of a qualitative study are that the respondents would make authentic responses. No testimony is required of their responses. The investigator would make valid observations.

Formulation of A Qualitative Research Problem

The steps for formulation of a qualitative research problem are presented as follows focusing on some of the basic tenets.

1. Identification of a focus of interest or problem

Some of the problems identified are presented as:

- Study of the Process Issues for Organizing Research and Training in Distance Teacher Education
- A study of a 23 year girl having compulsive obsessive neurosis
- A Study of a five year child having learning difficulties seemingly due to inattention by parents and teacher and short attention span of the child
- A Study of 12 year girl having obsessive neurosis

Very often the problem titles are broad having specification of limited domains and variables.

2. Feasibility of the Study

Prior to taking off, the feasibility of the studies needs to be examined from various angles, such as,

- Technological
- Procedural
- Legal
- Ethical
- Social
- Economical

3. Objectives of the Study

The objectives of the studies need to be enunciated as specifically and inter-connectedly as possible. The objectives corresponding to the problems stated above could be as follows:

Problem-1

- To study the process issues in organizing research, organizing support services and developing and using media and materials in distance teacher education.

Problem-2

- To diagnose the case.
- To suggest prognosis for its disposition.

Problem-3

- To assess the needs of the child.
- To devise suitable teaching programs for implementation in individual, small group or class setting.
- To provide specific advice, programs and materials to enable class teacher to consolidate and extend the learning of the child on the case load.

Problem-4

- To find out the causes of the obsessive neurosis of the child.
- To suggest remedies for relieving the child of the disease.

4. Formulation of hypotheses, propositions or research questions

There is no piece of research without research questions. But hypotheses and propositions emerge only on having thorough understanding of the number and nature of variables related to the problems and their inter-relation.

5. Decision regarding the Research types and Methods

Decisions regarding the research type and methods to be employed are guided by the nature of problems. For problem 1, both, quantitative and qualitative research may be conducted. It may employ status survey method. Problems-2, 3 & 4 demand more of case study approaches.

6. Population and Samples

For problem-1 all the distance teacher education institutions may constitute the population for the study. One of the distance teacher education institutions may be identified purposively for the study of process issues in teaching and research. Then the different samples may be identified for naturalistic enquiry, some a-priori and others during process. Problems- 2, 3 and 4 are single case studies.

7. Tools and Techniques

Semi structured interviews may be developed for studying process issues in organizing research, organizing support services and developing and using media and materials in distance teacher education. Problem-2 requires study of the girl by a Psychologist, Psychiatrist and Social Worker. Problem-3 requires observation of the child by the expert, interviews with the child, parents, teachers and peers. Problem-4 requires observation of the child at home, in school, interviews with the child, parents, teachers, and peers. Also, some tools may be developed/selected for the diagnoses of the children.

8. Data Analysis

The data could be analyzed for problem-1 through content analysis and frequencies and percentage responses. The data with respect to problem-3 may be analyzed through increase in attention span. The data with respect to problem-2 and 4 may be analyzed through reduction of obsessive neurosis.

Some Reflections

Presented below are two illustrations for reflection:

- A child of about 5 years plucks a wild flower in full bloom and asks his father to fix and display it on his shirt.

How to study this phenomenon?

- Why did the child pluck the flower?
 - Does the child have aesthetic sense?
 - Does the child have concept of life and death?
 - How does this phenomenon affect the environment?
 - What was the objective of giving the plucked flower to the father?
 - Was it a joyful activity for the child?
 - How does the mother plant feel?
 - How about the state of the immediate community of flowers?
 - Who all are sensitive to the phenomenon?
 - How about the feelings of the squirrel, butterfly and birds?
 - Is there any theory governing the plucking of flowers?
- The frequency of mental illness has been found significantly high in Dangs in Gujarat.

How to conduct the naturalistic enquiry and produce an ethnographic scenario?

- Who should conduct such a study?
- Can such a state be attributed to early child marriage?
- Are there some historical hereditary reasons?
- Which tools and techniques could be employed for such a study?
- How to relieve the Dangs of the disease?
- What could be the relative roles of the universities, communities, and society at large?

Concluding Remarks

The qualitative research, be it any type, is wholistic in nature. It not only cuts across the commonalities, but is inclusive of unique features of each constituent of the phenomena under study. We need to appreciate logical positivism as well as scientific relativism. Empiricism has its own strengths and limitations. There is reality in this cosmos not obeying scientific laws. There are fields and attribute values which are not amenable to senses. Intuition has its own strength. Grounded theories and thick descriptions require research rigor and research depth. A large number of researchers

leave the relationships at linear levels. There is a need to theorize. There are innumerable questions which every researcher needs to focus, such as,

- How do I identify my own professional needs and values?
- What possibly are the causes, that is, active variables and context, that is, background variables?
- Which are the moderating variables and intervening conditions with mediating variables?
- How do I formulate a research focus?
- How do I formulate a research approach and justify it?
- What ethical principles should guide my research?
- How should I collect data?
- How do I reduce bias?
- How do I analyze data?
- How do I formulate research syntax?
- How do I build a theory?
- How do I monitor change?
- How do I generate professional development through research?

Scattered inconsistent researches take us nowhere. There should be continuity of research area. Research culminating into mathematical equations to the reality is the climax. But social reality is too complex to be represented through mathematical equations. On the other hand qualitative research demands competent, seasoned, dedicated, empathetic scholars. Nomothetic research though cutting across the commonalities, has drawbacks due to the missing ideographs. All forms and all types of researches together are too limited to understand the social reality.

Ethnography has been marginalized for long because it has been subversive to positivistic and entrenched conceptions of research rigor, and its privileged alternative ways of thinking, knowing and viewing the world. Qualitative methods have also resulted from the failure of experimental approaches to answer critical questions asked about the field. Due to enormous un-wielding problems, we need to course and recourse through qualitative research in the true sense. Qualitative research methodologies demand open, empathizing, dedicated, competent, faithful, ethical, integrated, interdisciplinary personalities.

Basic Tenets of Qualitative Research: Some Self Check Questions

1. What is quality?
2. What is qualitative?
3. What are the characteristics of Qualitative Research?
4. Which are the sampling techniques employed in Qualitative Research?
5. At which stage of Research sampling is done in Qualitative Research?
6. Which tools & techniques are employed for Qualitative Research?
7. Which data analysis techniques are employed for Qualitative Research?
8. How is the Research Reporting done in Qualitative Research?
9. What is the criticism against Qualitative Research?
10. What are the prerequisites for employing Qualitative Research?
11. How is a Grass Root Theory developed?
12. What are the characteristics of various Qualitative Research Methods, namely,
 - Biographical Studies
 - Phenomenology
 - Grounded Theory
 - Ethnographic Studies
 - Case Studies
 - Anthropology
 - Exploratory Research
 - Consultative Research
 - Participatory Research
 - Symbolic Interaction
 - Structuralism
 - Feminism, and
 - Naturalistic Enquiry?
13. Can sampling be done a-priori for Qualitative Research?
Reflect
14. Can tools & techniques be decided a-priori for Qualitative Research.
15. Why qualitative research is most frequently talked, but, least in practice?

INNOVATIONS IN TEACHER EDUCATION

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Module
Structure

Sr. No	Title
1	Objectives
2	Expected Outcomes
3	Introduction
4	Innovative Practice
5	Need of Innovative Practice in Teacher Education
6	Deployment of Innovations
7	Ways Ahead
8	Conclusion
9	PPT on Innovations in Teacher Education
10	MCQs on Innovations in Teacher Education
11	Hyperlinks
12	Bibliography and Webliography

1. Objectives

- To provide effective learning environment for facilitating learning of the student- teachers
- To enhance their professional development
- To encourage self-evaluation, accountability, autonomy and innovations in teacher education

2. Expected Outcomes

After going through this module the student-teachers will be able to;

- define Innovation
- explain the need of innovative practices in Teacher Education
- explain the concept of innovative practice
- explain the role of teacher educators in implementing innovative practices
- define the steps of implementing innovative practices

3. Introduction

The pattern of Education is changing very fast. Many a new phenomena, viz., Scientific and Technological advancement, Industrialization, Globalization and Modernization have emerged in the Society. Education is a discipline for preparing to meet the challenges to lead meaningful life. The modern generation needs compatible skills, updated knowledge, latest information of changing social needs, technologies and attitudes to make them fit to survive gracefully. Lifelong and continuous learning is the need of the modern age to empower the modern generation. So, there is need Powerful Education System. UNESCO's Commission on Education (1972) declared that education is a lifelong process and its purpose is to establish a learning society, i.e., a society that knows how to learn, to grow and to transform itself to the needs of ever changing world. It is only through learning that one acquires knowledge and this knowledge comes mainly through education. The process of education is shaped and moulded by the human personality called the teacher, who plays a crucial role in education of country. In order to meet the demands of globalization the educational system of the country needs more efficient, as well as, competent teachers. The quality of teachers mostly depends on the Teacher Education Programme of any nation. National Policy on Education (NPE, 1986) has rightly emphasized, "The status of teacher reflects the socio-cultural ethos of the society and no people can rise above the level of its teacher. Good teachers are concerned it can be produced only when we have good and effective Teacher Education Programme."

According to National Curriculum Framework for Teacher Education (NCFTE-2009), 'A teacher needs to be prepared in relation to the needs and demands arising in the school context, to engage with questions of school knowledge, the learner and the learning process. The expectations of the school system from a teacher changes from time to time, responding to the broader social, economic and political changes taking place in the society.' On this background of demand and expectation from schools and society, Teacher

Education Programmes need to be strengthened in all aspects adding innovative ideas and practices.

4. Innovative Practice

An innovation means an idea or practice perceived as new by the adopter. Oxford Dictionary defines innovation as ‘the action of innovating, the introduction of novelties, and the alteration of what is established by the introduction of new elements or forms’.

The concept of ‘innovation’ has been defined in different ways.

Ryan & Gross (1943) have comprehensively defined the word innovation as “New ideas are generated or invented in systems. These new ideas are located from various sources and are given appropriate shape according to the needs. The process involved in creating a new idea is called the process of developing innovations. The process of innovations involves various stages; these are: locating the need for developing new ideas, awareness, and source of getting information, administration of innovation, teamwork and flow of communication, decision making and characteristics of innovations.” Whereas, Burnett (1953) has defined that innovation is the new thought which is qualitatively different from the existing form. Clapham (2003) states that “the word innovate comes from the Latin word ‘innovare’ which means to renew, to make new”. Therefore, by definition, an innovation can be a renovation of a theme or a variation of an idea. Kostoff (2003) also suggest that “innovation reflects the metamorphosis from present practice to some new, hopefully, ‘better’ practice”.

According to Lu & Ortlieb (2009) critical reflection is one of the requirements for innovation particularly as it relates to successful teaching. Innovative by definition means forward-moving, and advanced; it is synonymous with creative, inventive, and fresh. Innovation as it relates to teaching is “experimentation with and the transformation of pedagogical practices, curricular approaches, student assessments and professional collaboration” (Ellison, 2009, p. 31).

Mangala (2010) defined it innovation as a change made in old practices, introduction of novel ideas and concepts, invention of new products, promotion of new ideas.

National Knowledge Commission (NKC) defines Innovation in the following manner for the purposes of this countrywide survey:

Innovation is defined as a process by which varying degrees of measurable value enhancement is planned and achieved, in any commercial activity. This process may be breakthrough or incremental, and it may occur systematically in a company or sporadically; it may be achieved by:

- introducing new or improved goods or services and/or
- implementing new or improved operational processes and/ or
- implementing new or improved organizational/ managerial processes

Rogers (1995) defined innovativeness as the degree to which an individual is relatively earlier in adopting new ideas than the other members of his system and remarks that if the idea seems new to the individual, then as far as he is concerned, it is an innovation. Innovativeness of an institution depends on how much freedom does it enjoy to make decisions to experiment, try and adopt new ideas and practices. Not only the freedom from the external imposition of decisions does to make a favourable climate for the adoption of innovations but also the system within the organization needs to be made receptive to new ideas and practices. If every member has the freedom and there by develops a will to try for him and identify his personality with the practice that he is called upon to implement, there is every likelihood that he will strain every nerve to adopt and maintain innovations. Thus, innovation can be understood as promotion of new ideas, administering them to replace the old practices which do not suit the needs of the society.

5. Need of Innovative Practices in Teacher Education

Entering into the 21st century today's school curriculum is becoming increasingly complex. Many new areas of knowledge are getting integrated into it. The methodology of curriculum transaction is also undergoing transformations. There is a major paradigm shift in the instructional methods with the change of time. To be competitive in the period of globalization it is important to change our traditional methods to meet the challenges posed by the global markets. To meet these demands, a teacher must supplement or replace traditional methods of instruction with innovative educational experiences.

The UNESCO Report of the International Commission on Education in the 21st century (1996) strongly believes that the rethinking of Teacher Education is necessary in order to bring in future teachers' precisely those human and intellectual qualities that will facilitate fresh approach to teaching. The NCTE after becoming the statutory body brought out a discussion document on Curriculum Framework for Quality Teacher Education (1998) in order to give a new look to the Teacher Education. Although various measures taken to improve the quality of Teacher Education have brought out changes in the system. But these developments and transformations have not been able to bring a change in the Teacher Education Programme as envisaged in NPE (1986-92)

The National Policy on Education, (1986) has rightly stated, "No people can rise above the level of its teachers." So for the development of the country, it is very important to have good teachers and good teachers can be produced only if we have a good system of Teacher Education and dedicated and efficient teacher-educators. According to NCFTE (2009) there is also a dire need to critically review the secondary Teacher Education system. The one-year second Bachelor's degree (B.Ed.) model seems to have outlived its relevance. With the increase of B.Ed. colleges, particularly with privatization and commercialization, B.Ed. programmes have become weak both in theory and

practice. Even the few institutions, which keep struggling to make this programme meaningful, find it difficult to overcome the structural constraints that the short duration of the programme poses. According to Singh (2008), one way to improve the situation is to absorb the innovation in the field of Teacher Education because modernization of education depends to an extent on modernization of teacher. He further states that “there is a need to revamp today’s Teacher Education system in tune with the changing needs of the society and particularly changing needs of school education”. In Teacher Education Programme efficient and good teachers are prepared who always try to introduce new ideas, techniques and practices in classroom transaction, curricular or co-curricular activities. Thus, it is imperative that the teacher must go through the innovative process of Teacher Education so that they become innovators in their spirit and continue to try out and adopt innovations in their own situations.

More than thirteen decades have passed since the Hunter Commission has made the recommendation for having Trained Teachers. Even after the biggest initiatives of establishing NCTE, DIETs, CTEs and IASEs after NPE 86, the gap is still continuing reflecting on the present system of education. Teaching is still not viewed as a profession and Teacher Education is still conducted in isolation

Breaking this isolation and making teaching and teacher dynamic is not an simple task because of

- the change in the role of the teacher
- the tremendous changes emerging in the various fields impacting education
- the change in the orientation styles of teaching
- the need for Teacher Education to align to continuously evolving policies and acts.

Sharma (2010) while reviewing Teacher Education in his paper proposed that more emphasis on practice teaching should be given, refresher courses must be organized and research work in Teacher Education should be strengthened. Das

(2010) reported that in addition to instructions, teachers need to innovate and conduct research for their self renewal, keep abreast with changes in education, develop expertise for effective implementation of every new innovation. In this regard action research on the part of teacher-educator can be considered most essential. The National Curriculum Framework (NCF-2005) also emphasized on innovations and good practices in Teacher Education.

6. Innovations in Secondary Teacher Education Programme

With the passage of time, there have been some innovations in the field of Teacher Education which have brought out significant changes and improvement in Secondary Teacher Education Programme. Some important areas of secondary Teacher Education in which innovations attempted are:

Adapted from (Charlu, 2000)

A. Innovative Approaches of Practice Teaching:

- a. Micro Teaching Techniques/ Simulation
- b. Organization of Internship/ Block teaching
- c. Evaluation of student teachers by subject specialists that is education staff (Method master) and the practicing classroom teacher.
- d. Different types of School Experience – GSHSEB, CBSE, IB

B. Improvement in the methods of teaching through:

- a. Team teaching
- b. ICT based Teaching
- c. Cooperative Learning
- d. Workshop in teaching
- e. Seminars and discussions
- f. Educational Fieldtrip
- g. Action Research
- h. Project Work

C. Developments in science and technology, rapidly increasing communication network and mass media:

- a. E-learning
 - b. Distance Learning
 - c. Teaching and Learning with ICT
 - d. Training through Tele Conferencing.
 - e. Computer Assisted Instruction (CAI)
 - f. Computer Managed Instruction (CMI)
 - g. Computer Based Multimedia (CBM)
 - h. Instructional Television
 - i. Interactive Video-conferencing
- D. Innovative Approaches of Evaluation:
- a. Peer Group Evaluation
 - b. Continuous Comprehensive Evaluation (CCE)
 - c. Semester system
 - d. Grading system
 - e. Viva-voce
 - f. Choice Based Credit System
 - g. Formal and Informal Evaluation
- E. Innovative Special Areas:
- a. Life Skill Education
 - b. Constructivism
 - c. Multiple Intelligence
 - d. Environmental Education
 - e. Guidance and Counseling
 - f. Yoga Education
 - g. Special Education
 - h. Advanced School Administration

Along with the above innovative practices Goel & Goel (2010) listed some innovative approaches that could be incorporated in Teacher Education.

1. Integration of Micro - Teaching Skills
2. Integration of Life Skills
3. Integration of Techno - Pedagogic Skills

4. Problem Solving Through Participatory Approach
5. Personalized Teacher Education
6. Integrated Teacher Education
7. Specialized Teacher Education
8. ICT Mediated Education
9. Bridging the Gap between the Teaching Styles and Learning Styles
10. Developing Integrated Thinking Styles
11. Choice Based Credit System
12. Electronic Distribution of Examination Papers (EDEP)
13. Double Valuation
14. Total Internal Continuous Comprehensive Evaluation
15. Constructivist Approach
16. Research through novel approaches
17. Wholistic Approach

There are many innovative practices mentioned above for strengthening Teacher Education Programme which are very essential.

6. Deployment of Innovation

Today in this 21st century our education system is changing very fast. Quality professional development of student-teachers should be upgraded to compete with the present time, and adaptation of this practice has had significant implications for enhancing quality of the professional development of student-teachers. This continuous process of gaining new knowledge, refining skills, adopting new methods are essential in enhancing the quality of teachers trained in Teacher Education institutions. To adapt such practices, guidance and motivation are essential to make student teachers achieve their goals. Along with that students have to exchange ideas, thoughts and knowledge thus gained will help to focus their attention on the development of listening and speaking skills and to promote thought and connections between students' ideas and the concept.

To implement such practices, there is a need of necessary sources and Resources which are,

- Administrative and academic reforms to facilitate change.
- Teacher Educators who are committed and knowledgeable about the process.
- The major forms of learner support comprise print materials and multimedia resources. In developing these materials, team approach can be adopted which involves sharing of academic expertise from different institutions.
- The role of Teacher Educator has to be supportive who guides, facilitates and acts as a facilitator of learning experiences.
- Time and commitment of the faculty
- Teacher Educators who are knowledgeable to guide the student-teachers
- To adopt such a practices requires a clear understanding about its purpose, but needs an atmosphere which accentuates favourable conditions for learning through the encouragement which should be given by the Teacher Educator in the particular institute.
- Teacher Educators who are committed and knowledgeable to direct the student-teachers for the Script Writing.
- It is required that physical or Infrastructure facilities are created for the ICT integration in day to day teaching. The various facilities such as Computers, Internet, LCD facilities will have to be provided. Learning Resources, such as, audio resources, video resources, animation movies, and clips should be made accessible.
- If student-teachers are expected to initiate the use of ICT in their teaching as well as in training, the Teacher Educators must be confident in using ICT in transaction of curriculum. For this Teacher-Educators should have the required professional competencies and training.
- Academic reforms to facilitate change.

7. Ways Ahead

In education, the word 'innovation' is used to describe a deliberate attempt to improve educational practices. Innovations do not come out of despair - they are first conceptualized in the need situation and then are implemented after long testing. Havelock (1973) pointed out "when we use expression like 'innovation in education' we think we are talking about something positive, a change for the better of something that is both new and beneficial".

The process of innovation includes activities like - a felt need, analysis of the present situation, planning of innovative/changed situation, testing and validating of innovation and finally implementing to find out how much improvement can be brought. Thus it becomes a model of educational change. It can be said that innovation is a change which is planned and formulated for the betterment of the system on which it will get implemented. Education is a process that involves from time to time as the practices of teaching and learning get affected by a variety of factors. Innovations in the field of education are purposeful changes which are brought in to make the process function at the desired level.

The interpretation given to 'innovation' at the 1986 Ministerial Conference in Singapore was 'innovation for development,' in which the process of development was seen as a means of bringing about certain fundamental and pervasive transformations in motivations, attitudes, habits and modes of thought and work in other words, if education is not to be relegated to the role of eyewitness in the development process, it should become an active participant in the necessary social changes. Although there was some disagreement among writers on the subject, specific characteristics of an innovation can be stated as follow.

1. It introduces a new or novel element which deviates from existing structures and/or procedures and is orientated towards the values of the society.

2. Its specific objective and/or purpose are relevant to the needs of the community and related to national development.
3. It has potential for diffusion on a large scale and is renewable from time to time based on appropriate feedback and the context for adoption and adaptation.
4. The innovative process should involve a scientific approach before being either accepted or discarded.
5. During the experimental stage, an innovation should permit flexibility on the basis of monitoring and evaluation.
6. It should be both cost and time effective, communicable, implantable in other situations. Reliability, with or without adaptation, should be a criterion for innovativeness.

However, while it is desirable to have a curriculum that is balanced, relevant, interesting and useful, curriculum innovations run into a particular stumbling-block. If the teachers do not understand the reforms, cannot apply them, and/or are not committed to them, they will not be able to carry out the reforms. Neither teachers nor anyone else can be easily won over to change, particularly when that change entails considerable inconvenience, hard work and loss of time, and also carries with it the implication of what they were doing before was inadequate. Unfortunately, there is no single suitable answer to the question: What will best improve quality? Regrettably, too, some investments may result in greater dividends in the long term than in the short term. If organization, management and planning are of importance in the day-to-day pursuit of quality and efficiency, they are even more important in the undertaking of innovations. There are three critical aspects of the innovation process. First, the prototype innovation has to be created - devised from the beginning, adapted from something existing or imported from elsewhere. Second, it has to be introduced into the system somewhere (usually on a small scale). Third, it has to be spread throughout the system. It has been established that carefully planned designed development was useful for ensuring that prototype innovations. It has also been established that planning is necessary to

enable innovations to be judiciously introduced into the system (usually on a small scale and as a trial). However, what is not so readily recognized is that the (large-scale) implementation of an innovation, spreading it throughout the system, requires its own separate planning as well. Many innovations have failed simply because the ways of moving from the experimental and introductory stages into widespread application have not been adequately worked out.

According to Roger (1983) there are various stages of adoption of innovative practice which adopters follow to adopt the particular practice i.e. awareness, interest, evaluation, trial and adoption. The person or institution first becomes aware of the particular innovative practice which already exists or newly introduced. Interest in the particular practice will lead to evaluation of innovative practice in terms of objectives of the programme. On finding it useful, it may be tried out in the concerned programme and if found suitable may be adopted, permanently.

Figure_1: Process of Adoption of Innovation



Awareness: At this stage the potential adopter is passively exposed to the innovation with varying degrees of acquisition of information and motivation. The initial awareness tends to snowball gradually, owing to increasing exposure to multiple media or heightened interaction leading to development of need.

The new knowledge, that go through the shell which envelop educational systems, originates from various sources i.e. books, journals, media, abroad

visit, professional meetings, other colleges, universities, Seminars, Workshops, University Grants Commission, change agents, discussion with colleagues etc. Some new idea may evolve from the experiences, reflections and insights of creative educationists.

Interest: The realization of the need and the growing motivation prompts the adopter to the next stage of interest and he/she begins to seek more information regarding the innovation. However, the person may still be undecided about the utility and desirability of the innovation at this stage. At this stage, his/her search for information becomes more purposive and selective and the degree of psychological involvement increases.

Evaluation: At this stage the potential adopter considers the pros and cons of adopting the innovation in his/her context and conducts a trial, and searches new ideas possible.

Trial: This is a crucial stage at which the innovation is partially tried out in the local context or personal situation of the user. Its usefulness and functionality are closely observed and judgments are drawn about its potential benefit or harm to the system. The outcome of this trial will either inhibit the user, with regard to the final installation of the innovation.

Adoption: After the trial is evaluated the final decision is made either to practice or not to practice innovation, resulting in its adoption or rejection. At this stage appropriate adaptations or modifications of the form and content of the innovation may be effected to suit local conditions. Adoption leads to the internationalization and institutionalization of the new concept or procedure or practice in the user system.

In this study the process of innovation was not studied since the survey did not aim at it. But the investigator has tried to study about the details of a particular innovative practice and the factors that are facilitating and impeding on it.

8. Conclusion

By way of conclusion, it can be stated that innovations have brought significant improvement in the field of teacher Education. These should be conducted on continuous basis so that future challenges can be faced.

Check your Progress

1. Explain the meaning of innovation in Teacher Education in your own words.

2. Which author related the word “innovation” as ‘new thought which is qualitatively different from the existing form’?

- a) Mangala (2010)
- b) Ryan & Gross (1943)
- c) Burnett (1953)
- d) Clapham (2003)

3. Arrange the steps for implementation of any educational Innovation in logical order.

- a) Awareness
- b) Evaluation
- c) Adoption
- d) Interest
- e) Trial

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Methodological Issues of Research in Teacher Education

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Research Methodology has lot to do with the research. It is the heart of the research. The methodological of educational research are based, in most instances, on research methods in the behavioural and social sciences, relying most heavily on psychology, sociology and anthropology, because research in these fields emphasizes logical-positivism, which uses experimental and quantitative research methods, most educational research also utilizes these methodologies. Educational Research is very often blamed to be descriptive and evaluative, rather than suggestive and contributing to policy formulation. There are wide gaps amongst developmental challenges and educational research determinism. Hardly 1% of the GDP is being invested on Research and Development in India. Problems are published everywhere. But, the solutions are rarely visible

1. More of descriptive & Evaluative Research than Suggestive

Educational Research is very often blamed to be descriptive and evaluative, rather than suggestive and contributing to policy formulation. There are wide gaps amongst developmental challenges and educational research determinism. Educational Researches are more of descriptive in nature which consists of Assessment and Evaluation, only describes and interprets what is. It is concerned with conditions or relationships that exists, opinions that are held, processes that are going on, effects that are evident or trends that are developing. Assessment describes the status of the phenomenon at a particular time. It may deal with prevailing opinion, knowledge, practices or conditions. These are more of describing the phenomenon rather than providing more positive solutions and suggestions to improve and develop the same phenomenon.

2. Stereotyped Educational Research

Research by the virtue of its nature is innovative, searching for the clarification again and again in different ways and means. We have great many numbers of researches which do not find expression at the grass root level. There are innumerable reasons for this, but at the research point of view, the research needs to be innovative, should focus on the need of educational society. As the society is diverse, schools are diverse and the learners are diverse equally the research needs to be divergent. They should zoom out and zoom in. Educational Research perhaps needs the big attention of scholars, government and public organizations, as Education has become the essential factor of the life, the research related to educational factors really play a vital role on developing the future of education in India.

Research in education is replicate and repetitive devoid of freshness, either of problem or of approach or of methodology. The national agenda for research needs to be developed in alignment with the developmental objectives. A prospective plan for research and innovations should be framed with regional and national developmental priorities. The research methodology must be compatible with the local problems. There is a need to be innovative. There are mismatches between research trends and problems. Regulatory mechanism to tone up the research quality needs to be evolved. There is a need to evolve research quality indicators. There is a need to evolve social sciences compatible indigenous research methodology. Philosophical & historical studies are very rare. There is more of quantitative research than qualitative. So the stereotypism is no more acceptable in the research society, it needs to be divergent, updated and truly a need based one.

3. Rare Innovative Research

Where the ideas spring, feelings flow, motor creates, nature blooms, self with environ resonates, the spirit reins, there, we innovate, construct and create. The soul of a gardener resides in the seeds, the soul of philosopher resides in the mind, the soul of piper resides in the pipe, the soul of a singer resides in the voice, the soul of a dancer resides in each & everybody cell, the soul of a poet wanders in the nature, the soul of a sculpturist resides in the stone, the soul of a teacher wanders with the learners. Dancing crops, flowing wisdom, enchanting music, touching songs, resonating dance, immersing verses, speaking sculptures, and enlightened learners are the wonderful springs of nature. Teacher Education is a

discipline which educates the progressive generations on what has gone by, where we are, where we want to go, and what we like to create, observing healthy, meaningful and long life. Innovations in Teacher Education & Research in Teacher education are very rare.

It may be attributed to various factors. Innovative Researches needs lots of support from all surroundings of the society, Novel ideas do not incubate because of the adverse external conditions. There are wide gaps between the visionaries and actors. So, very often the innovations have short life and die down in the institutions, where these originate. Sometimes, the most innovative programs fail in the formal system, because, these are beyond the view & purview of the apex bodies. Four year Integrated Secondary Teacher Education Programs need excellent Teacher Educators who are Philosophers of basic Disciplines, as well as, Education. Such a combination is rarely found. In addition to this, these need to have scope for vertical mobility. Activity based, Personalized Teacher Education Programs though originated with zeal, yet need to struggle to sustain themselves in the forms envisaged.

Novel ideas die because of non-incubation. Personalized Teacher Education, Wholistic Teacher Education, Specialized Teacher Education, and even Integrated Teacher Education are rarely found because we don't have the capacity to tolerate repeated failures arising out of experimentation. One shot success is a fairy tale and not the reality of life. The society and its institutions must have the capacity to tolerate genuine mistakes committed inadvertently during the course of Research and Development of innovative practices in Teacher Education.

4. Borrowed Research Methodology

We really believe in borrowed methodology than indigenious. Indian brain is highly evolved, Indian artists, scientists, scholars, technocrats, researchers, and industrialists, as well as businessmen all are quality service oriented in their core not only this Indians are capable developing their own research methods, There are pioneers and pioneers in India. But, the problem is of recognition and patenting. We are more used to the foreign molecules in most of the domains where as the India molecules wait for years together to be patented. We have more craze for the extraneous at the cost of indigenious. Our apex institutions are mad after the foreign products. The quality researches are those which follow a standard format and borrowed methods. True research is one, which helps and aids the local, grass root level problems and solves them with any method; own method.

There is no parallel to Indian heritage, ethos, values & culture. Let us Search & Re-Search and find our own selves & basic culture through our Pioneering Striving. Where are we lost? We ought to find our own selves.

5. Weak & Meek Qualitative Research Methodology

Qualitative research explores a problem and develops the detail understanding of a central phenomenon. It is best suited to address a research problem in which we do not know the variable and need to explore, the literature might yield little information about the phenomenon of study, and one should understand the reality from participants through exploring. Qualitative research cannot be conducted through a-priori samples only. Sampling goes on throughout research, through various sampling techniques, such as, typical case sampling, intensity sampling, critical case sampling, sensitive case sampling, convenience sampling, primary selection and secondary selection. Qualitative Research cannot be conducted through static tools and techniques, because very often the researcher employing qualitative research methodology does not have a sound theoretical base related to the reality. Theory in fact is the product of enquiry.

Qualitative research is affected by a wonderful interaction of subject and object. The object needs to be perceived as objectively and comprehensively as feasible. One of the basic tenets of qualitative research is awareness of one's own biases. There is a need to address diversity issues, such as, gender, race, religion, ability, sexual orientation, and socio-economic status. The pursuit of knowledge should be conducted with sincerity and care. We need a strong qualitative research designs and qualitative research studies.

6. Mechanization of Educational Research

Very often Essence of Educational Research is lost in its mechanics. Usually our concern is research methodology rigor than the implication of the emerging theses. A large majority of the Research Scholars use ready made tools, compatible or non-compatible. Functional analysis cutting across hundreds of doctoral viva-voce suggests that we have grossly failed to Philosophise in Education. Then what are the Ph.D. in Education degrees representatives of. Convocation without invocation are valueless. The painful scenario finds expression as follows:

- Merely the psycho-meters are super imposed on the natural reality; which in fact is very complex.

- Numbers are too meek to represent the social reality.
- How so ever developed, the Scales are too limited to be substance sensitive.
- Rarely the characteristics of the measuring tools are established.
- There is rare correspondence amongst Research Problem, Methodology and Emerging Theses.
- We create countless problems for the field while addressing a Research Problem, rarely the solution is arrived at.

7. Biased Research

Any Research should never and ever be biased. Research bias is making some alterations or changing the findings to satisfy certain predictions or interest groups. Scientific and Technological researches are objective in nature; hence the researcher bias would be less. But in social science research as they deal with human beings in the research and go subjectively, hence the influence of the researcher is possible to some extent. The Investigator should attempt for all the means to minimize the biasness.

8. Research – a Power Gimmic

How genuine is the financial support for research is a big question. The Scholars need to be very sensitive to that at times there are tendencies to capture and exploit their expertise for the vested gains. The present society seems to have become over humanistic & over pro-nature lending us money at our door steps, that too, through repeated and recursive calls. Earlier the state of the borrowers was miserable, but now, there is reversal. Every researcher should address a question to the self, that, whether my expertise is employed for creation, construction and universe development connection. At times a highly evolved brain can be highly devastating if the energy flow is not well channelized.

9. Lack of Research Synthesis & Trend Analysis

Research has been done in various areas, sub areas, on different dimensions, on different points of time. But A synthetic view of a research of particular main area is very important, a wholistic view is very important, but it is less seen in the research field. Research synthesis is the practice of systematically distilling and integrating data from a variety of sources in order to draw more reliable conclusions about a given question or topic. It is required in the

research for having a complete view of the given area and its research , growth and development.

Trend Analysis is Trend analysis means looking at how a potential driver of change has developed over time, and how it is likely to develop in the future. Rational analysis of development patterns provides a far more reliable basis for speculation and prediction than reliance on mere intuition. Several trends can be combined to picture a possible future for the sector of interest, such as schooling. Trend analysis does not predict what the future will look like; it becomes a powerful tool for strategic planning by creating plausible, detailed pictures of what the future might look like. In scenario development, trend analysis can be a powerful tool for developing robust content, content that can erase prejudices and open minds by exploring and combining far-reaching developments that might affect the environment and conditions in which education takes place.

10. Research Ethics

When one thinks of ethics, it comes to one's mind about morals and norms decided by the society in general. One gets the sense of morals from the childhood i. e from family, school and society and throughout life from different stages of life,

Research ethics is important to advance and elevate the aims of the research, accountability to the society and to build the public support for funding the research projects.

According to Shamoo and Resnik (2009), the ethics in research should be related to few categories namely,

Honesty: Strive for honesty in all scientific communications. Honestly report data, results, methods and procedures, and publication status. Do not fabricate, falsify, or misrepresent data. Do not deceive colleagues, granting agencies, or the public.

Objectivity: Strive to avoid bias in experimental design, data analysis, data interpretation, peer review, personnel decisions, grant writing, expert testimony, and other aspects of research where objectivity is expected or required. Avoid or minimize bias or self-deception. Disclose personal or financial interests that may affect research.

Integrity: Keep your promises and agreements; act with sincerity; strive for consistency of thought and action.

Carefulness: Avoid careless errors and negligence; carefully and critically examine your own work and the work of your peers. Keep good records of research activities, such as data collection, research design, and correspondence with agencies or journals.

Openness: Share data, results, ideas, tools, resources. Be open to criticism and new ideas.

Respect for Intellectual property: Honour patents, copyrights, and other forms of intellectual property. Do not use unpublished data, methods, or results without permission. Give credit where credit is due. Give proper acknowledgement or credit for all contributions to research. Never plagiarize

Confidentiality: Protect confidential communications, such as papers or grants submitted for publication, personnel records, trade or military secrets, and patient records.

Responsible Publication: Publish in order to advance research and scholarship, not to advance just your own career. Avoid wasteful and duplicative publication.

Responsible mentoring: Help to educate, mentor, and advise students. Promote their welfare and allow them to make their own decisions.

Respect for the colleagues: Respect your colleagues and treat them fairly.

Social Responsibility: Strive to promote social good and prevent or mitigate social harms through research, public education, and advocacy.

Competence: Maintain and improve your own professional competence and expertise through lifelong education and learning; take steps to promote competence in science as a whole.

Non-Discrimination: Avoid discrimination against colleagues or students on the basis of sex, race, ethnicity, or other factors that are not related to their scientific competence and integrity.

Legality: Know and obey relevant laws and institutional and governmental policies.

Animal Care: Show proper respect and care for animals when using them in research. Do not conduct unnecessary or poorly designed animal experiments.

Human care protection: When conducting research on human subjects, minimize harms and risks and maximize benefits; respect human dignity, privacy, and autonomy; take special precautions with vulnerable populations; and strive to distribute the benefits and burdens of research fairly.

Ethical Practices should be throughout the research process. In all the steps of the research process one needs engage in ethical practices. Practicing ethics is a complex matter that involves much more than merely following guidelines such as those from professional associations or conforming to guidelines from campus institutional review boards.

Ethics should become a more pervasive idea stretching from the origins of a research study to its final completion and distribution. Ethics should be a primary consideration rather than an afterthought, and it should be at the fore front of the research agenda.

Check your progress:

1. Which are the various methodological issues of Research in Teacher Education?

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2. Stereotyped Educational Research does not lead for the development. Explain

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3. Why Innovations in Research are suppressed?

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4. What do you mean by Research Synthesis and Trend Analysis? Discuss the importance.

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5. Which are the ethical issues of Educational research?

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NCTE: Structure & Functions

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Introduction

National Council of Teacher Education (NCTE) was set up in 1973 as an advisory body to advise Government of India, State Government and Universities regarding all matters concerning teacher education. In August 1995 it has become a statutory and independent body and has been given power of accreditation/non-accreditation of the colleges and the departments of education. It is now able to take policy decisions and a new curriculum frame work is expected soon to improve the existing courses and structures of B.Ed. and other courses of teacher education. The curriculum frame work (1988) accepted flexibility and integration as its base points. But this should not be taken as last word, as it is a continuous process of thinking, modifying and evaluating the whole phenomenon.

a. Establishment of the NCTE

The year 1973 was a landmark in the annals of teacher education in India when NCTE was established with the help of UGC, NCERT and ministry of Education. The NCTE opened a new era in teacher education and provided opportunities for the proper development of teacher education, since the quality of education depends on the ability and professional commitment of teachers. The first meeting of NCTE was held in Delhi on December 21, 1973 with Prof. Nurul Hasan as the chairperson. This council was set up in following groups with eminent teacher educators:

1. A working group to report on the present status of teacher educators in the country.

2. Standing committee on elementary teacher education, secondary education, higher education and pre-school teacher education.
3. Technical, vocational and work experience education.
4. In-service education.
5. Standard in teacher education.
6. Steering committee to coordinate the work of all standing committee and to highlight the problems which need the attention of NCTE.

b. Changing Norms & Regulations of the NCTE

Although NCTE was established, and a frame work of teacher education curriculum (1978) was also given but it was not able to guide the system of teacher education to meet the emerging challenges. Some of the difficulties were inherent in its constitution. The working group considered at length various aspects of teacher education relating to its modernisation and revitalisation, particularly with reference to implications of the new school curriculum, educational values, education of the handicapped, educational technologies and computer education with minimum norms for the staff. Some salient recommendations were:

1. Physical facilities and methods of organising the academic programmes in each teacher training institution are to be provided.
2. Additional financial inputs to fifty selected teacher training institutions with higher level courses for pre-service and in-service trainees made available through central assistance in order to enable them to offer courses of study in the areas like special education, educational technology and computer education with full facilities for practical training in the institutions.
3. A national accrediting agency for teacher education with statutory powers to be established to control the standards of teacher education.
4. The teacher education course to be accomplished with a period of internship.

5. The numbers of teachers to be trained should be fixed by the state government on the basis of actual recruitment subject-wise and level-wise for the state.
6. Admission to teacher training institution in a state should be made on the basis of the entrance test given by a state level agency.
7. The pace-setting teacher education institutions may be developed, as comprehensive colleges of education to provide teacher education at all levels, namely, pre-school, elementary, secondary and higher education: in the due courses these may be further developed as autonomous colleges of education.
8. Every teacher is to be oriented in educational values theoretically by a course on teacher and education in the Emerging Indian Society and practically by organising suitable activities in the teacher education programme.
9. All organised educational institutions will be expected to employ teachers holding degrees which are accredited by the NCTE or by the universities which will offer teacher education courses in conformity with the guidelines provided by NCTE.
10. Relevance of the curriculum to the personal and social needs of children, school and also relevant to Indian conditions.
11. Interdisciplinary and integrated approaches to teacher education.
12. Teacher education to be task-oriented and performance based.
13. Provisions and scope for further experiments, innovations and research for the development of teacher education.

This highlighted the importance of evolving traditional and non-traditional methodologies for the training of teachers. The teacher education curriculum was reframed in, 1988, in the light of new education policy but if the teacher has to perform a key role as the change agent, there is a need to orient the existing educational administration. The organisation pattern initiated by NCERT and NIEPA to drive maximum benefit in terms of the effectiveness from limited source has set up an infrastructure but

many other tasks cannot be perform in a state of disorder. Education needs to be managed in an atmosphere of utmost intellectual rigour, seriousness of purpose and freedom essential for innovation and creativity. The process of discipline, decentralisation, participation, functional autonomy, accountability, and vision of the future are of utmost importance.

After much discussions, meetings and decisions, in 1995 NCTE was conferred a statutory status with autonomy and accreditation powers. This placed a high expectation and demand on NCTE. The new council consists of the following members:

- 1) One chairman
- 2) One vice-chairman
- 3) One member –secretary
- 4) Secretary from central government Ex-officio
- 5) Chairman UGC Ex-officio
- 6) Director NCERT
- 7) Director NIEPA
- 8) The adviser (Education), Planning Commission Ex-officio
- 9) Chairman, CBSE Ex-officio
- 10) Financial adviser to government of India (Education) Ex-officio
- 11) Member Secretary – AICTE Ex-officio
- 12) Chairpersons of all Regional Committees Ex-officio
- 13) Thirteen persons from
 - i. Deans of education faculties and professors of education from universities (1);
 - ii. Experts in Secondary teacher education (1);
 - iii. Experts in pre-primary and primary teacher education (1);
 - iv. Experts in non formal education and adult education (1);
 - v. Experts in the field of natural sciences, social sciences, linguistics, vocational education, work experience, educational technology, and special education (9) by rotation.

- 14) Nine members from state and UTs
- 15) Three members from the parliament
- 16) Three members from primary, secondary and recognised institutions.

After NCTE started functioning as a statutory body in 1995, the various aspects of pre-service and in-service teacher education programmes were examined and following recommendations were made:

1. Pre-service teacher education for the first degree/diploma should be undertaken only through face-to-face institutional courses of teacher education of a minimum of one academic year duration.
2. No further admission should be made to courses of teacher education other than regular face-to-face programme of one academic year duration from the academic session 1995-96 onwards.
3. NCTE may consider part time face-to-face institutionalized programmes of teacher education only if the programmes are equivalent to face-to-face full time institutional programmes in their total duration of instruction including practical teaching and their practical work with required academic staff and infrastructure as per NCTE norms.
4. Correspondence/distance education mode can be used effectively for in-service education of teachers at all levels who have already obtained their first degree/diploma in teacher education.
5. A teacher education programme institution will be considered to be indulging in commercialisation if the recurring expenditure of that year/programme by more than 10 percent.

Function of the Council

The council will take all the steps to ensure planned and coordinated development of teacher education for the determination and maintenance of standards for teacher education. Therefore, the council may;

- 1) Undertake surveys and studies relating to various aspects of teacher education and publish the results there of;
- 2) Make recommendations to the central and state governments, universities, UGC and recognised institutions in the matter of preparing suitable plants and programmes in the field of teacher education.
- 3) Coordinate and monitor teacher education and its development in the country.
- 4) Lay down guidelines in respect of minimum qualifications for a person to be employed as a teacher in schools or in recognised institutions.
- 5) Lay down norms for any specified category of courses or trainings in teacher education, including the minimum eligibility criteria for admission thereof, and the method of selection of candidates, duration of the course, course contents and mode of curriculum.
- 6) Lay down guidelines for compliance by recognised institutions, for starting new courses or training, and for providing physical and instructional facilities, staffing pattern and staff qualifications.
- 7) Lay down standards in respect of examinations leading to teacher education qualification criteria for admission to such examinations and schemes of courses or training.
- 8) Lay down guidelines regarding tuition fees and other fees chargeable by recognised institutions.
- 9) Promote and conduct innovation and research in various areas of teacher education and disseminate the results there of.
- 10) Examine and review periodically the implementation of the norms, guidelines and standards laid down by the council and to suitably advise the recognised institutions.
- 11) Evolve suitable performance appraisal systems, norms and mechanisms for enforcing accountability on recognised institutions.

- 12) Formulate schemes for various level of teacher education and identify recognised institutions and set up new institutions for teacher development programmes.
- 13) Take all necessary steps to prevent commercialisation of teacher education.
- 14) Perform such other functions as may be entrusted to it by the central government, and
- 15) Conduct inspection to ascertain the functioning of the institutions and communicate the views there of.

c. Stage Specific & Area Specific Teacher Education

If the council, on recommendations of the institution for offering a course or trainings, feels satisfied that such institution has adequate financial resources, accommodation, library, qualified staff, laboratory and that it fulfil such other condition required for proper functioning of the institution for a course or training in teacher education, as may be determined by regulations, may pass an order granting recognition to such institution, subject to such conditions as may be determined by regulations. The examining body will grant an affiliation to the institution, where recognition has been granted. The recognised institution if intends to start any new course or training in teacher education it may make an application for permission to regional committee. "Teacher Education", as defined by NCTE, means programmes of education, research or training of persons for equipping them to teach at pre-primary, primary, secondary and senior secondary stages in schools and includes non-formal education, part time education, adult education and correspondence education.

As part of its responsibility, NCTE has developed norms for teacher education programmes at elementary, pre-primary, and secondary stages. These norms are milestones in ensuring qualitative improvement

of teacher education. Various aspects on which qualitative improvement have already started taking shape are as follows:

Essential Qualifications of Teacher Educators

There are many variations in essential qualifications of teacher educators working in teacher training institutions. At secondary stage, some systems insist on a Post graduate degree in addition to M.Ed./M.A. (Education). Some systems do not accept M.A. (Education) as equivalent to M.Ed. In other systems, one need only be a M.Ed./M.A. (Education). In some systems one need not be M.Ed./M.A. (Education). A.P.G. with B.Ed. can suffice. In such a situation NCTE specification of M.Ed. and Master's Degree in a school/subject might help increase the standard of teacher educators. The essential qualifications have been fixed as M.Ed./M.A. (Education) and a Master's Degree in relevant school subject. This sort of increase in qualification shall create many vacancies for M.Ed./M.A. (Education) degree holders in many states where trained graduates function as even principals of District Institutes of Education and Training.

Training in Physical Education

Training in physical education is an essential component of teacher training. In a large number of teacher training institutions, practical training in physical education does not take place. Physical education theory is taught by lecturers in education/teacher educators. The Institutions of Advanced Study in Education (IASEs), College of Teacher Education (CTEs), District Institutes of Education and Training (DIETs) and Regional Institutes of Education of NCERT have posts of lecturers/instructors in physical education. But such posts do not exist in majority of teacher training institutions. NCTE norms stipulate posting of a full time/part time teacher educators of rank of TGT/PGT for pre-primary, rank of PGT for elementary and rank of lecturer for secondary stages of teacher education.

Training in Art and Music

Training in art and music is essential for every teacher training programme. Unfortunately, teacher education institutions have been neglecting this important aspect of training in aesthetic development. Barring pre-primary teacher training institutions facilities for having posts of teacher educators for imparting training in art/music do not exist in most of the teacher training institutions. As part of Central Government scheme of upgrading quality of teacher education, posts of instructors have been created in IASEs, CTEs and DIETs. Provision of such posts in NCTE norms shall necessitate provision for art and music training as part of regular course work. Part time/full time staff members shall have to be posted for this purpose. With introduction of this component, teacher training shall be more lively and this lead to more lively atmosphere in school situations.

Qualitative Improvement in Curriculum

Teacher training institutions of different stages varies much in details of curriculum transaction. Prescription of certain essential standards by NCTE shall lead to improvement in quality of the teacher training programmes that lag behind the desired pattern. For instance, in certain systems, a B.Ed. candidate has to produce as many as 40 teaching aids as part of course work, whereas in other systems, a B.Ed. candidate may not produce any teaching aid. In certain systems, observation of classes of peers/school teachers is essential. Whereas in other systems such provision do not exist. In certain systems, demonstration lesson are given in simulated situation, whereas, in other systems, demonstration lessons are given in real classrooms. NCTE norms shall try to ensure adherence to at least basic requirements.

Norms for essential Practical Work for Various stages of education are as follows:

Aspects	Secondary	Elementary	Pre-primary
Observation of demonstration lessons in each subject	5	10 in each	2
Observation of lesson taught by good teachers in each method subject	10	15 in each subject (including that of trainees)	N.S.
Case study/ action research/ other project	1	1	N.S.
Construction of test items unit test and examination question paper	20 + 1 + 1 (group work in each method subject)	N.S.	N.S.
Preparation of unit and resource plan	2 (group work)	N.S.	N.S.
Preparation of lesson plans (apart from preparatory training lessons)	10	-	N.S.
Administration of psychological tests, scoring and administration	5	3	N.S.
Preparation of teaching aids	20	5	30 (including activity materials)
Science experiments relevant	10	10	-
Participation in games &	N.S.	½ hours a	N.S.

Sports		day	
Supervised practice teaching Days	40	40	30
Number of lessons to be taught per day during practice teaching	2	2	2
Number of lessons to be taught	20 in each method subject	15 in each subject	45 (10 lessons in each of the subject areas and 2 to 4 sessions on other areas)
Numbers of students to be deputed per section during practice teaching	2	2	2
Manner of supervision of Lessons	N.A.	Full	N.S.

N.S. stands for not specified.

Specification of funds for Curricular Programmes

Many teacher education institutions do not get adequate funds to carry out curricular programmes. This is also true for government teacher education institutions. It is a fact that government institutions in a State did not get funds for buying chalks, dusters etc. for a period of 10 months. In such a situation, NCTE specification of financial pattern for various curricular programmes may necessitate early and timely provision of funds, as lack of such provision may lead to de-recognition. The specifications made in the NCTE norms are as follows:

Aspects	Essential Amount Per Student		
	Secondary	Elementary	Pre-primary
Science Activities	50	50	50
Psychology & Education	50	50	50
Education Technology	100	-	-
Workshop & Experience	100	50	150
Art & Music	50	-	-
Games & Sports	50	50	50
Books & Journals	150	50	-
Contingencies	50	50	10
	600	300	300

Certain systems provide for collection of fees from students. Above specification of financial provision for certain specific aspects of curricular programmes may necessitate streamlining of collections made from teacher trainees. The states which do not have adequate funds for teacher training programmes may consider the possibility of charging of tuition fees and other fees, if not being already collected.

The academic programmes

For in-service education of teachers NCTE organises workshops, seminars, conferences, study groups etc. in various regions of the country. It conducts orientation programmes in micro-teaching and core teaching skills etc. and prepare textual materials. Besides it has to take keen interest and steps in initiating following activities:

- 1) Proposal of closing down of B.Ed. correspondence courses for quality control. The standing committee on NCTE on college and secondary teacher education held that B.Ed. correspondence course should be closed down as pre-service training for

inexperienced fresh candidates. It has allowed for in-service teachers with minimum two years experience.

- 2) Code of professional Ethics: in pursuance of the NPE 1986, a draft code of professional ethics for teachers was developed in a workshop in consultation with DPIs, Directors of SCERTs/SIEs, SBTEs and NCERT.
- 3) Teacher education, curriculum needs periodic reviews and revisions in the light of the experience of implementation, new trends and developments at all levels, for qualitative improvement of school education.
- 4) Teachers' accountability, social and professional responsibilities etc. aiming at refining the tools developed earlier to measure accountability and the social and professional responsibilities of teachers.

Future Programmes undertaken would be:

- A. Teacher education curriculum at all levels a face lift with modern technological bases and in the light of needs and preparations to enter next century successfully in close cooperation with Deans of education faculties, state departments of education.
- B. Four year teacher education curriculum to be revised and improved.
- C. Special teacher preparation for +2 stage teachers of academic and vocational streams.
- D. Some new emphases on pre-school and elementary teacher education so that the objective of universal elementary education can be achieved according to the set target.
- E. Development of integrated information system and data based teacher education.
- F. Recruitment of teachers-criteria for selection.
- G. Selection of candidates for admission to teacher training courses at various levels.

- H. Regular publication of NCTE bulletin to disseminate new innovations
- I. Revision of teacher education courses in all institutions in the light of prepared new curriculum frame work so that new ideas are successfully implemented.

Infect, education has and should continue to evolve, diversify and extend its reach and coverage. Every country develops and would have to develop such system of teacher education which can promote the education of the country to meet challenges of all times to come. Thus the teacher has to be competent and professionalised to meet two broad roles of serving and constructing the humanity.

d. Need to Strengthen the NCTE

In the speech of Shri Kapil Sibal Union Minister for Human Resource Development for the 15th Foundation Day Function of the NCTE, he opined, "there is need to strengthen NCTE because our nation requires good quality teachers. To ensure quality equivalence in teacher education on a national scale is not an easy task. The NCTE would strive hard to take all necessary steps to further improve its regulatory mechanisms to ensure the planned and coordinated development of teacher education. We need good teachers to light the flame of a child's creative expression. We need the magic of teachers to inspire our children to discover their own genius."

NCTE should be strengthening by using its statutory authority to undertake the following initiatives without delay lest the situation becomes more complex to handle:-

- NCTE should initiate for professionalizing teacher education in terms of new innovative content and pedagogical practices.
- NCTE should undertake a more scientific review of norms and standards for each course of teacher education for different stages of education.
- NCTE needs to evolve effective mechanisms to monitor the process of teacher education being followed in different institutions offering

teacher education programmes. The paradigm shift from product to process indicators is long overdue.

- Enhancement of the participation of the universities as active partners of NCTE in giving a qualitative orientation to teacher education.
- Facilitate experimentation with multiple models of teacher education and encourage universities to take a leading role in improving the quality of teacher education in all its dimensions in the institutions affiliated to them.
- Focus on the use of Information and Communication Technology (ICT) as an intervention for new pedagogies for teaching and learning.
- Efficient structures for ensuring continuing professional development of teachers and teacher educators.
- Activate Government institutions like the Institutes of Advance Studies in Education (IASSEs) visualized in the Centrally Sponsored Scheme for strengthening and reorganization of teacher education to perform a more pro-active role.

e. Need to evolve a congruent model of Teacher Education cutting across levels:

There is a need to evolve a congruent model of Teacher Education cutting across all the Education Levels, namely, Pre-Primary, Primary, Secondary, Higher Secondary, Higher and Continuing Education. It presumes the basic premise that the Teacher Education across levels has many a commonalities. Level specific unique requirements may be met separately.

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ICT Aided Constructivist Learning Approach for the Professional Development of Pre-Service Teachers

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ABSTRACT

Technology has revolutionized all domains of the society; it has penetrated into every aspect of the social and cultural lives. Education is not an exception but teaching and other educational endeavours have not taken full advantage of these changes. The schools have remained in the past, while our children are much ahead. In the Science classroom teachers present the knowledge to children in a linear, didactic manner that differs significantly from the children's previous experience outside the school which results into mismatch between the learner and the society. Previous experiences of the learners play vital role in learning new things, here comes the application of Constructivist philosophy. It has become the latest catchword in educational circle which is applied to both learning theory and epistemology. It is basically a learner centred approach. ICT can transform the learning environment into one that is learner centred. It encourages active and collaborative learning. Only ICT implementation into education cannot do miracles. ICT should be integrated with certain learning theories. The present situation needs a paradigm shift and willing abandonment of familiar perspectives and practices and the absorption of new ones like constructivism. It demands the role of teacher as a facilitator who encourages learners to reflect, analyze, design and develop the process of knowledge construction. Teachers who are not familiar with the constructivist approach may first require a change in the educational philosophy. So it is important that the teachers' role has to be revitalized. Hence the teacher education system also has to include the culture of germination of new ideas, incubation, innovation, creation and construction. Teacher Education and School Education have a symbiotic relationship. If the school teachers are expected to bring about a revolution in their approaches to teaching, the same revolution must find a place in the Colleges of Education. The present study focuses on professional development of the pre-service teachers through ICT aided Constructivist Approach by designing, developing and implementing an ICT Aided Constructivist Learning Approach in Science for Pre-Service Teachers.

Introduction

Technology has revolutionized our present society. In the last two decades Technology has dramatically reacted into every aspect of social and cultural lives. But at the same time Teaching and other Educational Endeavours have not taken full advantage of these changes. The schools have remained in the past, while our children are much ahead. In the Science classroom teachers present the knowledge to children in a linear, didactic manner that differs dramatically from the children's previous experience outside the School. The result is the mismatch between the learner and the society. But it is not the children who are mismatch to the schools; rather the schools are mismatch to the children. This divergence between our children and our educational practices needs a drastic educational reform that will bring the classroom into line with society, only by renewing educational practices; we can close this gap and reunite our schools with our children and rest of the society. Teacher must know the most current research practice which can be used effectively to match particular teaching procedures. Such goals are not easy to achieve. It requires re-organization of the Pre-Service and In-Service teacher education programs as well as the school system keeping in view the new pedagogy and challenges of globalization. To accomplish this goal requires both a change in the traditional views of learning process and an understanding of how the technology can create new learning environment. In which students are engaged learners, able to take greater responsibility for their own learning and construct their own knowledge through the constructivist learning approach. To achieve this, there is an urgent need of introducing Technology Aided Constructivist learning environment for the professional development of teachers.

Constructivism suggests that the learner's understandings of the way the worlds' work is the result of one's own active construction rather than someone else's presentation. Constructivist believes that knowledge is the result of individual constructions of reality (Brooks, 1990). Constructivism is meaning making activity and produce active learners and creative thinkers. But now there is a widespread concern that the educational experiences provided in many schools are not preparing students well for the future. It is believed that creating a paradigm shift in view of learning process, coupled with the application of technology may play an important role in bringing educational systems into alignment with the emerging knowledge based information rich and technologically advanced society. ICT offers wide array for building new schooling systems that allows long distance exchange and interaction between geographically spread groups of teachers and their students meeting this

challenge, in turn requires collaboration across national, cultural, and institutional boundaries, and among groups and individuals who have been isolated. Electronic mail, bulletin board systems, teleconferences and virtual communities of World Wide Web allow reciprocal communication among individuals and groups with common interests. Our aim of educators must go beyond specialized training of craftsmen and factory workers. The only true education is one where all arts, crafts, sciences, technologies are linked and facilitate mutual cognitive development, productive creativity and personal growth. So at the time we need teachers who are masters not only in technology but also in content, pedagogy and above all they should be humane. Only technology and content cannot replace a teacher, the teachers must be well versed in child psychology, should have a capability to understand the children mental, physical, psychological situation and then apply technologies with the content and pedagogy.

ICT Aided Constructivist Learning Approach (ICTACLA) for Pre- Service Teachers

According to NCTE framework (1998), Teacher Education is a professional programme aiming at the development of teacher as a person and agent of social change. The professional preparation of students who want to enter the profession of teaching, teacher education prepares them, for attaining the national goals of education for all, to preserve the continuity of traditions, to fulfil the actual needs of contemporary society, to meet the challenges of the uncertain future through education. Pre-Service Teacher Education develops better understanding of children, builds the confidence, makes them familiar about methodology of teaching with new techniques, builds positive attitude towards the teaching profession, familiarizes with latest knowledge of the profession, and develops attitudes towards research and experimentation. According to National Curriculum Framework (2005), reorienting the curriculum must be among our highest priorities, informing the information of teachers, the annual plans of schools, the design of textbooks, learning materials and evaluation patterns. The Yashpal Committee Report (1993), Learning Without Burden, noted: “The emphasis in these programmes should be on the enabling trainees to acquire the ability for self-learning and independent thinking”. Teacher education must become more sensitive to the emerging demands from the school system, for this it must prepare the teacher for the roles of being an: encouraging, supportive and humane facilitator in teaching-learning situations to enable learners to discover their talents, realize their physical and intellectual potentialities to the fullest and to develop character and desirable social and human values to function as

responsible citizens and active member of a group of persons who makes a conscious effect for curricular renewal so that it is relevant to changing societal needs and the personal needs of learners. Teachers need to be prepared to view learning as a search for meaning out of personal experience and knowledge generation as a continuously evolving process of reflective learning, view knowledge not as an external reality embedded in textbooks, but as constructed in shared context of teaching-learning and personal experience, appreciate the potential of productive work and hands-on experience as pedagogic medium both inside and outside the classroom.

A well developed professional development program is essential to reach the goal of preparing teachers for effective teaching. Professional development should enable the teachers to construct professional knowledge about pedagogy, content and technology, as well as, strategies for managing the classroom involvements brought about by the creation of constructivist learning environment supported by technology. To achieve this, teachers should be given appropriate learning experiences. These experiences should be situated in an authentic context for teachers in their school and classroom. It should build on their prior knowledge and provide opportunities for social interaction with colleagues. It should begin with investigation of problems supported by technology that are relevant to teachers. Such learning experiences enable the teachers to create learning environment appropriate for children of the information age. ICT involved education helps the Pre-Service and In-Service teachers to become capable to the present competitive classrooms.

It is not easy to adopt ICT aided Constructivist Learning approach directly, for this teacher has to be prepared enough. In the constructivist classroom the responsibility of the teachers will be more. Teachers should be well versed in the knowledge and principles of constructivist approach. Here the knowledge is actively built, so teachers should provide the suitable learning environment like engaging students in learning, encourage group interactions. Teachers should nurture students' natural curiosity through frequent use of ICT, and provide the knowledge of ICT in various forms. So to achieve all these teachers must know the constructivist approach and ICT in order to teach to their students. In order to achieve this teachers have to be trained well before, they need professional development programs regarding ICT and Constructivist approach. According to NCERT (2000) in Pre-Service Teacher Education there is a need to introduce use of media and technology-enabled methods of learning, making it inherent and embedded in the teaching-learning process of teachers, and to enable the pre-service teachers to access sources of knowledge and to create

knowledge. It needs a paradigm shift and willing abandonment of familiar perspectives and practices and the absorption of new ones (Brookes, 1993). Teachers who are not familiar with the constructivist approach using ICT as tools may first require a change in the educational philosophy (Healy, 1998).

A disconnect has been observed that the teacher education and school education are not linked in terms of research and practice. So there is dire need that researches should be done in teacher education and whose implications could be studied at school level, which may bridge the gap found. And the process of integration of ICT aided Constructivism should evolve from the teacher education programmes itself. If the revolution is expected in schools, it should start from the Colleges of Education. There is a need to equip teachers with competencies to use ICT for their own professional development (NCF, 2009). To achieve this there is an urgent need of introducing ICT Aided Constructivist Learning Environment for the professional development of Pre-Service Teachers. All these ideas have contributed for the genesis of the present study. So in the present study the importance of teacher's preparation and support for the successful implementation of Constructivist approach using ICT as tools for the teaching is emphasized.

Present Study

Development and Implementation of ICT Aided Constructivist Learning Approach for the Professional Development of Pre-Service Teachers

Objectives of the Study

1. To develop ICT Aided Constructivist Learning Approach in Science for the Pre-Service Teachers.
2. To study the effectiveness of ICT Aided Constructivist learning Approach in Science in terms of
 - i. Reactions of Pre-Service Teachers.
 - ii. Reactions of School Students.
 - iii. Reactions of Teacher Educators.
 - iv. Academic achievement of School Students.
 - v. Observations by the Investigator, Pre-Service Teachers and Teacher Educators.
 - vi. Reflections of Pre-Service teachers.
 - vii. The emerging status of the ICTACLA.
3. To study the level of professional development of Pre-Service teachers through ICT Aided Constructivist Learning Approach.

Hypotheses

1. There will be no significant difference between observed frequencies and expected frequencies against equal probability on various statements of Reaction Scale for Pre-Service Teachers.
2. There will be no significant difference between observed frequencies and expected frequencies against equal probability on various statements of Reaction Scale for School Students.
3. There will be no significant difference between pre-test mean and post –test mean scores from single of the School Students.
4. There will be no significant difference between the observed frequencies and frequencies expected against equal probability on various elements of Observation Schedule.
5. There will be no significant difference in the observations of practice teaching lessons by the Researchers, Pre-Service Teachers and Teacher Educators.
6. There will be no significant difference in the Pre-Intervention observed frequency distribution and Post-Intervention observed frequency distribution against the Five class Intervals for Experimental group of Pre-Service Teachers As Learners.
7. There will be no significant difference in the Pre-Intervention observed frequency distribution and Post-Intervention observed frequency distribution against the Five class Intervals for Experimental group of Pre-Service Teachers As Teachers.
8. There will be no significant difference in the Pre-Intervention observed frequency distribution and Post-Intervention observed frequency distribution against the Five class Intervals for Experimental group of Pre-Service Teachers both As Learners and As Teachers.
9. There will be no significant difference in the Pre-Intervention observed frequency distribution and Post-Intervention observed frequency distribution against the Five class Intervals for Control group of Pre-Service Teachers As Learners.
10. There will be no significant difference in the Pre-Intervention observed frequency distribution and Post-Intervention observed frequency distribution against the Five class Intervals for Control group of Pre-Service Teachers As Teachers.
11. There will be no significant difference in the Pre-Intervention observed frequency distribution and Post-Intervention observed frequency distribution against the Five class Intervals for Control group of Pre-Service Teachers both As Learners and As Teachers.

12. There will be no significant difference in the Pre-Intervention observed frequency distribution against the Five class Intervals for Experimental and Control group of Pre-Service Teachers As Learners.
13. There will be no significant difference in the Pre-Intervention observed frequency distribution against the Five class Intervals for Experimental and Control group of Pre-Service Teachers As Teachers.
14. There will be no significant difference in the Pre-Intervention observed frequency distribution against the Five class Intervals for Experimental and Control group of Pre-Service Teachers both As Learners and Teachers.
15. There will be no significant difference in the Post-Intervention observed frequency distribution against the Five class Intervals for Experimental and Control group of Pre-Service Teachers As Learners.
16. There will be no significant difference in the Post-Intervention observed frequency distribution against the Five class Intervals for Experimental and Control group of Pre-Service Teachers As Teachers.
17. There will be no significant difference in the Post-Intervention observed frequency distribution against the Five class Intervals for Experimental and Control group of Pre-Service Teachers both As Learners and Teachers.

Operational Definition of the terms

Information and Communication Technology

Information and Communication Technologies in the present study includes MS Office, Internet Surfing, Creation and Sharing of Blogs, Wiki-Space, Wiki-Education, Wikipedia, Social Network Services, Hyper Linking, Navigating, Use of Educational Softwares. And use of all these for the process of Development and Implementation of the Intervention Programme.

ICT Aided Constructivist Learning Approach

ICT Aided Constructivist Learning Approach in the present study refers to the Programme developed by the Researcher by using Constructivist Learning Principles with the help of ICT. The Programme is inclusive of concepts of ICT, Constructivism, and Integration of ICT Aided Constructivist learning approach for the professional development of Pre-Service Teachers and model Science Lesson designs employing ICTACLA.

Professional Development of Pre-Service Teachers

The Professional Development of Pre-Service Teachers in the present study includes the development of knowledge, understanding, skills and applications on ICT Aided Constructivist Learning Environment at College of Education level and School level. It has been studied through orientation programme; Designing and practicing the lessons employed ICTACLA at the college level and implementing them at the school level by the Pre-Service Teachers, Questionnaires, Reaction of School Students, Pre-Service Teachers and Teacher Educators, Achievement of School Students, through observations, Focused Group Discussions and Semi-Structured Interview.

Delimitations of the Study

The study was delimited to Science Pre-Service Teachers of Secondary level.

Design of the Study

Experimental Design

For the Pre-Service Teachers Experimental Control group Pre-Test and Post-Test Quasi-Experimental Design has been employed, whereas, for Schools Students Single group Pre-Test Post-Test Pre-Experimental Design has been employed.

Population for the Study

In the present study, the population is constituted of all the Science Method Secondary Pre-Service Teachers of Karnataka State (2011-2012), and all the Secondary School Students of IX Std. of Karnataka State (2011-2012).

Sample for the Study

1. Sample includes all the 35 Science Method Pre-Service Teachers of University College of Education Dharwad, as the Experimental Group, whereas, that of 30 Science Method Pre-Service Teachers of Dr. Kamala Baliga College of Education, Kumta, as the Control Group of the academic year 2011-2012.
2. All the IX Std. students of two practicing divisions from each school of all six practicing schools of University College of Education were considered as student sample. 437 school students constituted the sample.
3. The Colleges of Education were selected purposively, whereas, the Pre-Service Teachers and the School Students were selected through cluster sampling.

Tools and Techniques

The Tools, namely Questionnaire, Reaction Scales, Observation Schedule, Semi-Structured Interview Schedule were constructed by the Researcher and validated by the Experts. Field Notes were taken by the Researcher. Pre-Service Teachers' Observed Daily Diary and Conducted Focused Group Discussion with the Pre-Service Teachers.

Questionnaire

The Researcher constructed a Questionnaire by following the principles and characteristics of Constructivist Learning Approach and Integration of ICT and The development of questionnaire followed the five point Likert Scale - Very Often, Often, Sometimes, Seldom and Never. The questionnaire contains the two forms, namely, As Teachers perceived form and As Learner perceived form. The questionnaire was used to collect the data related to the Pre and Post intervention professional status of Pre-Service Teachers. The content validity was established by the experts and the Researchers found the reliability by test and retest method

Reaction Scales

Reaction Scales were constructed by the Researcher to study the reactions of School Students, Pre-Service Teachers and Teacher Educators towards ICTACLA. Reaction Scale for School Students contains 27 items, for Pre-Service Teachers 42 items, whereas, as for Teacher Educators 16 items. All these are on 3 Point Scale - Always, Sometime and Never.

Observation Schedule

An Observation Schedule was constructed by the researcher to observe the implementation of lessons designed by Pre-Service Teachers through ICTACLA during practice teaching. The observation schedule contains the elements to be observed, namely like classroom environment, teacher behaviour, Learner participation and interaction behaviours in the practice teaching classes.

Achievement Tests

The tests constructed by the Pre-Service Teachers to study the Academic Achievement of School Students, both, Pre and Post intervention in the practice teaching, wherein, they conducted the classes by employing ICTACLA.

Semi-Structured Interview Schedule

Semi-Structured Interview Schedule was developed by the Researcher to interview the Pre-Service Teachers on ICTACLA. It contained the aspects, namely, Opinion of the Pre-Service

Teachers regarding ICT Aided Constructivist Learning Approach, Utility of ICTACLA in Science, Feeling during the preparation of the lessons employing of ICTACLA for Practice Teaching, Experiences during practice teaching using ICTACLA in the schools, Role of Pre-Service Teachers in the ICTACLA in future teaching Profession, Organization of Instructional Environment employing Constructivist Learning Approach, Problems faced during lesson preparation employing ICTACLA, Problems faced during practice teaching employing ICTACLA, Opinion regarding the effectiveness of ICTACLA and Suggestions on the orientation programme employing ICTACLA in Science.

Focused Group Discussions (FGD)

The Researcher conducted Focused group discussion with Pre-Service Teachers to collect their reflections on ICTACLA. The initial reflections of the Pre-Service Teachers on ICTACLA have probed them to discuss various aspects further namely, feel of ICTACLA, ICTACLA facilitating Science, lesson designing employing ICTACLA, experiences during practice teaching while employing ICTACLA, exploring the Possible Role of Pre-Service Teachers in the context of ICTACLA in their Profession, Designing Constructivist Learning Approach Environment, problems faced during Practice Teaching with ICTACLA, Effectiveness of ICTACLA in Science, Suggestions of the Pre-Service Teachers on ICTACLA in Science.

Pre-Service Teacher's Diary

The Researcher provided each Pre-Service Teacher a note-book to mention the daily activities on ICACLA throughout the programme, their views on the orientation programme, and suggestions for further improvement. These diaries were collected by the researcher at the end of the program.

Researcher's Diary for Field Note

The Researcher maintained the diary from the first day to the last day of data collection, wherein the notes were taken during orientation in the College of Education, during practice teaching and after practice teaching.

Rubric

Rubric was constructed and used by the Researcher to assess the lesson plans of Pre-Service Teachers which are designed based on the ICTACLA. The constructed Rubric contains 12 Categories. The lessons were assessed on 4 point scale namely, Excellent, Very Good, Satisfactory and Needs Improvement.

Development of the Program on Information and Communication Technology Aided Constructivist Learning Approach (ICTACLA)

The researcher has developed a Program for orientation of the Pre-Service Teachers on ICTACLA. Developments of the Program in terms of Introductory Manual where in various modules have designed and developed are:

Module I: Information and Communication Technology (ICT)

Module II: Constructivist Learning Approach

Module III: ICT Aided Constructivist Learning Approach

The Introductory module has been developed and its content validated by experts in the field. This has been used as a resource by the researcher during the orientation programme delivered to Science Pre-Service Teachers.

Collection of the Data

The data were collected through the following phases:

Phase 1

In the first phase the researcher studied the entry professional level of Science Pre-Service Teachers on ICTACLA through the Questionnaire. The researcher conducted the same test on the control group, but the control group was not orientated on ICTACLA.

Phase 2

The Researcher oriented all the Pre-Service Teachers towards ICT and basics of ICT skills by providing examples, activities and discussions. The concept of Constructivism was made clear through activities, demonstrations and discussions and followed by group activities and presentations. The Researcher oriented the Pre-Service Teachers on the ICT Aided Constructivist Learning Approach in Science. Here in this phase the researcher demonstrated the Model Lesson Plans from the Introductory Manual.

Phase 3

Lesson plans were designed by the Pre-Service Teachers by employing ICTACLA. These were corrected by the researcher; Pre-Service Teachers presented and practiced the lessons in class and collected feedback. Also the researcher oriented them on the observation of lessons conducted through ICT Aided Constructivist Approach during the practice teaching.

Phase 4

Pre-Service Teachers designed the lessons through the ICT Aided Constructivist Approach as per the orientation for the Practice Teaching by the researcher. Along with designing the lesson plans, Pre-Service Teachers developed their own different teaching aids; they referred various online resources for developing the teaching models and teaching aids.

Phase 5

Pre-Service Teachers conducted Pre-Test for school students and implemented the lessons with ICT Aided Constructivist Approach in their practice teaching. Here Pre-Service Teachers conducted the classes by creating constructivist environment, where in the classes were active and lively, made groups among the students during discussion, performed experiments with the help of students. The Teacher Educators, other Science Pre-Service Teachers observed the implementation of lessons. The researcher also observed the implementation of the lessons as a participant observer and noted the important points of the implementation process and classroom activities. Photos and Videos of experiments and some discussions were taken. Pre-Service Teachers conducted Post-Test in terms of achievement test at the end of the lessons.

Phase 6

The Researcher collected the Reactions of School Students towards the ICTACLA. In each of the school the Researcher collected reactions from the students of those classes where Pre-Service Teachers conducted the classes based on ICTACLA.

Phase 7

The Researcher studied the Effectiveness of these lessons through Academic Achievement of school students in the Post-Test conducted by Pre-Service Teachers.

Phase 8

The Orientation was continued after practice teaching because Pre-Service Teachers needed to deliver innovative lessons which were one month after practice teaching. All the Science Pre-Service Teachers liked to deliver their lessons on ICTACLA. So they demanded some more discussion on this. Accordingly they practiced some more lessons employing ICTACLA and presented their lessons. The researcher observed and noted all the practices as a participant observer.

Phase 9

Researcher Collected the Reactions of Pre-Service Teachers and Teacher Educators towards ICTACLA. Conducted written Semi-Structured Interview about the orientation programme on ICTACLA in terms of specific aspects. Conducted the Focus Group Discussion with the Pre-Service Teachers regarding the orientation programme on ICTACLA which was video recorded. Conducted Post-Test on ICTACLA to know the exiting level of Pre-Service Teachers on ICTACLA.

The researcher conducted the Post-Test on the Control group also.

Data Analysis Techniques Employed

The collected data were analyzed both qualitatively and quantitatively. Responses on the Questionnaires were analyzed through Chi Square Contingency; Responses on the Reaction scales were analyzed through Chi Square. Observations were analyzed through frequency percentage count, Chi Square and Academic Achievement analyzed through Mean, SD and 't test'. Semi-Structured Interview and Focused Group Discussions, Pre-Service Teachers' Diary and the Researchers' Field notes were Content Analyzed. Lesson designs were analyzed by Rubric through frequency and percentage.

Objective wise, tool wise the data analysis techniques have presented in the Table 1.

Table 1. Objectives and Tools wise Analysis of the Collected Data

Objectives	Tools / Programme	Analysis Techniques Employed
1	ICTACLA	Designed, Developed and Validated.
2.1, 2.2 & 2.3	Reaction scales	Chi Square & Frequency, Percentage Count
2.4	Achievement test	Mean, S.D. and t- test
2.5	Observation	Frequency & Percentage count & Chi Square
2.6	Semi-Structured Interview	Content Analysis
2.6	Focused Group Discussion	Content Analysis
2.7	Pre-Service Teacher's Diary & Researcher's Diary	Content Analysis
3	Questionnaire	Chi Square Contingency

Findings of the Study

Based on the analysis of the collected data, the following findings were obtained. The findings are presented objective wise as follows:

Finding of the Objective no. 1

- ❑ ICT Aided Constructivist Learning Approach (ICTACLA) inclusive of Lesson Designs through ICTACLA and Introductory User Manual was found to be well developed.

Findings of Objective no. 2

- ❑ The Pre-Service Teachers, School Students and Teacher Educators were found to have favourable reactions towards the developed programme based on ICTACLA.
- ❑ There has been found significant difference between the Post-Test mean and Pre-Test mean scores of single group Pre-Test and Post-test of the School Students. So the classes conducted through ICTACLA in schools by Pre-Service Teachers have found to be effective. So the Intervention provided to the Pre-Service Teachers has been found to be effective.
- ❑ A large majority of the Pre-Service Teachers has very often and often manifested ICT Aided Constructivist behaviours in the Practice Teaching classes, as observed by the Researcher, The Science Pre-Service Teachers and Teacher Educators.
- ❑ There has been found be no significant difference in the observations of practice teaching lessons by the Researchers, Pre-Service Teachers and Teacher Educators. Hence the observations made by all the three are in tune with each other.
- ❑ ICTACLA in Science has been found to be innovative through which the teaching-learning in Science has become meaningful and ICTACLA has been found to be very effective in Science Teaching & Learning, as evident through the Interview by the Researcher with the Pre-Service Teachers.
- ❑ Through Researchers' Field Notes it has been found that the Pre-Service Teachers' got acquainted with the ICTACLA progressively, and found it to be an effective approach.
- ❑ The Pre-Service Teachers experienced a new and efficient way of teaching-learning as evident through Pre-Service Teachers' Diaries.

Findings of Objective no. 3

- There has been found a significant difference between the observed frequencies on perceptions of Experimental group of Pre-Service Teachers as Learners Pre-Intervention and Post-Intervention.
- There has been found a significant difference between the observed frequencies on perceptions of Experimental group of Pre-Service Teachers as Teachers Pre-Intervention and Post-Intervention.
- There has been found a significant difference between the observed frequencies on perceptions of Experimental group of Pre-Service Teachers both As Learners and As Teachers Pre - Intervention and Post - Intervention.
- The frequencies at the Post-Intervention level of the Experimental group are on the higher points of the scale namely Very Good and Good have been found to be greater than those at the Pre-Intervention level of Experimental group. So, the Intervention has been found to be effective.
- There has been found no significant difference between the observed frequencies on perceptions of Control group of Pre-Service Teachers As Learners Pre-Intervention and Post Intervention.
- There has been found no significant difference between the observed frequencies on perceptions of Control group of Pre-Service Teachers As Teachers Pre-Intervention and Post Intervention.
- There has been found no significant difference between the observed frequencies on perceptions of Control group of Pre-Service Teachers both As Learners and As Teachers Pre-Intervention and Post Intervention.
- There has been found no significant difference between the observed frequencies on perceptions of Experimental group and Control group of Pre-Service Teachers As Learners Pre-Intervention.
- There has been found no significant difference between the observed frequencies on perceptions of Experimental group and Control group of Pre-Service Teachers As Teachers Pre-Intervention.
- There has been found no significant difference between the observed frequencies on perceptions of Experimental group and Control group of Pre-Service Teachers both As Learners and As Teachers Pre-Intervention.

- ❑ There has been found a significant difference between the observed frequencies on perceptions of Experimental group and Control group of Pre-Service Teachers As Learners Post-Intervention.
- ❑ There has been found a significant difference between the observed frequencies on perceptions of Experimental group and Control group of Pre-Service Teachers As Teachers Post-Intervention.
- ❑ There has been found a significant difference between the observed frequencies on perceptions of Experimental group and Control group of Pre-Service Teachers both As Learners and As Teachers Post-Intervention.
- ❑ It is evident from all the findings that the ICTACLA has been found to be effective at both the Teacher Education and School level.
- ❑ It is evident through all the findings that the ICTACLA has been found to be effective in facilitating the Professional Development of the Pre-Service Teachers.

Conclusion

Every individual learner is a Scientist. New knowledge is constructed by scaffolding to earlier one by meta-cognizing the abilities. In reality the understanding of the concepts is possible only when a learner attaches meaning to it and applies it to his own social environment. The philosophy of Constructivism offers the opportunities to engage, to explore the idea through germination, incubation, creation and construction of new knowledge. ICTACLA has been found to be effective for the professional development of the Pre-Service Teachers as evident both at Teacher Education College level and School level. It has transformed the Pre-Service Teachers into teaching Scientists and students to constructors of knowledge. The orientation on ICTACLA helped the Pre-Service Teachers not only to be aware of ICTACLA, but also made them creative and critical thinkers, problem-solvers and developed communication skills and leadership skills. They come to know about their abilities of learning when freedom in the Science classes was given. When the Pre-Service Teacher's put ICTACLA into practice in schools, school students scored well in the achievement test. Group discussions made them to develop and foster positive attitude towards learning of Science. Implementation of ICTACLA and getting along with the ICTACLA for Pre-Service Teachers was challenging initially. The present study has very well demonstrated that despite the limited ICT accessibility in schools, how procuring ICT

facilities on their own the Pre-Service Teachers have used it employing constructivist approach for Science teaching-learning. The interest, curiosity and dedication of the Pre-Service Teachers developed them into Techno-Constructivists. The Constructivist approach demands round the clock curiosity and sensitivity and its follow up into experimentation establishing cause and effect arriving at principles and inventions and constructions thereof. In nut shell, the study reveals that there is a need of construction and production along with consumption. Science as a discipline can remain alive only with progressive revelation and construction. The present Education system needs innovative models of professional development for both the Pre-Service and In-Service Teachers to keep them and their students updated in the changing world. The present piece of research is a sincere and humble effort to put the theory into practice.

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Innovative Practices in Teacher Education Institutions of Gujarat

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ABSTRACT

This Research paper focuses on Innovative practices in Teacher Education Institutions of the Gujarat State. Each Innovative Practice was explored in terms of Preliminaries, Objectives of the practice, Description of the Practice, Practice Context & the Need Addressed, Sources & Resources Required, Voices of Student-Teachers, Practice Outcome, Innovativeness of the Practice and Requirements for Adoption & Adaptation. Educational implications have been brought out. The paper concludes that various innovative practices in the Teacher Education Institutions are playing a vital role in enhancing the quality of Teacher Education.

Introduction

The pattern of Education is changing very fast. Many a new phenomena, viz., Scientific and Technological advancement, Industrialization, Globalization and Modernization have emerged in the Society. Education is a discipline for preparing to meet the challenges to lead meaningful life. The modern generation needs compatible skills, updated knowledge, latest information of changing social needs, technologies and attitudes to make them fit to survive gracefully. Lifelong and continuous learning is the need of the modern age to empower the modern generation. So, there is need Powerful Education System.

UNESCO's Commission on Education (1972) declared that education is a lifelong process and its purpose is to establish a learning society, i.e., a society that knows how to learn, to grow and to transform itself to the needs of ever changing world. It is

only through learning that one acquires knowledge and this knowledge comes mainly through education. The process of education is shaped and moulded by the human personality called the teacher, who plays a crucial role in education of country. In order to meet the demands of globalization the educational system of the country needs more efficient, as well as, competent teachers. The quality of teachers mostly depends on the Teacher Education Programme of any nation. National Policy on Education (NPE, 1986) has rightly emphasized, “The status of teacher reflects the socio-cultural ethos of the society and no people can rise above the level of its teacher. Good teachers are concerned it can be produced only when we have good and effective Teacher Education Programme.”

According to National Curriculum Framework for Teacher Education (NCFTE, 2009), ‘A teacher needs to be prepared in relation to the needs and demands arising in the school context, to engage with questions of school knowledge, the learner and the learning process. The expectations of the school system from a teacher changes from time to time, responding to the broader social, economic and political changes taking place in the society.’ On this background of demand and expectation from schools and society, Teacher Education Programmes need to be strengthened in all aspects adding innovative ideas and practices.

Education commission (1964-66) says, ‘Of all different factors which influence the quality of education and its contribution to national development, the quality, competence and character of teachers are undoubtedly the most significant. Nothing is more important than securing a sufficient supply of high quality of recruits to the training profession, providing them with the best possible professional preparation and creating satisfactory conditions of work in which they can be fully effective’. The quality of Teacher Education in our country especially at the secondary level is far from satisfactory. This may be due to lack of focus on providing meaning full experiences to the student-teachers trained for secondary classes. Thus, insufficiently trained teacher may fail to make quality citizens for the country.

According to Goel & Goel (2012) “Teacher Education is a discipline which educates the progressive generations on what has gone by, where we are, where we want to go, and what we like to create, observing healthy, meaningful and long life.”

Education system of our country is in the process of change. We all know that no educational reform can be successful unless the quality of teacher is improved; but in

turn the quality of teacher depends to a large extent on the quality of Teacher Education.

During the last five decades, certain efforts have been made to indigenize the system. The gaps, however, are still wide and visible. The imperatives for building the bridges may be as follows: (NCFTE, 2009)

1. To build a national system of Teacher Education based on India's cultural ethos, its lenity and diversity synchronizing with change and continuity.
2. To facilitate the realization of the constitutional goals and emergence of the new social order.
3. To prepare professionally competent teachers to perform their roles effectively as per needs of the society.
4. To upgrade the stranded of Teacher Education, enhance the professional and social status of teachers and develop amongst them a sense of commitment.

Entering into the 21st century does not mean a simple shift of calendar year. Presently, we are in the 'Knowledge Era' which is supported by high and low technology. As teachers are the king point of any education system, their enrichment and training is of at most importance.

Due to the evolutionary developments, standards of learning have become higher in the 21st century than it had been in the 20th century. As a result, teachers would need to acquire additional knowledge and skills, both general and specific, to be able to survive and be successful in the 21st century school environment.

1.1 Implications of the Reviewed Literature for the Present Study

Total 58 studies were reviewed in 5 different categories, namely, Studies on Teacher Education Programme, Studies on Teacher Education Curriculum, Studies on Specific Skills and Methods in Teacher Education, Studies related to Innovative Proneness of Teachers and Studies on Innovative Practices in Teacher Education Programme.

There were studies on relative effectiveness of teaching through Traditional Method and Innovative Method. Most of the studies used Survey method and tools, such as, Questionnaire, Observation Schedule, Interview Schedule, Rating Scale, Attitude Scale, Check List, Portfolio and Techniques like Interview and Participant Observation.

The studies reviewed on "Innovative Practices in Teacher Education Programme" revealed that the pre-practice teaching preparation is the base on which the structure

of student teaching is laid. In certain States of India, the programme has not been found to be effective. It may be worthwhile to study various types of programmes being carried out for such a preparation, as well as, practice teaching programmes. Not only the practice teaching provisions are to be made, but, adequate supervision, guidance and feedback are necessary for its effective utilization.

The studies reviewed on “Teacher Education Programme” revealed that the pre-practice teaching preparation is the base on which the structure of student teaching is laid. In certain States of India, the programme has not been found to be effective. It may be worthwhile to study various types of programmes being carried out for such a preparation, as well as, practice teaching programmes.

The review of related literature revealed that most of the studies concentrated on the factors affecting the innovations, ICT integration, duration of the course, finance and resource availability, guidance, attitude and proneness of Teacher Educators, types of governing body, i.e., Government & Self-financed, Role of Headship, Curriculum, Method of Teaching, Practice Teaching, Micro-Teaching, Team Supervision, Criticism of Lesson and Climate of the Organization.

The reviewed Studies on “Teacher Education Curriculum” revealed that the present Teacher Education Curriculum is too much theoretical. In fact, it is this large component of theory papers that has hampered the growth of practical and pedagogical aspects of the programme. This has in turn impeded the growth of Teacher Education. Most of the studies pointed out the drawbacks of the existing Curriculum of the Teacher Education Programme. It is encouraging to note that steps were taken by NCTE to rectify the defects and make the curriculum up to date to meet the requirements.

A total 8 studies were reviewed on “Innovative Skills and Methods in Teacher Education” which mainly focused on Micro-Teaching technique in the controlled laboratory environment, skill integration in practice teaching and strategies implemented for the integration of skills & cooperative learning.

Literature suggested that the Teacher Education Institutions were lacking various things required to enhance its quality. In the last 2 decades a large number of such colleges have been opened in each State of India. With the quantitative increase the quality has reduced.

The reviews revealed that most of the studies employed survey and comparative methods to study the Innovative Practices. Keeping in mind the recent Innovations in

Technology and Global Teacher Education, our Teacher Education needs to be enhanced in terms of, use of technology, Methodology for Curriculum Transaction and Practice Teaching. It is evident that there is a scarcity of research on Innovative Practices in Teacher Education. More researches are needed for implementing innovative practices in Teacher Education across the country. Hence, the present study has attempted to explore the Innovative Practices in Teacher Education.

Rationale of the Study

Teacher Education means programmes of education and research which equip an individual to teach at schools. The role of teacher has been changing from being a knowledgeable person on the stage to a facilitator and guide beside. In this context the Teacher Education Programme is undergoing changes nationally as well as internationally. The NCTE (2004) stating that, “The programme of Teacher Education is institution based. The students are not exposed to the realities of school and community, internship, practice of teaching; practical activities are not paid proper attention. Despite the commendable improvement in service conditions and perks, the profession is yet to attract best brain”.

A teacher plays an important role in shaping the students and also the future of nation. Therefore, any nation cannot neglect the preparation of teachers. In India, Teacher Education Programme has been given importance both before and after the independence. With reference to the Teacher Education Programme many eminent personalities in the field of education from the education field i.e. Vachhrajani (2005), Goel & Goel (2005) are of the view that there is an urgent need to update the Teacher Education Programme with reference to the changing needs of society. Education is one of the major aspects of the society. So, our education system needs to bring desirable changes with the changes in society. Therefore, the teacher preparation programme needs to be updated in the light of the changing needs of society and for that adoption of innovative practices is necessary. Further, in this era of globalization, we need to prepare teachers for the global world. This can only be made possible if innovations are introduced in system to bring about quality improvement. The National Curriculum Framework (NCF, 2005) has also emphasized the need for bringing change in Teacher Education for developing professional identity of teachers and to make Teacher Education more relevant in School Education.

Further NCFTE (2009) states that, there is also a dire need to critically review the Secondary Teacher Education system. The one-year second Bachelor's degree (B.Ed.) model seems to have outlived its relevance. With the proliferation of B.Ed. colleges, particularly with privatization and commercialization, B.Ed. programmes have become weak both in theory and practice. Even the few institutions, which keep struggling to make this programme meaningful, find it difficult to overcome the structural constraints that the short duration of the programme poses. While the second Bachelor's degree model may still be relevant, it is imperative that this needs strengthening in terms of intensity, rigor and duration.

Mohd. Akhtar Siddiqui, the former chair person of National Council for Teacher Education (NCTE) emphasized upon innovation in Teacher Education Programme in these words, "Teacher Education in India is all set for revival." He further emphasized that the National Council for Teacher Education will be coming out with a new curriculum for teacher training courses. Also the council will be laying down strict regulatory norms to check the quality of Teacher Education institutes and to control the rapidly increasing of sub-standard private institutions. He also said that "teacher training in India has been getting diluted from over the years. There are good, bad and even worse institutes offering Teacher Education Programme. But along with this, there is also need to improve the quality of Teacher Education in existing institutes." Proper implementation of innovations will lead to real progress only if they are brought about in an orderly sequence of goal setting, planning and systematic execution. The aim of innovation is the change for better. Such changes bring progress. To be competitive in the period of globalization it is important to change our traditional methods so as to meet the challenges posed by the global markets. To meet these demands, a teacher must supplement or replace traditional methods of instruction with innovative educational approaches.

One of the questions that are being increasingly considered is: How best may innovation improve quality? It is not possible to answer this question in general terms other than to say that, if the current quality needs to be improved, something new will have to be done. Even if the question is rephrased such as: What innovations are likely to best improve quality of Teacher Education? The answer is still hard to define because it depends on what aspect is under consideration and what is known to work best in the specific aspect. There is, however, considerable consensus in the region

that teachers are of central importance in improving the quality of education. This implies that innovations in pre-service teacher training are a good form of investment. The rationale behind selecting the Teacher Education institutions providing training to teachers for secondary and higher-secondary education is that secondary education has a key role to play in the social, economic, and human capital development of a country. Further education at these levels is a crucial link between primary schooling and higher education. The task before today's societies is to transform secondary education institutions and current schooling practices to align them with the demands of a globalized and technology-driven world. Policymakers and educators must address the twin challenges of increasing "access to" and "quality and relevance of" secondary education for all young people.

Children of today are very advance with regard to technology. Contrary to it are our teachers who are hardly technology savvy. There is a major paradigm shift in the instructional methods with the change of time. To be competitive in the period of globalization it is important to change our traditional methods so as to meet the challenges posed by the global markets. To meet these demands, a teacher must supplement or replace traditional methods of instruction with innovative educational experiences.

Keeping in view the important role of secondary education in the development of the children, preparation of teachers for this level is indeed a very important and challenging task.

It is possible that apart from these institutions there are other Teacher Education institutions which may have adopted some innovations which have not been brought out. The researcher feels that by visiting some institutions and checking out whether any kind of innovations has been initiated by them would prove to be a fruitful exercise.

Statement of the Problem

A Study of Innovative Practices in Teacher Education Institutions of Gujarat State

Objectives of the Study

- 1) To study the status of Innovative Practices in the Secondary Level Teacher Education Institutions of Gujarat State.
- 2) To study in-depth the Innovative Practices in selected Secondary Level Teacher Education Institutions of Gujarat State.
- 3) To study the factors facilitating and impeding the implementation of innovations.

Explanation of the Terms

i. Innovative Practices

In the present study Innovative Practices include newly practiced activities in Curriculum, Modes of Transaction, Practice Teaching, Evaluation, Practical work and Co-curricular Activities in the Secondary level Teacher Education institutions of the Gujarat State. It also stands for novel, creative ideas, methods, devices and activities which are being originated in the Secondary level Teacher Education institutions.

ii. Teacher Education Institutions

In the present study, the Teacher Education institutions stand for institutions offering B.Ed. programme.

Delimitation of the Study

The study was delimited to the secondary level Teacher Education institutions.

Type of the Study

Survey method was employed for the present study.

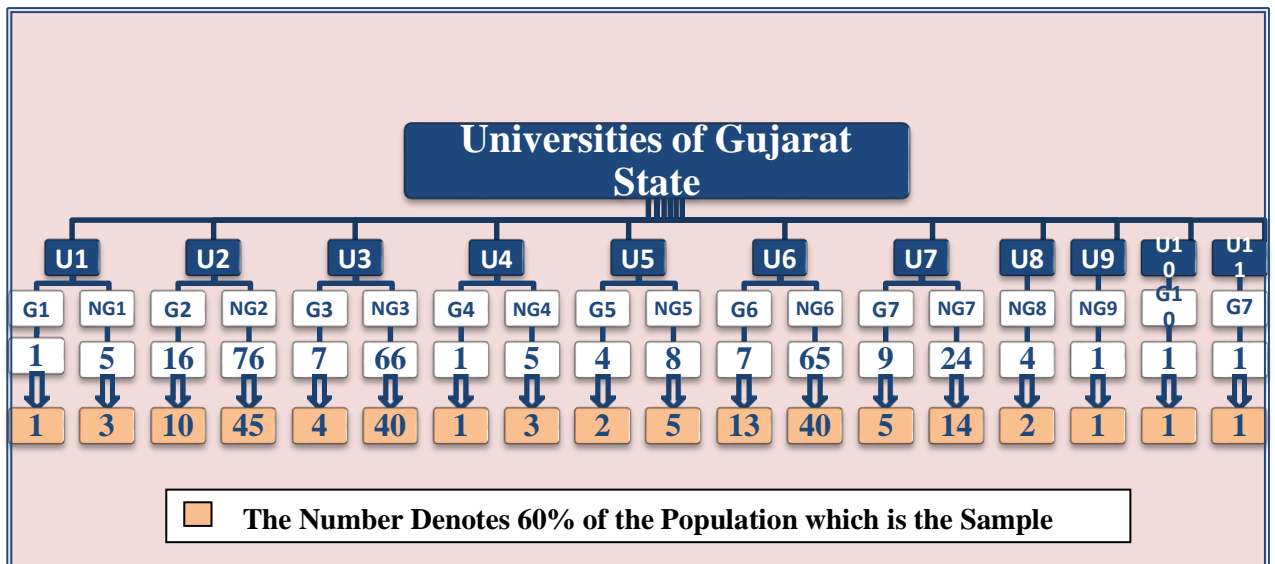
Population for the Study

The population of this study was comprised of all the Secondary level Teacher Education institutions affiliated to/run by different universities of Gujarat state. All the Principals/ Heads of the Departments, Teacher Educators and Student-Teachers of the respective Institutions during the academic year 2012-13 constituted the population.

Sample for the Study

- The sample was representative of all the eleven Universities of Gujarat State. Stratified Proportionate Random Sampling was done and 60% of the Secondary Level Teacher Education Institutions from each stratum were selected randomly.
- A total 191 Secondary level Teacher Education Institutions constituted the final sample for the study.
- All the Principals/Heads of the Departments, Teacher Educators and Student-Teachers of the selected Secondary level Teacher Education Institutions constituted the sample for the study.
- All the Teacher Educators with teaching experiences of three years constituted the sample from the selected Secondary level Teacher Education Institutions. Further, 15% Students-Teachers were selected randomly for each of the selected practices.
- Out of the 191 selected Teacher Education Institutions 42 did not provide data. So, finally 149 Institutions of Teacher Education constituted the sample for the present study.

Figure: Figure Showing Selected Sample Size



[Total selected Teacher Education Institution through Stratified Proportionate Random Sampling]

(G: Grant-in-aid, NG: Non grant-in-aid, UGS: Universities of Gujarat State)

Table: Size of Population

UGS and its Code		No. of Institution			
Code	Name of Universities	Government	Grant in Aid	Non-Grant in Aid	Total
U1	Maharaja Krushnakumarsinhji Bhavnagar University	-	01	05	06
U2	Gujarat University, Ahmedabad	01	15	76	92
U3	Hemchandracharya North Gujarat University, Patan	01	06	66	73
U4	K. Shyamji Krishna Verma Kutchh University, Bhuj	-	01	05	06
U5	S. P. University, Vallabh Vidhya Nagar	-	04	08	12
U6	Saurashtra University, Rajkot	-	07	65	72
U7	Veer Narmad South Gujarat University, Surat	02	07	24	33
U8	Kadi Sarva Vishwa Vidhyalaya, Gandhinagar	-	-	04	04
U9	Navrachana University, Vadodara	-	-	01	01
U10	Gujarat Vidyapith, Ahmedabad	-	01	-	01
U11	The M. S. University of Baroda, Vadodara	-	01	-	01
	Total	04	43	254	301
Total Population Size = [301] Teacher Education Institutions					

(Source: Data Gathered from all Universities latest Prospectus)

Tools & Techniques for Data Collection

Questionnaires, Check list, Observation Schedule, Semi-Structured Interview Schedule were employed for data collection. All these tools were constructed by the Researcher and validated by the Experts.

i. Questionnaire for Principals/Teacher Educators

Questionnaire was constructed by the researcher to study the status of innovative practices implemented by Teacher Educators and Principals.

The questionnaire constituted close-ended as well as open-ended questions based on Admission, Modes of Transaction of the Curriculum, Practice-Teaching, Internship, Guidance and feedback, Evaluation for award of grades, Practical Work, Co-Curricular Activities and adopted/adapted innovative practices.

The questionnaire was given to experts for validation and final copy of the questionnaire was made after incorporated the changes suggested by experts.

ii. Check List

A Check list was constructed by the researcher to study the status of innovative practices implemented by Teacher Educators and Principals. It contained items related to the Transaction of Curriculum, Practice-Teaching, Evaluation, Practical Work, and Co-Curricular Activities. It was validated by the experts.

iii. Questionnaire for Student-Teachers

A Questionnaire was constructed by the researcher to study the implemented Innovative Practices in Teacher Education Institutions of Gujarat State. The questionnaire constituted open-ended questions related to the orientation part, planning and implementation part, and evaluation part of Innovative Practices.

iv. Semi-Structured Interview

Semi-structured Interview was conducted to collect the data from the Principals/Heads of the Education Departments and Teacher Educators of the selected Teacher Education Institutions regarding innovative practices in their institutions and the factors facilitating and impeding the innovations.

v. Observation

Observation was done by the researcher to observe different aspects of selected innovative practices. The observation was done when the selected Innovative Practices were being presented / demonstrated and Practiced during workshop by the student-teachers. Observation was also done of the student-teachers while implementing the selected innovative practices during simulation.

vi. Document Analysis

For clarity in understanding the nature of innovative practices document analysis of the selected innovative practice was done. Lesson plans, Syllabi, Time-Tables and Photographs of the activities were included in this document analysis. A detailed list of all the documents analyzed has been provided in appendix.

Data Collection

The data were collected phase wise:

Phase - 1:

In the first phase of data collection the researcher collected data through questionnaires from the sampled Secondary Level Teacher Education Institutes to know the innovative practices prevailing therein.

Phase – 2:

In the second phase the researcher identified innovative practices which were prevailing in the Teacher Education Institutions of the Gujarat State. This identification was done based on the data collected in phase 1. The researcher personally visited the identified Teacher Education institutes and conducted interview with the Teacher Educators and Principals to know the details about innovative practices. Questionnaire was administered on student-teachers to find out their opinion regarding the particular selected innovative practices.

Phase - 3:

On the basis of the data gathered in the second phase, various innovative practices were further studied in detail, through personal visits and observation.

Data Analysis Technique Employed

All the data were analyzed by using Content Analysis. Along with this to have a comprehensive view of the Innovations Practiced by the Institutes of Education, Frequency and Percentage have been computed.

Findings of the Study

Objective 1:

- None of the Teacher Education institutions was found to administer entrance test as an admission modality. The institutions were found to be following merit based admission process where marks of under-graduation/ post-graduation were considered to prepare admission list.
- In the area of curriculum (Foundations and Optional Courses), Spoken English and Personality Development, English for Specific Purpose and Life Skills Education were found to be the new courses.
- For the all round development of the student-teachers one of the Teacher Education institutions has adopted English Spoken & Personality Development compulsory course for the enhancement of English Language and Personality Development, whereas, one institution has adopted an elective paper namely English for Specific purposes.
- With the aim to bridge the gaps between School Education and Teacher Education a separate paper - “Life Skills Education” has been introduced in one of the Teacher Education institutions.
- It was found that affiliated Teacher Education institutions of four universities and five self financed institutions have developed more than 100 ICT aided instructional material for general subjects of B.Ed. Courses.
- It was found that in many Teacher Education Institutions the faculty members use self-prepared power point presentations, downloaded videos, ready to use worksheets, and multimedia modules for the orientation lessons and theory teaching sessions.
- One of the surveyed Teacher Education institutions has introduced Reflective Way of Teaching, Dialog Mode of Seminar Instruction and Balloon Debate as innovations in Teaching Learning Process.
- Teacher Educators were found to be using interesting interactive methods, like, group discussion, doubt clearing sessions, role play, dramatization of events, and audio-visual aids related to the teaching of different components of theory papers.
- Need has been felt to introduce Constructivist Approach, Life Skills, and Multiple Intelligence.

- Two of the surveyed institutions found to be practicing Open Book Examination, wherein, one institution was found conducting Open Book Exam for all the Core and Foundation courses and another institution was found conducting Open Book Exam only for the foundation paper - Education in Emerging Indian Society.
- Most of the Teacher Education Institutions have adopted Semester System - pattern with Seven Point of Grading Scale.
- Most of the Teacher Education institutions were found to be following Micro-Teaching approach.
- Out of 11 universities only one Teacher Education institutions has adopted Simulated Stage Teaching Practice (SSTP) approach as part of Practice Teaching.
- Majority of the Teacher Education Institutions were following the traditional approach for block teaching/Practice teaching, i.e., going to schools in two phases, after simulation or micro teaching.
- Skills that were found to be focused during practice teaching in schools were - framing objectives in lesson plans, use of A.V. Aids, explanation, conducting activities in classroom, use of Black Board, group work, confidence, voice modulation, dealing with students, and giving reinforcement in evaluation of practice teaching.
- Four of the Teacher Education Institutions were found to be involved with some new practices, like, providing opportunities to teach in different types of schools i.e. rural school, urban school, and sub-urban school.
- Two institutions were found to be providing International School Teaching exposure to their student-teachers.
- Four of the institutions were found to be giving training to the student-teachers using Smart Board/Interactive White board for practicing in schools.
- Most of the institutions were found to be following Skill Based Teaching Practice (SBTP) based on Micro-teaching to provide awareness to student teachers about teaching skills and their use in practical aspects of teaching learning in schools.
- It was observed that out of 11 universities surveyed, six universities were having a specific format of lesson plans whereas other universities are giving freedom to the institutes to make lesson plans on their own.

- One of the self financed colleges was found to incorporate Value and Activity Based learning components in their lesson plans.
- Only one university was found implementing Multiple Intelligence Based Lesson Plans.
- Very less number of Teacher Education institutions have implemented innovative lesson designing in Practice Teaching, i.e., Life skills based, Multiple Intelligence based, Constructivist Approach based and Digital lesson plans.
- One of the private universities has adopted Constructivist Approach lesson designing. After practicing in a simulated condition the student-teacher take up lessons in schools during practice teaching phase.
- One of the surveyed Teacher Education Institutions has adopted Script writing practice based lesson plan.
- One institution was found practicing for the Enhancement of content knowledge among student-teachers in Teaching Learning Process through Participatory Learning.
- One institution was found to be focusing on incorporating 30 percent extra information in science lesson plans by practicing spark sessions.
- Only two universities have adopted rubric to give feedback along with the oral feedback whereas in other institutions Teacher Educator grades each lesson on a Rating Scale.
- To maintain objectivity in practical lessons some of the universities have designed a format in the form of mark sheet which contains criteria for evaluating the lessons.
- It was found that for Teacher Educators it is not possible to observe full 35 minutes lesson as he/she has to observe 2-3 lessons together at the same period of time.
- Teacher Educators were also of the opinion that student-teachers need to observe the lessons of school teachers in various subjects or at least in their respective teaching methods, to enhance their understanding of teaching skills.
- Peer observation practice was also seen in school based practice teaching of many institutions.
- Internship programme was conducted through on campus as well as off-campus mode.

- Internship programmes in all the surveyed institutions were pre-planned. It was observed that the Teacher Education institutions have developed special module for internship programmes.
- With the aim to make the student-teacher capable enough to work with the rural school environment & community where the student-teachers take part in each and every activity under the guidance of Supervisor, off Campus practice was organized by one of the surveyed institutions at a minimum distance of 500 Km.
- One of the institutions was found practicing annual test lessons where textbook materials were not allowed to be taught during annual test lessons.
- One of the Teacher Education Institutions was found giving training of 40 hours for preparing digital Lessons.
- For developing computer skills most of the institutions have adopted a practice of submission of E-Plan to enable the student-teachers to design computer based interactive teaching leaning presentation.
- Student-teachers prepare computer aided material as teaching aids which could be considered as one of the practical work submissions.
- From the surveyed Teacher Education institutions it was noticed that only two institutions were giving innovative projects to the student-teachers.
- Experience method was adopted for Account, Commerce, Economics and Social Science method student-teachers.
- Seminar organization was practiced in some organizations. Current educational issues form the discussion part of these seminars.
- Action Research was now discontinued in some of the universities.
- Submissions of reports of Case Studies of practice teaching schools were observed by some institutions.
- One of the Teacher Education institutions was found practicing Reflective Diary writing. In this practice the student-teachers maintain Reflective Diary in which they write all their reflections related to the programme during the whole academic year.
- One of the institutions was found practicing Dream School Work with the aim of exploring the vision of student-teachers about a school.
- No Teacher Education institute was found to be practicing to deal with the CCE practice due to time constrains and lack of permission from school. It is

not possible for student-teachers to learn practicing of CCE in schools within the time limitations allotted for practice teaching.

- With the aim to provide hands on experience to the student-teachers to evaluate answer scripts of school students' answer sheet is provided to student-teachers and after checking discussion is organized to understand the level of evaluation.
- With the aim at training future teachers, one of the surveyed institutions was found giving training to conduct online examinations which might help to reduce the burden of evaluation.
- One of the surveyed Teacher Education Institutions was found imparting Seven Habits of Highly Effective people by Stephen Covey among student-teachers.
- With the aim to develop values among student-teachers one of the institutions found practicing Value Week celebration.
- It was found that four institutions were having Open Educational Resources for the access of various important e-materials which is to be downloaded from their respective website.
- Only two institutions were found to be very actively doing Socially Useful Productive Work.
- One of the institutions was found practicing Creative Hands with the aim to organize exhibition by preparing creative materials in the Teacher Education institution.
- Many of the Teacher Education institutions were found to have a Remedial Program for academically low achievers.

Objective 2:

Basing on the findings of objective 1, some Innovative practices are presented under the heading of Innovative Practices in objective 2, as follows.

- Scripting the lesson in dialogue form encouraged teacher trainees to reach balanced teacher-student talk categories, tried to be better organized and more confident in front of students.
- Constructivist approach based lesson plans made teaching and learning enjoyable for both pre-service teachers and the learners.

- Reflective Diary Writing practice helped the student-teachers to learn many things from their peers to become better teachers and enabled them by improving their personal attributes, since this practice taught them critical self analysis.
- Digital lesson plan application of ICT improved the achievements of pre-service teachers by enhancing their ICT skills and school students in their classes.
- The ICT Integration in curriculum transaction helped the student-teachers, as well as, Teacher Educators in the learning process and encouraged them to use various multimedia learning resources.
- Home Room Practice improved the one-to-one interaction between the student-teachers and the Teacher Educator, which has helped to solve many of their academic and other problems.
- The student-teachers could increase the sense of social responsibility participating in community work.
- Multiple Intelligence based lesson plan helped the student-teachers extend the boundaries of traditional classroom, considering different talents and abilities of the students.
- The student-teachers learnt the concept of life skills through active learning and participation in school practice teaching programme.
- By getting teaching experience in international school the student-teachers could learn the skills to deal with students with global perspective.
- The communication skills of student-teachers developed significantly by creating active learning environment through Dialog Mode of Seminar Instruction.
- Participatory learning approach enriched the content learning of the participants.
- *Gramjeevan Padyatra* helped the student-teachers to develop awareness about the rural community and schools.
- Career Centered activity strengthened the student-teachers.
- Creative hands activity encouraged and improved managerial skills of student-teachers.
- Spark sessions helped the student-teachers to gain a lot of information which contributed to enrich their teaching learning programme.

- Simulated Stage Teaching Practice made the teaching practice easier for the student-teachers to get into their roles, focus on specific stages in a process and it enabled them to deal with varieties of situations.
- Open Book Exam though liked by a majority of the student-teachers as an innovative practice, but time required for attempting open book examination questions was found to be an impeding factor.
- The Activity & Value based lesson plan practice made the student-teachers to develop and use activities more effectively in the teaching learning environment.
- The student-teachers found the group activities and group presentations in Spoken English and Personality Development practice encouraging them to start speaking English
- Balloon debate practice improved the student-teachers' writing and speaking skills as they enabled to produce more developed arguments.
- The Dream school work encouraged the student-teachers to envision all the important aspects of a school by analytical thinking.
- By observing Demonstration lesson, the student-teachers could learn many skills of teaching and classroom management.
- Construction of a Concept Map during lesson planning process helped pre-service teachers to be more reflective in their instructional decision making.
- Rubric use in checking the progress of student-teachers' teaching practice and also to check the progress of school students by student-teachers emerged as an innovation.
- Code of Conduct sessions facilitated the student-teachers to gain professional etiquettes.
- By getting experience from long distance off campus internship programme, the student-teachers could learn to deal with different types of students and environment.
- The student-teachers found that the Open Educational Resources practice was useful and it facilitated their learning.
- Smart Board practice increased the confidence of the student-teachers.
- TAT/TET sessions made the student-teachers aware of the types of questions that are asked.

- Grouping helped the student-teachers learn different subjects especially Educational Evaluation.
- By evaluating the answer sheets the student-teachers familiarised with the grading pattern, criteria of evaluation and types of questions to be framed.
- The practice of online examinations helped the student-teachers to know about the precautions to be taken as well as various aspects that have to be taken care of in open examination.
- By teaching in a variety of schools the student-teachers experienced the different strategies which have to be modified as per the school and level of students.
- Educational panorama practice enabled the student-teachers to create awareness about various useful websites related to their teaching methods.
- Visit method gave a sense of confidence to the student-teachers when they went to teach in schools during practice teaching sessions.
- Educational Forum provided a lot of information about various social and educational topics and it enhanced their communication ability.
- By taking outside textbook lesson for annual test lessons the student-teachers learnt new things, faced challenges and to overcome them.
- Through Value Week celebration, the student-teachers experienced the importance of values to lead life.

Objective 3:

- Decision making of major innovative practices in the Teacher Education institutions has the double characteristic of being both consultative and authority based.
- Governing bodies of institutions take interest in the decision making on innovations, especially when it is the matter of institutions objectives, policies and financial concerns.
- The teaching staff were frequently consulted and involved in the decisions relating to adoption of innovative practices in the various institutions.
- Innovative practices adopted in participative consultation with the staff have a greater chance of continuance in institutions.

- Decisions for the adoption of innovative practices were taken consultatively and through participative discussion with the staff which enhanced the chances of their success in achieving the objectives.
- The staff meetings, both, departmental and university level, and their frequency regularity and the quality of interactions and communication therein contribute to the success of innovations.
- The new administrative structures set up in autonomous institutions, such as, Academic Council, Boards of Studies and Boards of Examiners provide forums for the participation of Teacher Educators in the decision making in general, and particularly on the implementation of innovative practices.

Implications of the Study

- Apex agencies of India such as NCTE, UGC, NCERT, and AICTE should promote innovative practices in Teacher Education.
- Professional development programmes should be organized on innovative practices for deployment of the innovative practices.
- Innovative Practices in Teacher Education should be appreciated through suitable rewards at the State level and national level.
- Innovative practices should be integrated in the Teacher Education curricula.
- Once the value of innovative practices in Teacher Education is established the NCTE should work out its norms and standards for deployment.
- The Board of Studies of the Education Departments should have experts to examine judiciously the proposed Innovations.
- The expert committees of the apex bodies should have experts to examine the proposed innovations.
- The institutes of education should discuss the innovations to be proposed in their departmental committees.
- The institutes of education should make due provisions for the incubation and institutionalization of the innovations.
- Policy makers and Administrators should encourage Innovations.
- Teacher Educators should develop their understanding about Innovations and their use in the teaching learning.
- Teacher Education Institutions should make provisions for implementing Innovations.

Conclusion

About one tenth of the respondent Colleges of Education have been found to practice innovations in their Colleges of Education. Maximum number of innovations has been found to be practiced by School of Science and Education - Navrachna University. Next in the series are Anand College of Education, Way Made College of Education, H. R. Gajwani College of Education and R. H. Patel English Medium B.Ed. College, The M. S. University of Baroda, J. G. College of Education, M. B. Patel College of Education, M. N. Shukla College of Education, I. J. Patel College of Education, New Progressive College of Education, Gujarat Vidhyapeeth, S. D. Sethiya College of Education, Shri Rang Shikshan Mahavidyalaya and L.N.K College of Education.

It is the evident that five institutions of Teacher Education out of a total of 15 Institutes of Education have been found to offer more than fifty five percent of the innovations. A variety of innovations, namely, Constructivist Approach, Multiple Intelligence, Life Skills, Digital Lessons, Activity and Value base lessons, Simulated Stage Teaching Practice, International School Practice Teaching, ICT Integrated Teaching, Home Room, Reflective Diary Writing, Balloon Debate, Spark Sessions, Open Book Examination, Participatory Learning Approach, Dialog Method Approach, Career Centered Activity, Creative Hands, Seven Habits of Life Skills, Community Work Participation, Gramjeevan Padyatra, English Spoken and Personality Development, English for Specific Purpose, School of My Dream, Demonstration lessons, Concept Mapping, Rubric Making, Open Educational Resources, Educational Instructions through Smart Boards, Aptitude Testing for grouping of the student-teachers, Interactions with the assessed answer sheets of school students by the student-teachers, Online Examination, Multi perspective Teaching, Educational panorama, Annual Test lessons excluding prescribed Textbook contents, Education Forum, Value Week Celebration, Long Distance Off Campus Practice Teaching, Saasu-Vahu Sammelan and Self Regulation have been found to be practiced by the Institutes of Education in Gujarat State.

Facilitating factors for adapting/adopting innovative practices have been found as identification with the philosophy of the innovative practices such as cooperative learning, identification with the research endeavour, and prior experience of Teacher Educators. The impeding factors in institutionalizing the innovations have been found to be limited time available for the course coverage, lack of confidence in

innovations, inability to convince colleagues, curricular restrictions, negative attitude and lack of faith of Teacher Educators, lack of interest of student-teachers, diffidence of Teacher Educators, low expected perceptible return through investment on innovations, lack of ICT competency, lack of resources and incentives, lack of participation in decision making, imposition of innovation by the external agencies, lack of priority and leadership.

It is a happy moment to note that a variety of innovations have emerged from the Institutes of Education in the Gujarat State, originated by the institutes of the Education, adapted or adopted. Though only about one tenth of the Teacher Education institutions have been found to observe innovative practices but their passion, dedication and immersion have been found to be largely marvellous. The developmental challenges of the present era demand round the clock innovations. Any innovation irrespective of its origin ought to be the responsibility of all.

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TQM of Teacher Education

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ABSTRACT

The preset paper attempts to study the TQM of Teacher Education Institutions in Gujarat State, both, Public & Private in terms of Work Place Culture of the Institution, Teaching Learning Scenario of the Institution, Administration of the Institution, Professional Development of the Teachers, Infrastructural Facilities of the Institution and Networking with Alumni, Educational Organizations & Industries. A five point Perception Scale was constructed by the investigator to seek the perceptions of Teacher Educators on TQM in their institutions. Workplace Culture, Teaching Learning Scenario, Administration, and Professional Development of one of the Private Teacher Education Institutions have been found to be greatest amongst all the three institutions where the TQM was studied. Infrastructural facilities have been found to be higher in both the Private Teacher Education Institutions as compared to the Public Institution. Networking has been found to be greater in the Public Institution than that of both the Private Teacher Education Institutions. All the Teacher Education Institutions ought to learn from the profiles of each other. There is a dire need to enhance the infrastructural facilities & Academic Climate of the Public Teacher Education Institutions.

INTRODUCTION

The advantages of Total Quality management (TQM) have been valued by all. Many organizations have achieved excellence by practicing TQM. Most of the principles of TQM can be implemented in the domains of Teacher Education. This paper presents the essence of TQM, a scenario of TQM in Teacher Education institutions and how the Teacher Education institutions can enhance the Total Quality.

The investigator has come across various studies related to Secondary Teacher Education Institutions and the review of related literature revealed that teacher education plays a significant role in universe development. Education plays a vital role. It is rightly said that the future of a country is in the hands of children who are in schools. Teachers' responsibility is to mould the children into valuable members of the society and draw the best out of them. Therefore, the convergence today is on the relevance and quality of Teacher Education Institutions. The various studies conducted on Teacher Education, namely, Bhatia (1987), Kohli (1974) focused on curriculum revision in accordance with societal needs. Studies conducted by Trivedi (1966), Joshi (1974), Panchal (1977), focused on innovation practices in Secondary Teacher Training Institutions. Studies conducted by Dash (1985) focused on the development of Teacher Education institutions in terms of quality & social services. A Study conducted by Gupta (1985) focused on the problems faced by these institutions. Studies conducted by Vats (1972) focused on administration and management, whereas, Pandey (1969) & SIE (Gujarat) (1969) focused on the status of Teacher Education Institutions. Study conducted by Yeshodhara and Pour (2010) focused on the Total Quality Management in Education. Articles by Dedhia (1995), Prasad (1998), Bhalla (2012) focused on the perspectives of TQM in Education. A study conducted by Kumar & Manjunath (2012) focused on TQM & productivity.

Quality created by the creator ought to be sustained & nurtured by the created. No institution can remain healthy and survive unless its people work honestly, diligently and continuously. Quality is a construct of vision & mission which demands commitment. Quality is a way of life. It needs inner driving force. It demands a quality culture which depends upon visionary leadership, meticulous organization, healthy environment, & efficient management. Quality is all pervasive. The spirit of quality can be best nurtured by observing it in every bit of act. Quality is in our

minds. It springs naturally, beautifully, and blissfully through sensitivity & concern. There can be no quality without substance. There can be no identity without entity. Teacher Education needs to revive & realize its identity.

RATIONALE OF THE STUDY

For a democratic and developing country like India, Education is linked with national development in all facets. The task of building an enlightened, strong, and prosperous nation rests on its children who are to be nurtured. To achieve this goal of national development, mere enrolment is not enough. It is also important what kind of education is provided by the schools. Quality Education demands Quality Teachers. For this we ought to establish Quality Teacher Education Institutions.

Government of India has taken some steps to meet the needs of quality Teacher Education institutions and raise their standard. As envisaged in the latest National Policy on Education and Programme of Action (1986), the centrally sponsored scheme of Restructuring and Reorganizing Teacher Education was taken up in 1987 to create a viable institutional infrastructure, academic and technical resource base for orientation, training and continuous up gradation of knowledge, competence and pedagogical skills of school teachers in the country. National Council of Teacher Education (NCTE) was established in August 1995 with a view to achieve planned and co-ordinate development of teacher education system throughout the country to regulate and observing standard of Teacher Education.

The focus of the present study is the Total Quality Management (TQM) of Teacher Education. The Investigator wants to find the TQM of secondary teacher education institutions in Gujarat. Various aspects have been considered, such as, a) Infrastructural amenities provided b) professional development of the staff c) leadership qualities of the heads and the administrators d) contribution of institutions in social development, and e) curricular aspects.

Total Quality Management was initially focused in Industries to enhance the quality of Industrial parameters- input, process, throughput, output and market. In 1992 Edward Demming took the initiative of employing TQM in education field. Although quality in education is a massive

challenge, since industries deal with goods of some kind, whereas, education deals with human beings. Commitment to quality makes students proud to learn and work diligently for improvement. Quality improvement is a never ending process.. Hence, insight into quality indices needs to be given due attention.

STATEMENT OF THE PROBLEM

Total Quality Management in the Secondary Teacher Education Institutions

OBJECTIVES OF THE STUDY

- 1) To study the perception of Teacher Educators on TQM of their Institutions.
- 2) To compare the Teacher Education Institutions based on the following criteria:
 - Work Place Culture of the Institution
 - Teaching Learning Scenario of the Institution
 - Administration of the Institution
 - Professional Development of the Teachers
 - Infrastructural Facilities of the Institution
 - Networking with Alumni, Educational Organizations & Industries

HYPOTHESES OF THE STUDY

- 1) There is no significant difference between the workplace culture of the selected Teacher Education Institutions.
- 2) There is no significant difference between the teaching learning scenario of the selected institutions.
- 3) There is no significant difference between the administration of the selected institutions.
- 4) There is no significant difference between the professional development of the teachers of the selected institutions.
- 5) There is no significant difference between the infrastructural facilities of the selected institutions.
- 6) There is no significant difference between the networking with alumni, educational organizations & industries of the selected institutions.

EXPLANATION OF THE TERM

Total Quality Management: It is a quality management strategy, which can be applied as a means for improving student/staff morale, increasing productivity and delivering higher quality services to both internal and external customers.

OPERATIONALIZATION OF THE TERM

Total Quality Management: Perceptions of the teacher educators on TQM in their institutions were studied through a Perception Scale which contained Statements on various aspects of TQM.

DELIMITATION OF THE STUDY

The Study was delimited to the three English Medium Secondary Teacher Education Institutions of Gujarat.

METHODOLOGY

DESIGN

The present study is a descriptive survey.

POPULATION

The population for the present study comprised of all the Teacher Educators of the English Medium Secondary Teacher Education Institutions of one of the States of India.

SAMPLE

Out of nine English Medium Teacher Education Institutions in the State three (Two Private & One Public) were conveniently selected by the investigator. All the Teacher Educators of the selected institutions constituted the sample for the study.

TOOLS FOR DATA COLLECTION

A five point Perception Scale was constructed by the investigator to seek the perceptions of Teacher Educators on TQM in their institutions.

DESCRIPTION OF THE TOOLS

The Perception Scale (Five point Likert Scale) consisted of 53 close ended items based on different dimensions (i) Workplace culture of the institution (15 items), (ii) Teaching learning scenario of the institution (15 items), (iii) Administration of the institution (6 items), (iv) Professional development of teachers (5 items), (v) Infrastructural facilities in the institutions (9 items) & (vi) Networking with alumni, educational organizations & industries (3 items).

At the end there was an open ended item on suggestions of Teacher Educators for enhancement of TQM in their institutions.

DATA COLLECTION

The investigator administered the perception scale on the Teacher Educators.

DATA ANALYSIS

The responses of the teacher educators were analyzed quantitatively using frequency & percentage. The suggestions for enhancement of TQM were analyzed qualitatively using content analysis technique .

FINDING S OF THE STUDY

Findings of the study have been presented institution-wise as follows:

A. Teacher Education Institution -1

1. Workplace Culture of the Department

- 1) 50% of the respondents have perceived that the teachers always seek new ideas, 40% often, whereas 10% sometimes.
- 2) 30% of the respondents have perceived that there is always an ongoing collaborative work across subject areas, whereas 70% often.
- 3) 60% of the respondents have perceived that teachers' ideas are always listened to in the institution, 30% often, whereas 10% sometimes.

- 4) 80% of the respondents have perceived that faculty meetings are always conducted to solve educational problems, whereas 20% often.
- 5) 70% of the respondents have perceived that most of the teachers are always working as hard as they can, in meeting high educational standards, whereas 30% often.
- 6) 70% of the respondents have perceived that all the teachers are never working as hard as they can, in meeting high educational standards, whereas 30% rarely.
- 7) 70% of the respondents have perceived that they always feel some personal responsibility when institutions' goals are not met, 20% often, whereas 10% sometimes.
- 8) 20% of the respondents have perceived that teachers always coordinate among themselves across subject areas, 50% often, 10% sometimes, 10% rarely, whereas 10% never.
- 9) 60% of the respondents have perceived that classes are always conducted regularly and sincerely by the teachers, whereas 40% often.
- 10) 40% of the respondents have perceived that the teachers always have excellent content/method mastery, 30% often, whereas 30% sometimes.
- 11) 30% of the respondents have perceived that internal quality assurance cell is always functional, 40% often, 20% sometimes, whereas 10% never.
- 12) 40% of the respondents have perceived that interdisciplinary research is always promoted, 20% often, 20% sometimes, whereas 20% rarely.
- 13) 50% of the respondents have perceived that institution is always has a healthy and conducive teaching learning environment, 30% often, whereas 20% sometimes.
- 14) 50% of the respondents have perceived that grants are always being utilized optimally, 20% often, 20% sometimes, whereas 10% rarely.
- 15) 40% of the respondents have perceived that institution sometimes contributes in meeting educational development challenges in society, 40% rarely, whereas 10% never.

2. Teaching-Learning Scenario of the Department

- 1) 30% of the respondents have perceived that there is always adequate space for method periods, 40% often, whereas 30% sometimes.
- 2) 80% of the respondents have perceived that the seminars, conferences, workshops conducted are always rich in content, whereas 20% often.

- 3) 60% of the respondents have perceived that simulation is always done scientifically, whereas 40% often.
- 4) 50% of the respondents have perceived that practice teaching is always done scientifically, 30% often, whereas 20% sometimes.
- 5) 40% of the respondents have perceived that innovations are always respected & promoted in Institution, whereas 60% often.
- 6) 50% of the respondents have perceived that publications of faculty are always full of essence, 40% often, whereas 10% sometimes.
- 7) 60% of the respondents have perceived that publications of the Institution are always looked for, whereas 40% often.
- 8) 70% of the respondents have perceived that research guidance is always marvelous in institution, whereas 30% often.
- 9) 20% of the respondents have perceived that there is always adequate focus on mixed research Methodology, 50% often, 20% sometimes, whereas 10% rarely.
- 10) 40% of the respondents have perceived that Institution always provides courses with local & global perspectives, 40% often, whereas 20% sometimes.
- 11) 40% of the respondents have perceived that there are always adequate inputs for realizing holistic education, 40% often, whereas 20% sometimes.
- 12) 20% of the respondents have perceived that the graduates from this institution are always domain leaders globe over, 50% often, whereas 20% sometimes.
- 13) 40% of the respondents have perceived that they constantly work towards improving their classes always, 40% often, whereas 20% sometimes.
- 14) 70% of the respondents have perceived that there always correspondence amongst aims, curricula, mode of transaction & evaluation, whereas 30% often.

15) 70% of the respondents have perceived that there is always access to high quality curriculum material, 20% often, whereas 10% sometimes.

3. Administration in the Department

1) 50% of the respondents have perceived that administration is always trustworthy, 30% often, 10% sometimes, whereas 10% rarely.

2) 50% of the respondents have perceived that all the heads always accept their responsibility for continuous development, 30% often, 10% sometimes, whereas 10% rarely.

3) 70% of the respondents have perceived that Institutional board always looks beyond the current year while making decisions, whereas 30% often.

4) 30% of the respondents have perceived that the staff selection board is always competent & fair, 40% often, 20% sometimes, whereas 10% never.

5) 60% of the respondents have perceived that affiliating body norms, NCTE & UGC norms are always observed, whereas 40% often.

6) 80% of the respondents have perceived that institution always has regular inspections from UGC experts, whereas 20% often.

4. Professional Development of the Teachers

1) 40% of the respondents have perceived that professional development programmes are always well organized, 30% often, whereas 30% sometimes.

2) 60% of the respondents have perceived that faculty always goes out for professional development, whereas 40% often.

3) 70% of the respondents have perceived that faculty always have access to resources to facilitate professional development, whereas 30% often.

4) All the respondents (100%) have perceived that professional development programmes always address the needs of students in their classrooms.

5) 60% of the respondents have perceived that professional development has always been sustained & coherently focused on institutions' goals, 30% often, whereas 10% sometimes.

5. Infrastructural Facilities in the Department

1) 10% of the respondents have perceived that method labs are always fully functional, 30% often, 20% sometimes, 30% rarely, whereas 10% never.

2) 30% of the respondents have perceived that classrooms & halls are always adequate & in healthy state, 10% often, whereas 60% sometimes.

3) 60% of the respondents have perceived that library is always resourceful & user friendly, whereas 40% often.

4) 10% of the respondents have perceived that toilets are always adequate & hygienic, 40% often, 10% sometimes, 30% rarely, whereas 10% never.

5) 40% of the respondents have perceived that parking facilities are proper always, 40% often, whereas 20% sometimes.

6) 20% of the respondents have perceived that canteen is often adequate & hygienic, 40% sometimes, 10% rarely, whereas 30% never.

7) 30% of the respondents have perceived that technological integration is always well observed, 40% often, whereas 30% sometimes.

8) 50% of the respondents have perceived that there are sometimes adequate facilities for to meet students with special needs, 20% rarely, whereas 30% never.

9) 30% of the respondents have perceived that guidance & counseling cell is always functional, 60% sometimes, whereas 10% never.

6. NETWORKING WITH ALUMNI, EDUCATIONAL ORGANIZATIONS & INDUSTRIES

1) 50% of the respondents have perceived that institution always has networking with apex educational agencies & bodies, 40% often, whereas 10% sometimes.

2) 50% of the respondents have perceived that alumni are always well attached irrespective of where they are, whereas 50% often.

3) 60% of the respondents have perceived that Institution always has networking with Industries, whereas 40% often.

B. TEACHER EDUCATION INSTITUTION-2

1. WORKPLACE CULTURE OF THE INSTITUTION

1) 66.7% of the respondents have perceived that the teachers always seek new ideas, whereas 33.3% often.

2) 44.4% of the respondents have perceived that there is always a ongoing collaborative work across subject areas, whereas 55.6% often.

3) All the respondents (100%) have perceived that teachers' ideas are always listened to in the institution.

4) 77.8% of the respondents have perceived that faculty meetings are always conducted to solve educational problems, whereas 22.2% often.

5) 88.9% of the respondents have perceived that most of the teachers are always working as hard as they can, in meeting high educational standards, whereas 11.1% often.

6) 66.7% of the respondents have perceived that all the teachers are sometimes working as hard as they can, in meeting high educational standards, whereas 33.3% rarely.

7) 77.8% of the respondents have perceived that they always feel some personal responsibility when institutions' goals are not met, whereas 22.2% often.

8) 55.6% of the respondents have perceived that teachers always coordinate among themselves across subject areas, whereas 44.4% often.

9) All of the respondents(100%) have perceived that classes are always conducted regularly and sincerely by the teachers.

10) 55.6% of the respondents have perceived that the teachers always have excellent content/method mastery, whereas 44.4% often.

11) 55.6% of the respondents have perceived that internal quality assurance cell is always functional, 33.3% often, whereas 11.1% sometimes.

12) 33.3% of the respondents have perceived that interdisciplinary research is always promoted, 44.4% often, 22.2% sometimes.

13) All of the respondents (100%) have perceived that institution is always has a healthy and conducive teaching learning environment.

14) 66.7% of the respondents have perceived that grants are always being utilized optimally, whereas 33.3% often.

15) 55.6% of the respondents have perceived that institution always contributes in meeting educational development challenges in society, whereas 44.4% often.

2. TEACHING LEARNING SCENARIO OF THE INSTITUTION

1) 55.6% of the respondents have perceived that there is always adequate space for method periods, whereas 44.4% often.

2) 55.6% of the respondents have perceived that the seminars, conferences, workshops conducted are always rich in content, whereas 44.4% often.

3) 88.9% of the respondents have perceived that simulation is always done scientifically, whereas 11.1% often.

4) 88.9% of the respondents have perceived that practice teaching is always done scientifically, whereas 11.1% often.

5) 77.8% of the respondents have perceived that innovations are always respected & promoted in Institution, whereas 22.2% often.

6) 22.2% of the respondents have perceived that publications of faculty are always full of essence, whereas 77.8% often.

7) 22.2% of the respondents have perceived that publications of the Institution are always looked for, whereas 77.8% often.

8) 44.4% of the respondents have perceived that research guidance is always marvelous in institution, 33.3% often, whereas 22.2% sometimes.

9) 33.3% of the respondents have perceived that there is always adequate focus on mixed research methodology, 44.4% often, whereas 22.2% sometimes.

10) 66.7% of the respondents have perceived that Institution always provides courses with local & global perspectives, 22.2% often, whereas 11.1% sometimes.

11) 77.8% of the respondents have perceived that there are always adequate inputs for realizing holistic education, whereas 22.2% often.

12) 22.2% of the respondents have perceived that the graduates from this institution are always domain leaders globe over, 55.6% often, whereas 22.2% sometimes.

13) 66.7% of the respondents have perceived that they constantly work towards improving their classes always, whereas 33.3% often.

14) 44.4% of the respondents have perceived that there always correspondence amongst aims, curricula, mode of transaction & evaluation, whereas 55.6% often.

15) 77.8% of the respondents have perceived that there is always access to high quality curriculum material, whereas 22.2% often.

3. ADMINISTRATION OF THE INSTITUTION

1) 77.8% of the respondents have perceived that administration is always trustworthy, whereas 22.2% often.

2) 55.6% of the respondents have perceived that all the heads always accept their responsibility for continuous development, 33.3% often, whereas 11.1% rarely.

3) 66.7% of the respondents have perceived that Institutional board always looks beyond the current year while making decisions, whereas 33.3% often.

4) 55.6% of the respondents have perceived that the staff selection board is always competent & fair, whereas 44.4% often.

5) 55.7% of the respondents have perceived that affiliating body norms, NCTE & UGC norms are always observed, whereas 44.4% often.

6) 88.9% of the respondents have perceived that institution always has regular inspections from UGC experts, whereas 11.1% often.

4. PROFESSIONAL DEVELOPMENT OF THE TEACHERS

1) 66.7% of the respondents have perceived that professional development programmes are always well organized, whereas 33.3% often.

2) 55.6% of the respondents have perceived that faculty always goes out for professional development, whereas 44.4% often.

3) 55.6% of the respondents have perceived that faculty always have access to resources to facilitate professional development, whereas 44.4% often.

4) All the respondents (100%) have perceived that professional development programmes always address the needs of students in their classrooms.

5) 66.7% of the respondents have perceived that professional development has always been sustained & coherently focused on institutions' goals, whereas 33.3% often.

5. INFRASTRUCTURAL FACILITIES IN INSTITUTION

1) 44.4% of the respondents have perceived that method labs are always fully functional, whereas 55.6% often.

2) 88.9% of the respondents have perceived that classrooms & halls are always adequate & in healthy state, whereas 11.1% often.

3) 77.8% of the respondents have perceived that library is always resourceful & user friendly, whereas 22.2% often.

4) All the respondents (100%) have perceived that toilets are always adequate & hygienic.

- 5) All the respondents (100%) have perceived that parking facilities are proper always.
- 6) 22.2% of the respondents have perceived that canteen is often adequate & hygienic, 55.6% sometimes, whereas 22.2% never.
- 7) All the respondents (100%) have perceived that technological integration is always well observed.
- 8) 55.6% of the respondents have perceived that there are sometimes adequate facilities for to meet students with special needs, whereas 44.4% often.
- 9) 33.3% of the respondents have perceived that guidance & counseling cell is always functional, 66.7% often.

6. NETWORKING WITH ALUMNI, EDUCATIONAL ORGANIZATIONS & INDUSTRIES

- 1) 55.5% of the respondents have perceived that institution always has networking with apex educational agencies & bodies, whereas 44.4% often.
- 2) 33.3% of the respondents have perceived that alumni are always well attached irrespective of where they are, 50% often, whereas 11.1% sometimes.
- 3) 88.1% of the respondents have perceived that Institution always has networking with Industries, whereas 11.1% often.

C. TEACHER EDUCATION INSTITUTION-3

1. WORKPLACE CULTURE OF THE INSTITUTION

- 1) 43% of the respondents have perceived that the teachers always seek new ideas, whereas 57% often.
- 2) 86% of the respondents have perceived that there is always a ongoing collaborative work across subject areas, whereas 14% often.
- 3) 57% of the respondents have perceived that teachers' ideas are always listened to in the institution, whereas 43% often.

- 4) All the respondents (100%) have perceived that faculty meetings are always conducted to solve educational problems.
- 5) 71% of the respondents have perceived that most of the teachers are always working as hard as they can, in meeting high educational standards, whereas 29% often.
- 6) 43% of the respondents have perceived that all the teachers are sometimes working as hard as they can, in meeting high educational standards, whereas 57% rarely.
- 7) 42% of the respondents have perceived that they always feel some personal responsibility when institutions' goals are not met, 29% often, whereas 29% sometimes.
- 8) 29% of the respondents have perceived that teachers always coordinate among themselves across subject areas, 14% often, 43% rarely, whereas 14% never.
- 9) All of the respondents (100%) have perceived that classes are always conducted regularly and sincerely by the teachers.
- 10) All of the respondents (100%) have perceived that the teachers always have excellent content/method mastery.
- 11) 14% of the respondents have perceived that internal quality assurance cell is always functional, 43% often, whereas 43% sometimes.
- 12) 29% of the respondents have perceived that interdisciplinary research is always promoted, 14% often, 43% sometimes, whereas 14% rarely.
- 13) 14% of the respondents have perceived that institution is always has a healthy and conducive teaching learning environment, 29% often & whereas 57% never.
- 14) 14% of the respondents have perceived that grants are always being utilized optimally, whereas 86% often.
- 15) 29% of the respondents have perceived that institution always contributes in meeting educational development challenges in society, 14% sometimes, whereas rest no response.

2. TEACHING LEARNING SCENERIO OF THE INSTITUTION

- 1) 14% of the respondents have perceived that there is always adequate space for method periods, 29% often, whereas 57% sometimes.
- 2) 14% of the respondents have perceived that the seminars, conferences, workshops conducted are often rich in content, whereas 86% sometimes.
- 3) 29% of the respondents have perceived that simulation is always done scientifically, whereas 71% often.
- 4) All the respondents (100%) have perceived that practice teaching is always done scientifically,
- 5) 43% of the respondents have perceived that innovations are always respected & promoted in Institution, 14% often, whereas 43% sometimes.
- 6) 14% of the respondents have perceived that publications of faculty are always full of essence, whereas 86% often.
- 7) 29% of the respondents have perceived that publications of the Institution are often looked for, 42% sometimes, whereas 29% rarely.
- 8) 43% of the respondents have perceived that research guidance is often marvelous in institution, 14% rarely, whereas 43% never.
- 9) All of the respondents have perceived that there is often adequate focus on mixed research methodology.
- 10) 43% of the respondents have perceived that Institution always provides courses with local & global perspectives, 43% often, whereas 14% sometimes.
- 11) 29% of the respondents have perceived that there are always adequate inputs for realizing holistic education, 14% often, whereas 57% sometimes.
- 12) 14% of the respondents have perceived that the graduates from this institution are always domain leaders globe over, 14% often, whereas 58% never.

13) 29% of the respondents have perceived that they constantly work towards improving their classes always, 57% sometimes, whereas 14% often.

14) 29% of the respondents have perceived that there always correspondence amongst aims, curricula, mode of transaction & evaluation, whereas 71% often.

15) 86% of the respondents have perceived that there is always access to high quality curriculum material, whereas 14% often.

3. ADMINISTRATION IN INSTITUTION

1) 29% of the respondents have perceived that administration is always trustworthy, 14% often, 43% sometimes, whereas 14% rarely

2) 14% of the respondents have perceived that all the heads always accept their responsibility for continuous development, 29% often, 14% sometimes, whereas 43% rarely.

3) 43% of the respondents have perceived that Institutional board always looks beyond the current year while making decisions, 43% often, whereas 14% sometimes.

4) 44% of the respondents have perceived that the staff selection board is always competent & fair, 14% often, 14% sometimes, 14% rarely, whereas 14% never

5) 29% of the respondents have perceived that affiliating body norms, NCTE & UGC norms are often observed, 14% sometimes, whereas 57% never.

6) 29% of the respondents have perceived that institution always has regular inspections from UGC experts, whereas 71% often.

4. PROFESSIONAL DEVELOPMENT OF TEACHERS

1) 43% of the respondents have perceived that professional development programmes are always well organized, 14% often, whereas 43% never.

2) 29% of the respondents have perceived that faculty always goes out for professional development, 29% often, whereas 42% sometimes.

- 3) 29% of the respondents have perceived that faculty always have access to resources to facilitate professional development, 29% often, whereas 42% sometimes
- 4) 57% of the respondents have perceived that professional development programmes always address the needs of students in their classrooms, whereas 43% often.
- 5) 43% of the respondents have perceived that professional development has always been sustained & coherently focused on institutions' goals, 29% often, whereas 29% sometimes.

5. INFRASTRUCTURAL FACILITIES IN THE INSTITUTION

- 1) 14% of the respondents have perceived that method labs are always fully functional, whereas 14% often, 44% sometimes, 30% rarely, whereas 14% never.
- 2) 14% of the respondents have perceived that classrooms & halls are always adequate & in healthy state, whereas 86% often.
- 3) 29% of the respondents have perceived that library is always resourceful & user friendly, whereas 71% often.
- 4) 57% of the respondents have perceived that toilets are always adequate & hygienic, whereas 43% often.
- 5) 29% of the respondents have perceived that parking facilities are proper always, 71% often.
- 6) 43% of the respondents have perceived that canteen is often adequate & hygienic, 43% sometimes, whereas 14% rarely.
- 7) 43% of the respondents have perceived that technological integration is always well observed, whereas 57% rarely.
- 8) 29% of the respondents have perceived that there are often adequate facilities for to meet students with special needs, 57% sometimes, whereas 14% rarely.
- 9) 43% of the respondents have perceived that guidance & counseling cell is often functional, 57% rarely.

6. NETWORKING WITH ALUMNI, EDUCATIONAL INSTITUTIONS & INDUSTRIES

1) 29% of the respondents have perceived that institution often has networking with apex educational agencies & bodies, 14% often, whereas 57% never.

2) 14% of the respondents have perceived that alumni are always well attached irrespective of where they are, whereas 86% often.

3) 43% of the respondents have perceived that Institution always has networking with Industries, whereas 57% often.

D. COMPARITIVE STUDY OF THE TQM OF ALL THE THREE INSTITUTIONS

TABLE 1: WORK CULTURE OF THE INSTITUTIONS

Institutions	Always	Often	Sometimes	Rarely	Never
Institute of Education-1	43.33%	29.33%	12.66%	7.33%	7.33%
Institute of Education-2	65.18%	25.90%	6.60%	2.20%	0
Institute of Education-3	48.57%	23.80%	11.40%	7.61%	4.76%

It is evident from **Table 1** that, of the three Institutions, Institution -2 has got the best (i.e. always 65.18% & often 25.90%), next in the sequence are the Institute-1 (i.e. always 43.33% & often 29.33%) and Institute-3 (i.e. always 48.57% & often 23.80%).

TABLE 2: TEACHING LEARNING SCENERIO OF THE INSTITUTION

Institutions	Always	Often	Sometimes	Rarely	Never
Institute of Education-1	49.33%	38.66%	11.33%	0.66%	0
Institute of Education-2	56.29%	38.51%	5.18%	0	0
Institute of Education-3	28.57%	36.14%	23.18%	2.85%	3.80%

It is evident from **Table 2** that, of the three Institutions, Institute-2 has got the best Teaching Learning Scenario (i.e. always 59.29% & often 38.51%), next in the sequence are the Institute-1 (i.e. always 49.33% & often 38.66%) and Institute-3 (i.e. always 28.57% & often 36.14%).

TABLE 3: ADMINISTRATION OF THE INSTITUTION

Institutions	Always	Often	Sometimes	Rarely	Never
Institute of Education-1	56.66%	31.66%	6.66%	3.33%	1.66%
Institute of Education-2	66.66%	31.48%	0	1.86%	0
Institute of Education-3	26.19%	33.33%	14.28%	14.28%	11.90%

It is evident from **Table 3** that, of the three Institutions, Institute-2 has got the best Administration (i.e. always 66.66% & often 31.48%), next in the sequence are Institute-1 (i.e. always 56.66% & often 31.66%) and Institute-3 (i.e. always 26.19% & often 33.33%).

TABLE 4: PROFESSIONAL DEVELOPMENT OF THE TEACHERS

Institutions	Always	Often	Sometimes	Rarely	Never
Institute of Education-1	66.00%	26.00%	8.00%	0	0
Institute of Education-2	69.00%	31.00%	0	0	0
Institute of Education-3	20.00%	34.28%	20.00%	17.14%	8.57%

It is evident from **Table 4** that, of the three Institutions, Institution-2 has got the best Professional Development of Teachers (i.e. always 69.00% & often 31.00%), next in the sequence are Institution-1 (i.e. always 66.00% & often 26.00%) and Institution-3 (i.e. always 20.00% & often 34.28%).

TABLE 5: INFRASTRUCTURAL FACILITIES IN THE INSTITUTION

Institutions	Always	Often	Sometimes	Rarely	Never
Institute of Education-1	23.33%	24.44%	32.22%	10.00%	10.00%
Institute of Education-2	66.67%	24.69%	6.17%	0	2.47%
Institute of Education-3	15.87%	49.20%	12.69%	20.64%	1.60%

It is evident from **Table 5** that, of the three Institutions, Institute-1 has got the best Infrastructural facilities (i.e. always 66.67% & often 24.69%), next in the sequence are the Institution-2(i.e. always 15.87% & often 49.20%) and Institute-3 (i.e. always 23.33% and 24.44%)

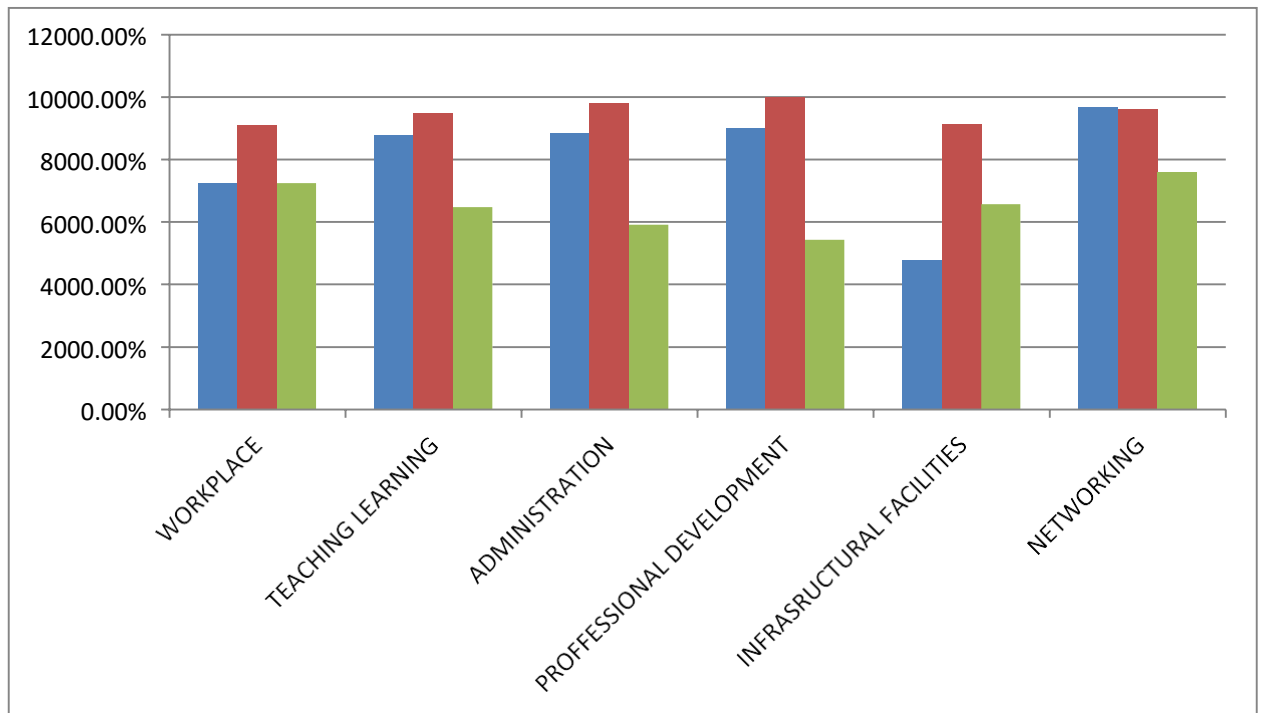
TABLE 6: NETWORKING WITH THE ALUMNI, EDUCATIONAL ORGANIZATIONS AND INDUSTRIES

Institutions	Always	Often	Sometimes	Rarely	Never
Institute of Education-1	53.33%	43.33%	3.34%	0	0
Institute of Education-2	59.25%	37.05%	3.70%	0	0
Institute of Education-3	19.05%	57.15%	4.76%	0	19.04%

It is evident from **Table 5** that, of the three Institutions, Institute-1 has got the best Networking with the alumni, educational organizations and industries (i.e. always 53.33% & often 43.33%), next in the sequence are the Institute-2 (i.e. always 59.25% & often 37.05%) and Institute-3 (i.e. always 19.05% & often 57.15%).

EMERGING SCENARIO

- 1) Workplace Culture, Teaching Learning Scenario, Administration, and Professional Development of the Institute-2 have been found to be greatest amongst the three institutions, whereas, next in the sequence are Institute-1, and then Institute-3.
- 2) Infrastructural facilities have been found to be higher in both the Private Teacher Education Institutions as compared to the Public Institution.
- 3) Networking has been found to be greater in the Public Institution than that of both the Private Teacher Education Institutions.



IMPLICATIONS OF THE PRESENT STUDY

- 1) There is a need to improve upon the work culture of both the Public & Private Teacher Education institutions.
- 2) There is a need to develop healthy Teaching –Learning Scenario.
- 3) There should be due focus on the Professional Development of Teachers of both the Public & Private Teacher Education Institutions
- 4) There is an immediate need to enhance the infrastructural facilities in the Teacher Education Institutions, more so in the Public Institutions.
- 5) All the Teacher Education Institutions ought to have complete networking.
- 6) There should be networking with the other institutions, educational agencies, industries and community as a whole. Teacher Education Institutions must be aware of & develop the skills the schools need.
- 7) Teacher Education Institutions must be accountable for the quality of education they are providing.

CONCLUSION

Total Quality Management of Indian Teacher Education is a matter of immediate concern. There is a need to enhance the work culture of the Teacher Education Institutions in terms of all the parameters of the Education System- Input, Process & Output. Teacher Education Capacity & Throughput Dichotomy should be resolved. There should be no Public & Private Dichotomy in Teacher Education norms. There is an immediate need to enhance the administration, infrastructure, work culture, teaching learning scenario, and networking of the Teacher Education Institutions. Dedicated strategies should be employed for the development of Quality Teacher Education Institutions.

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SCIENCE EDUCATION FOR WHOLISTIC DEVELOPMENT OF TEACHERS

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ABSTRACT

The paper explores the possible role of Science Education for wholistic development of teachers. It opens up with the intent of Science to have a comprehensive knowledge base, though the approach is atomistic. It presents wholistic approach, wholistic education and wholistic science education. It culminates into Wholistic Development of Teachers through an illustration on Tea preparation concluding that, though atomistic, the ultimate aim of Science is to have a comprehensive knowledge base of the entire universe to facilitate healthy, happy, full and meaningful life in resonance with all.

INTRODUCTION

Science explores and art expresses. Science intends to reveal the whole in an interrelated atomistic way. The drive of Science is to move from dot to globe, from elements to compounds, from disciplinary to interdisciplinary, from point to morphology. Occurrence of any phenomenon, however, big or small is wholistic, such as, flying of birds, constellation and movements of the celestial bodies, evaporation of water and rainfall, viscosity and surface tension, electric discharge between clouds and thunder, chemical reactants, products and equation, osmosis and reverse osmosis, conservation of mass and momentum, and heart and brain entrainment. Science tends to have wholistic understanding of the interrelation, correlation & cause and effect relation of perceptible variables. There is an inherent move from constructivism to connectionism and wholism. We need to learn to appreciate the beauties of Science with universal positivism.

NCERT Focus Group (2005) highlights that Science Education should enable the learner to know the facts and principles of science and its applications, to acquire the skills and understand the methods and processes that lead to generation and validation of scientific knowledge, to develop a historical and developmental perspective of science and to enable the learner to view science as a social enterprise, to relate to the environment, local, as well as, global, and appreciate the issues at the interface of science, technology and society, to nurture the natural curiosity, aesthetic sense and creativity in science and technology, to imbibe the values of honesty, integrity, co-operation, concern for life and preservation of environment and to cultivate 'scientific temper'-objectivity, critical thinking and freedom from fear and prejudice. Thus, science education is to develop human beings for peaceful coexistence in the world.

Teachers are the very important stakeholder of the society, because teachers can lead community and nation towards better and fruitful life. Teaching is a profession and teacher education is a process of professional preparation of teachers. Teachers are concerned, in an important way, with the total development of human beings – physical, intellectual, emotional, social, moral and spiritual. Teacher quality is a function of several factors: teachers' status, remuneration, conditions of work and their academic and professional education. The teacher education system through its initial and continuing professional development programmes is expected to ensure an adequate supply of professionally competent teachers to run the nation's schools. Initial teacher education especially, has a major part to play in the making of a teacher. It marks the initiation of the novice entrant to the calling and as such has tremendous potential to imbue the would-be teacher with the aspirations, knowledge-base, repertoire of pedagogic capacities and humane attitudes. (NCFTE, 2009)

Here the focus is developing humane and professional teacher through wholistic science education.

Wholistic Education

Huie (2010) outlined the components of Wholistic education, such as, active learning, deep understanding, critical and creative thinking, along with an emphasis on social relationships and realising the fullness of human existence. Wholistic education is a philosophy of education and concerned with the development of every person's intellectual, emotional,

social, physical, and spiritual potentials. Report of Kothari commission (1964-66) has recommended cultivating social, moral and spiritual values as one of the important aims of Education. Further, Miller (1999) has been of the view that “Wholistic Education is based on the premise that each person finds identity, meaning and purpose in life through connections to the community, to the natural world, and to spiritual values, such as, compassion and peace.” The wholistic education places significance on relationships and primary human values within the learning environment (Martin, 2003).

Martin & Forbes (2004) divided wholistic education into two categories: the idea of Ultimacy and Basil Bernstein’s notion of Sagacious Competence.

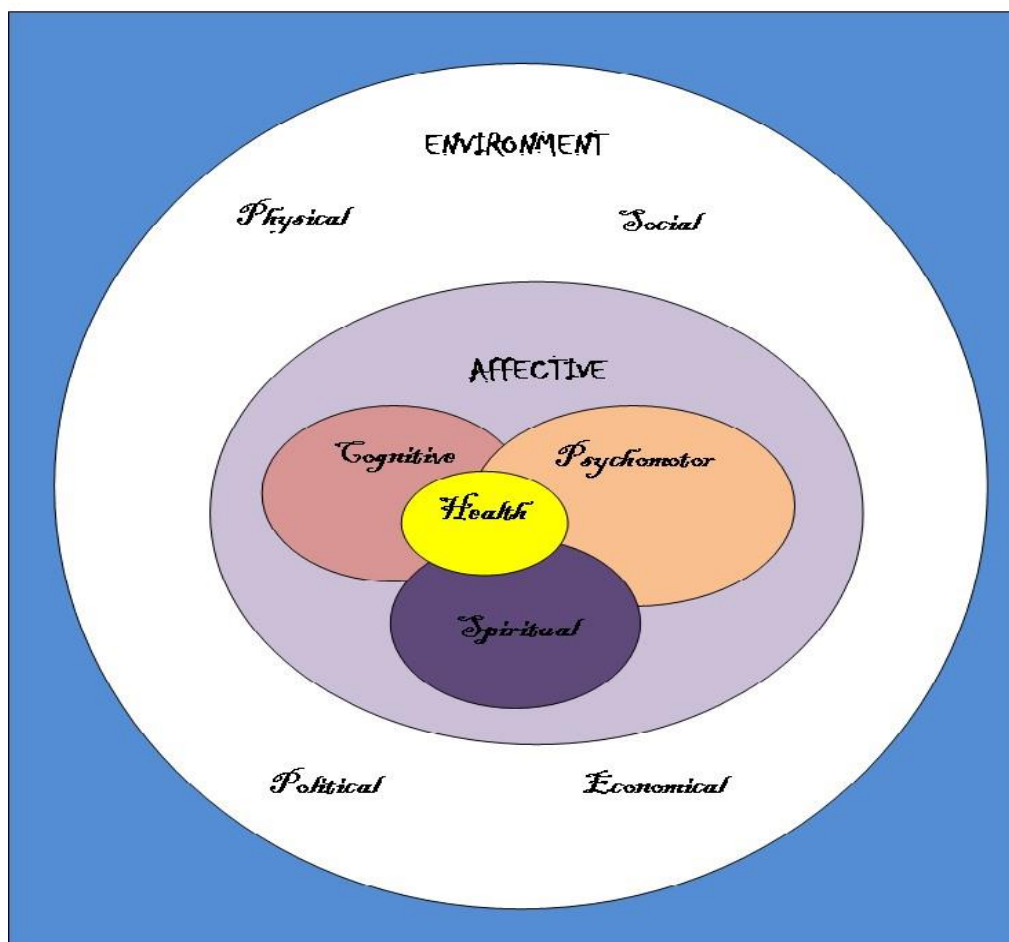
Wholistic Approach

Concept of wholistic approach is that the totality of something is much greater than the sum of its component parts and their functioning i.e. the whole cannot be understood by the isolated analysis of its parts, their nature, structure and function rather the whole is integrated functioning of all the parts with interrelation & interdependence. The wholistic approach is approach, such as, Naturalistic, Constructivist & Connectionist. Wholistic approach is way of teaching a subject as a whole by considering all aspects of the curriculum tending towards wholistic. It is interdisciplinary disciplinary approach dealing in integration of content within & between subjects. The content caters to cognitive, affective, psychomotor, and spiritual domains in resonance with the environment. The wholistic approach focuses on the integrated development of all the domains, that is, all round development. The wholistic approach enables students to explore their own potential and that of surroundings in an integrated way.

Maheshwari (2010) has defined holistic approach as an essential element to educating students which one seeks to open the mind, awaken the heart and nurture the spirit. Key concepts of such an approach include fostering a passion for learning and nourishing the sense of wonder. Holistic Approach is one where the education is going beyond narrow focus on the intellect, transcending space, time, matter and mind.

Wholistic approach can be presented through Venndiagram:

U



Wholistic Approach of Science Education

Wholistic approach deals with all the domains, such as, cognitive, affective, psychomotor, health and environment, and spiritual. Science is a discipline where students learn many laws which are related to the universe. In the study of Science students are doing practical and by that they can experience success and failure. The aim of wholistic education is developing student as a whole. While exploring & gaining knowledge through the wholistic approach, the curriculum is such that it takes care of development of all the domains. Through the Science subject, development of affective domain is done because in curriculum there are so many topics related to self, relationship, health and environment. The students are able to learn and feel the environment. All the domains, such as, Health-Intelligence-Emotional-Spiritual- Environmental-Metaphysical can be developed through Science, both, Natural & Social, wholistically.

Development of Humane and Professional Teachers through Wholistic Science Education

Professional and Humane qualities are required in teachers, such as, Research & Knowledge, Interest, Value & Attitude, Truthfulness, Compassion & Forbearance, Skill-Scale & Speed, Communication, Innovation-Creation-Construction & Connection, Dedication & Identification, Determination & Action, Empathy & Adjustment, Curiosity-Quest & Immersion, Engagement & Passion, Generosity & Authority, Yoga & Control, Motivation & Inspiration, Sensitivity & Search, Deviation & Resilience, Freedom & Control, Courage & Patience, Leadership, Administration, Organization & Management, Openness & Positivity, be-becoming-being & de-becoming, Having & Being, Production & Evolution, Above all a teacher ought to be essentially researcher, innovator, creator, connector, communicator, approachable, open, impartial & judicious intellectual. The Text of a Teacher ought to have its own testimony. Science is our extension -Radio is extension of Voice, Television is extension of Visual, Computer is extension of Brain, Motor Bike is extension of our Feet, whereas, Cloths are extension of our Skin. Science plays tremendous role in human life. Man has been able to transcend time and space with the help of Science. Science facilitates life and living. Science tends to know the universe. Science has the attributes of recency, omnipresence and immediacy. Wholistic science education deals with all the aspects of the universe. Ultimate aim of Science Education is development of universal beings.

Wholistic Development of Teachers -An illustration on Tea Preparation

Introduction

Here is a lesson on Tea preparation employing Wholistic Approach of Science Education.

Inputs

For preparation of tea there is a need to gather all the apparatus and ingredients required for the tea preparation, such as, Pan, Milk, Water, Gas stove/Kerosene stove/ Electric coil/ Induction gas, Lighter, Match box, Pair of tongs/ Cloths used for handling hot pan, Tea leaves container/Tea bags container, Sugar container/Sugar Free Tablets Container, Basil, Eliachi (Cardamom), Ginger, Black Pepper, Sieve, Tea pot, Cup and Saucer/ Tea Mug. Edible materials used in preparation of tea are, such as, Water, Dry Tea Leaves, Ginger, Cardamom, Black Pepper, Basil, Pudina, Green Tea Leaves, Sugar.

Process

After collecting all the ingredients and apparatus for preparation of tea, there is need to exercise choice for pan. After that drinking water is collected. Then the gas is burnt with the help of lighter/match box. There is need to regulate the desired volume of the flame. After boiling water, it's time to add dry tea leaves, basil, grated ginger, black pepper, green tea leaves, Pudina and cardamom. After extraction of these things there is need to add sugar and milk. Boil for some time and pour it in tea pot, serve it in cups and enjoy Tea. This is the simple recipe for Tea.

Emerging Questions

1. What ought to be the characteristics of the Pan used for tea preparation?
2. What is the chemical composition of all the ingredients used in preparation of tea?
3. Why water for extraction of ingredients?
4. What is the chemical composition of the various materials?
5. What are the contents of the prepared tea?
6. What is TEA as a whole & what for?

Properties of materials and ingredients

a) Properties of Metals

1. Metals, in their pure state, have a shining surface. This property is called metallic lustre.
2. Metals are generally hard. The hardness varies from metal to metal. They are solids at room temperature, except mercury which is a liquid.
3. Some metals can be beaten into thin sheets. This property is called malleability. Gold and silver are the most malleable metals
4. The ability of metals to be drawn into thin wires is called ductility. Gold is the most ductile metal.
5. Because of their malleability and ductility metals can be given different shapes according to our needs.
6. Metals are good conductors of heat and have high melting points. The best conductors of heat are silver and copper. Lead and mercury are comparatively poor conductors of heat.
7. Metals can form positive ions by losing electrons to non-metals.

8. Metals combine with oxygen to form basic oxides. Aluminium oxide and zinc oxide show the properties of both basic as well as acidic oxides. These oxides are known as amphoteric oxides.
9. The pan should be optimum in size. Handle of Material of Pan should be made from non-conducting, this is insulating material. Most of the pan handles are made from asbestos.
10. Pan metal should be such which cannot easily peel, crack, vaporize, dissolve or harbor bacteria. It should be a good conductor of heat in order to cook food uniformly, and it should be easy to clean thoroughly. Alloy can be used for best result because it has good quality of more than one metal.

b) Water

Water is the most abundant compound on Earth's surface, covering about 70 percent of the planet. In nature, water exists in liquid, solid, and gaseous states.

Density: 1,000.00 kg/m³

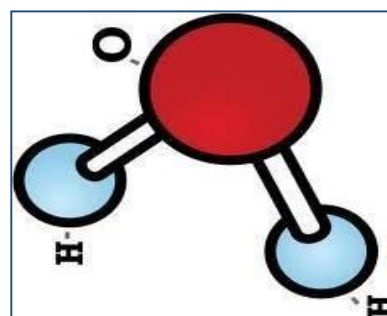
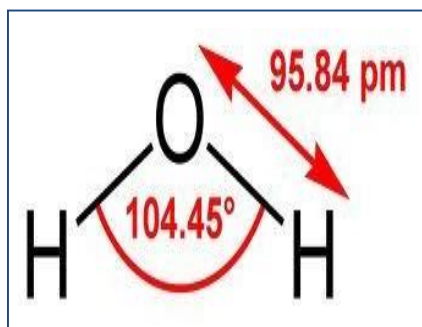
Molar mass: 18.01528 g/mol

Boiling point: 99.98 °C

Formula: H₂O

Melting point: 0.0 °C

IUPAC NAME: Dihydrogen oxide



Water is a tasteless, odorless liquid. At ambient temperature and pressure, it appears colourless in small quantities, although it has its own intrinsic very light blue hue. Water has pH 7.

c) Milk

The constituents of milk are water, lipids, carbohydrates, proteins, vitamins and minerals.

- Water:

This constitutes about 85-87% of milk. This is the main medium for the suspension of all other components.

- **Lipids:**

Milk is an emulsion and the lipids are found in a globular form. The main lipids present in milk are triglycerides, phospholipids and cholesterol. The triglycerides are formed of a number of fatty acids, such as, palmitic acid, stearic acid, lauric acid, and linolic acid. Lecithin, Cholin and many cerebrosides are other forms of fats present in milk. The percentage of fats in milk varies in different breeds; it may vary from 3.5-5%.

The fatty substances in milk can be separated in a solid form by applying centrifugal force after it is allowed to get curdled. Butter, the concentrated fat of milk is an important food ingredient in human diet. Ghee is another product obtained by melting the butter.

- **Carbohydrates:**

The most important carbohydrate present in milk is lactose. It is commonly called milk sugar. Lactose is a disaccharide formed of two monomeres of monosaccharides-glucose and galactose.

- **Protein:**

Among the proteins, casine commonly called the milk protein is the most important constituent. In milk, casine combines with calcium forming calcium caseinate. For growing children casine is a very essential protein. Other proteins of milk include lactoalbumins and lactoglobulins.

- **Vitamins and minerals:**

Milk contains a number of essential mineral elements such as sodium, potassium, calcium, magnesium, iron, copper, iodine etc. Among the vitamins, milk has B complex and vitamin C and A. Even vitamin D and E are present in milk.

How milk is wholesome diet

Milk contains calcium, vitamin A, vitamin B12, iodine, riboflavin, potassium, magnesium, zinc, phosphorus, carbohydrate and high quality protein. These components make Milk a wholesome diet.

Properties of Milk (Colloidal Solution)

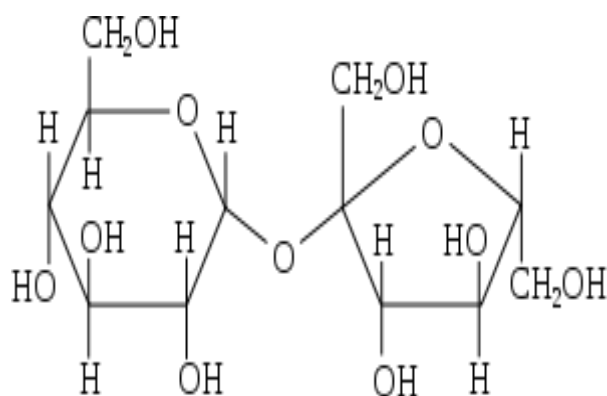
1. Milk is a colloidal solution. A colloid is a heterogeneous mixture.
2. The particles of a colloid are uniformly spread throughout the solution. Due to the relatively smaller size of particles the mixture appears to be homogeneous.
3. But actually, a colloidal solution is a heterogeneous mixture. Because of the small size of colloidal particles, we cannot see them with naked eyes. But, these particles can easily scatter a beam of visible light. This scattering of a beam of light is called the Tyndall effect.
4. They do not settle down when left undisturbed, that is, a colloid is quite stable.

d) Sugar

Sugar is also known as sucrose. Natural source of sucrose are beetroot and sugarcane. Sucrose is a disaccharide constituent of glucose and fructose. During the process of digestion by sucrose enzyme sucrose split into monosaccharide namely, glucose and fructose. Sugar (sucrose) found in two form i.e. powder and crystalline.

Molecular Formula of sucrose: $C_{12}H_{22}O_{11}$

Structural Formula:



Sucrose

Sugar Free Powder/ Tablet

Sugar Free is a substitute of sugar for diet. Sugar free is used as artificial sweetening agents which are stevia, aspartame, sucralose, neotame, acesulfame potassium, and saccharin. Sugar Free found in different forms i.e. tablet, powder and liquid. Sugar Free is very much useful for diabetic patient and calorie conscious people.

e) Tea leaves

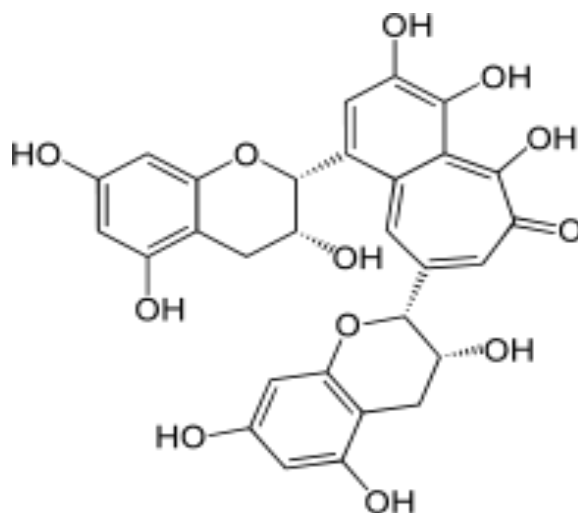
Compounds presents in tea leaves are polyphenols, amino acids, enzymes, pigments, carbohydrates, methylxanthines, minerals and many volatile flavor and aromatic compounds which give aroma, flavor, and taste to tea.

1. Polyphenols

Polyphenols are largely responsible for astringency. There are an estimated 30,000 polyphenolic compounds in tea, flavonoids are arguably the most important group of polyphenols in tea and are the source of the many health claims surrounding tea, and specifically tea antioxidants. A strong cup of tea contains around 180-240 mg of polyphenol compounds.

2. Flavanols

Flavanols are also referred to as tannins, and during oxidation are converted to theaflavins and thearubigins—the compounds responsible for the dark color and robust flavors notably present in black tea. The major flavanols in tea are: catechin (C), epicatechin (EC), epicatechingallate (ECG), galocatechin (GC), epigallocatechin (EGC), and epigallocatechingallate (EGCG). EGCG is the most active of these catechins and is often the subject of studies regarding tea antioxidants. Tea flavanols are sometimes collectively referred to as catechins. Besides flavanols, tea flavonoids also include flavonols, flavones, isoflavones, and anthocyanins; all of which contribute to the color of a tea's infusion and its taste.



Theaflavin

3. Amino Acids

Tea leaves contain many amino acids, the most abundant of which is theanine. Theanine, more specifically L-Theanine is responsible for promoting alpha brain wave activity which promotes relaxation. L-Theanine in concert with caffeine can induce a state of “mindfulness” in the tea drinker.

4. Enzymes

Polyphenol oxidase and peroxidase are the most important enzymes in tea leaves. They are responsible for the enzymatic browning of tea leaves that takes place when the cell walls in the leaves are broken and the polyphenols are exposed to oxygen – otherwise known as oxidation.

5. Methylxanthines

Methylxanthines in tea include the stimulant caffeine and two similar compounds: theobromine and theophylline. Methylxanthines also contribute to a bitter taste.

Composition of a black tea beverage

Substance	% dry weight
Epi-galloctechingallate	4.6
Epi-galloctechin	1.1
Epi-atechingallate	3.9
Epi-atechin	1.2
Flavonolglycosides	trace
Bisflavanols	trace
Theaflavins	2.6
Theaflavic acid	trace
Thearbigins	35.9
Caffeine	7.6
Theobromine	0.7
Theophylline	0.3
Galic acid	1.2
Chlorogenic acid	0.2
Oxalic acid	1.5
Malonic acid	0.02
Succinic acid	0.1
Malic acid	0.3
Acetic acid	0.01
Citric acid	0.8
Lipids	4.8
Monosaccharides	6.9
Pectin	0.2
Polysaccharides	4.2
Peptides	6.0
Theanine	3.6
Other amino acids	3.0
Potassium	4.8
Other minerals	4.7
Volatiles	0.01

Adapted from Graham (1984)

Effect of Milk on Polyphenols present in Tea

The compounds in Tea derived from catechins can have antioxidant effects on the body, these could have beneficial effects on cardio vascular health. Casein proteins in milk could bind to polyphenols and as a result prevent their antioxidant effects.

f) Medicinal uses of different herbs used in preparation of tea

1. Name: Ginger

Scientific Name: *Zingiberofficinale*

It is used in preparation of tea to prevent morning sickness, motion sickness, and nausea that accompanies gastroenteritis.

2. Name: Cardamom

Scientific Name: *Elettariacardamomum*

It is used in preparation of tea to prevent infections in teeth and gums, to prevent and treat throat troubles, congestion of the lungs as well as Flavoring agent.

3. Name: Basil

Scientific Name: *Ocimumtenuiflorum*

It is used in preparation of tea as Healing Power, Fever & Common Cold, Coughs, Sore Throat, Respiratory Disorder, Mouth Infections, and Headaches.

4. Name: Black Pepper

Scientific Name: *Piper Nigrum*

It is used in preparation of tea to improve digestion, stimulate appetite, and treat gastrointestinal problems, including diarrhea, dyspepsia and flatulence. It is also used to treat colds, coughs and sore throats.

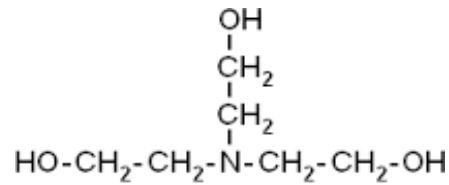
5. Name: Pudina

Scientific Name: *MenthaArvensis*

It is used in preparation of tea for treatment of vomiting and nausea. It is also useful for stomach disorders and as antiseptic.

g. Chemical Composition of various ingredients used in TEA preparation

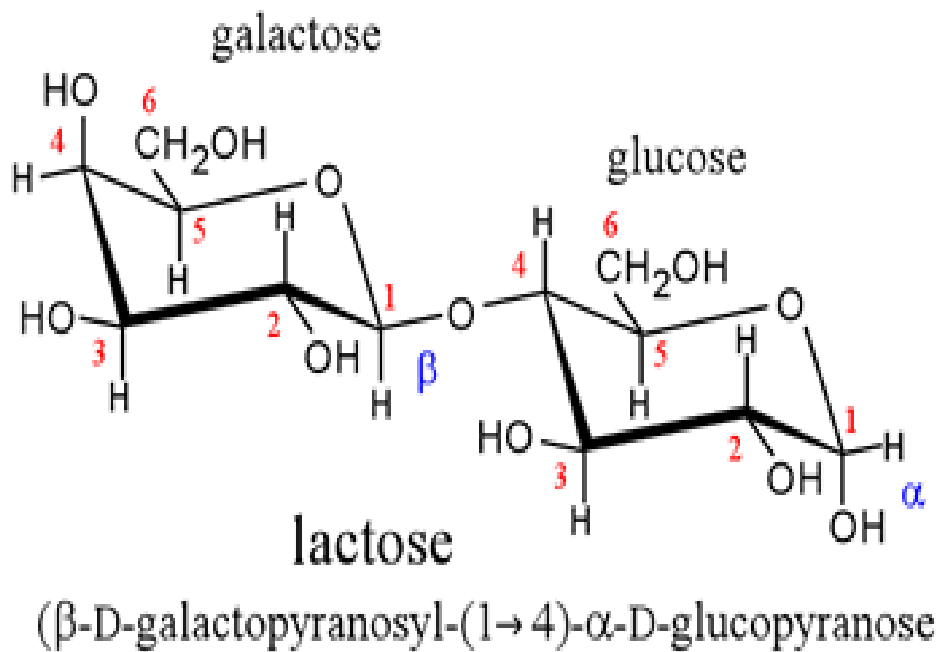
1. TEA (TRIEETHANOLAMINE)



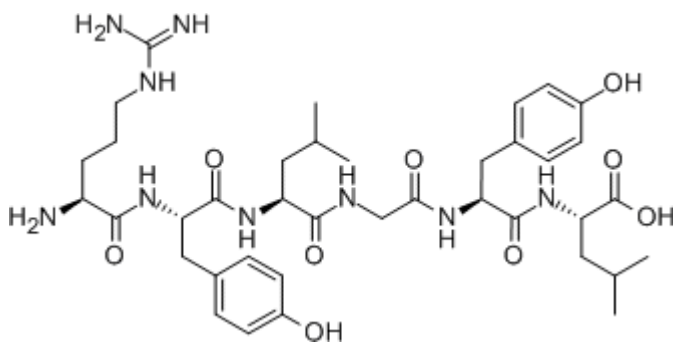
triethanolamine (TEA)

2. MILK

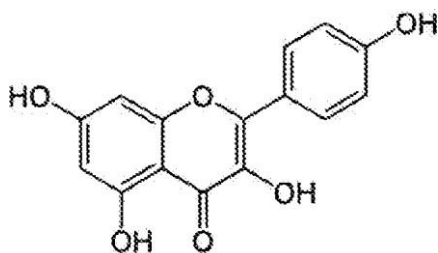
Milk contains mainly Lactose , Casein and Water



3. CASEIN



4. BASIL



Basil (*Ocimum basilicum*), also known as Saint Joseph's Wort, is a herb belonging to the mint family *Lamiaceae* often used as a seasoning in cooking. Basil is native to India and other tropical areas of Asia.

This MNT Knowledge Center feature is part of a collection of articles about the health benefits of popular foods. It highlights the potential health benefits of consuming basil and provides a nutritional profile for the herb.

The herb is well known for its use in Italian cuisine - it is a major ingredient in pesto sauce. Basil is also commonly used Indonesian, Thai, and Vietnamese cuisine.

According to the *International journal of Agronomy and Plant Production*, the word Basil derives from the Greek word "*basileus*", which means "king". The Oxford English Dictionary says that basil may have been used as "some royal unguent, bath, or medicine".

In fact, there are quite a number of different beliefs associated with the herb. The French often refer to the herb as *l'herberoyale* (the royal herb), and in Jewish folklore basil is thought to give strength while fasting.

Basil is used in traditional Tamil medicine and in ayurvedic medicine, which is a form of alternative traditional medicine in the Indian subcontinent.

There are different types of basil, which differ in taste and smell. Sweet basil (the most commercially available basil used in Italian food) has a strong clove scent because of its high concentration of the chemical agent eugenol. Whereas lime and lemon basil have a strong citrus scent due to their high concentration of limonene.

Health benefits of basil

Research indicates that there are several health benefits associated with basil.

A study by researchers at Purdue University revealed that basil "contains a wide range of essential oils rich in phenolic compounds and a wide array of other natural products including polyphenols such as flavonoids and anthocyanins."

The herb contains high quantities of (E)-beta-caryophyllene (BCP), which may be useful in treating arthritis and inflammatory bowel diseases, according to research conducted at the Swiss Federal Institute of Technology.



Reduce inflammation and swelling - a study presented at the Royal Pharmaceutical Society's annual event, revealed that "extracts of *O. tenuiflora* (Holy basil) were shown to reduce swelling by up to 73%, 24 hours after treatment".

Anti-aging properties - according to research presented at the British Pharmaceutical Conference (BPC) in Manchester, basil has properties that can help prevent the harmful effects of aging. Holy basil extract was effective at killing off harmful molecules and preventing damage caused by some free radicals in the liver, brain and heart.

Rich in antioxidants - results of a study published in the *Journal of Advanced Pharmacy Education & Research* showed that ethanol extract *Ocimum basilicum* had more antioxidant activity than standard antioxidants.

Nutritional profile for basil

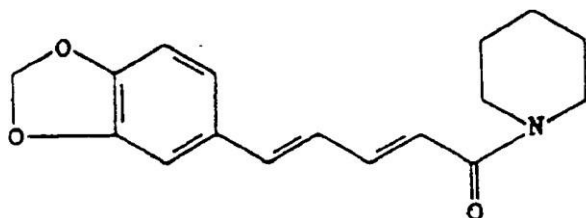
Basil is rich in vitamin A, vitamin K, vitamin C, magnesium, iron, potassium, and calcium.

Nutritional value of basil per 100 g (3.5 oz)

Energy - 94 kJ (22 kcal)	Carbohydrates - 2.65 g
Dietary fiber - 1.6 g	Fat - 0.64 g
Protein - 3.15 g	Water - 92.06 g
Vitamin A - 264 µg	Thiamine - 0.034 µg
Riboflavin - 0.076 mg	Niacin - 0.902 mg
Vitamin B ₆ - 0.155 µg	Folate - 68 µg
Choline - 11.4 mg	Vitamin C - 18.0 mg
Vitamin E - 0.80 mg	Vitamin K - 414.8 µg
Calcium - 177 mg	Iron - 3.17 mg
Magnesium - 64 mg	Manganese - 1.148 mg
Phosphorus - 56 mg	Potassium - 295 mg
Sodium - 4 mg	Zinc - 0.81 mg

Source: *USDA Nutrient Database*

BLACK PEPPER



1-[5-(1,3-Benzodioxol-5-yl)-1-oxo-2,4-pentadienyl]piperidine

The health benefits of black pepper include relief from respiratory disorders, coughs, the common cold, constipation, indigestion, anemia, impotency, muscular strains, dental disease, pyorrhea, diarrhea, and heart disease.

Black Pepper is the fruit of the black pepper plant from the *Piperaceae* family and is used as both a spice and a medicine. The chemical piperine, which is present in black pepper, causes the spiciness. It is native to Kerala, the southern state of India. Since ancient times, black pepper is one of the most widely traded spices in the world. It is not considered a seasonal plant and is therefore available throughout the year. When dried, this plant-derived spice is referred to as a peppercorn, and is then ground into a powder to be put on food to add flavor and spice.

Because of its antibacterial properties, pepper is also used to preserve food. It is a rich source of manganese, iron, potassium, vitamin-C, vitamin K, and dietary fiber. Black pepper is also a very good anti-inflammatory agent.

Health Benefits of Black Pepper

The health benefits of black pepper include the following:

Good for the Stomach

Pepper increases the hydrochloric acid secretion in the stomach, thereby facilitating digestion. Proper digestion is essential to avoid diarrhea, constipation and colic. Pepper also helps to prevent the formation of intestinal gas, and when added to a person's diet, it can promote sweating and urination, which remove toxins from the body. Sweating removes toxins and cleans out the pores of any foreign bodies that may have lodged there, and it can also remove excess water or accumulation, also known as edema. In terms of urination, you can remove uric acid, urea, excess water, and fat, since 4% of urine is made of fat. For digestion, inducing digestion can help you lose weight and increase the overall functioning of your body and prevent various gastrointestinal conditions and colorectal cancer. Its ability to expel gas is because black pepper is a carminative, which forces gas out of the body in a healthy, downward motion, rather than pressing upwards in a dangerous way and straining the upper chest cavity and vital organs. It also inhibits more gas from forming in the body.

Weight Loss

The outer layer of peppercorn assists in the breakdown of fat cells. Therefore, peppery foods are a good way to help you shed weight naturally. When fat cells are broken down into their component parts, they are easily processed by the body and applied to other, more healthy processes and enzymatic reactions, rather than simply sitting on your body and making you look overweight.

Skin Health

Pepper helps to cure Vitiligo, which is a skin disease that causes some areas of skin to lose its normal pigmentation and turn white. According to researchers in London, the piperine content of pepper can stimulate the skin to produce pigment. Topical treatment of piperine combined with ultra violet light therapy is much better than the other harsher, more

chemically-based treatments for vitiligo. It also reduces the chances of skin cancer due to excessive ultraviolet radiation.

Respiratory Relief

In Ayurvedic practices, pepper is added to tonics for colds and coughs. Pepper also provides relief from sinusitis and nasal congestion. It has an expectorant property that helps to break up the mucus and phlegm depositions in the respiratory tract, and its natural irritant quality helps you to expel these loosened material through the act of sneezing or coughing, which eliminates the material from the body and helps you to heal from whatever infection or illness caused the deposition in the first place.

Antibacterial Quality

The antibacterial property of black pepper helps to fight against infections and insect bites. Pepper added to the diet helps to keep your arteries clean by acting in a similar way to fiber and scraping excess cholesterol from the walls, thereby helping to reduce atherosclerosis, the condition highly responsible for heart attacks and strokes.

Antioxidant Potential

An antioxidant like pepper can prevent or repair the damage caused by the free radicals and thus help to prevent cancer, cardiovascular diseases and liver problems. Free radicals are the byproducts of cellular metabolism that attack healthy cells and cause their DNA to mutate into cancerous cells. Antioxidants like black pepper neutralize these harmful compounds and protect your system from many conditions, even premature aging symptoms like wrinkles, age spots, macular degeneration, and memory loss.

Enhances Bioavailability

Black pepper helps in transporting the benefits of other herbs to different parts of body, maximizing the efficiency of the other health foods that we consume. That is why adding it to foods not only makes them taste delicious, but also helps make those nutrients more available and accessible to our system.

Cognitive Impairment and Neurological Health

Piperine, one of the key components of black pepper, has been shown in numerous studies to reduce memory impairment and cognitive malfunction. Chemical pathways in the brain appear to be stimulated by this organic compound, so early research demonstrates the possibility for pepper to benefit Alzheimer's patients and those that are suffering from dementia and other age-related or free radical-related malfunctions in cognition.

Peptic Ulcers

A number of studies have shown that black pepper may have beneficial effects on gastric mucosal damage and peptic ulcers, due to its antioxidant and anti-inflammatory properties. More research is still being done on this aspect of black pepper health effects.

Wholistic Development

■ Cognitive Domain

➤ Material Science

○ Lever

Types of Lever	Fulcrum	Work	Force	Example
First	Middle	One side	Other side	Scissor, Pairs of tong
Second	One side	Middle	Other side	Screw driver,
Third	One side	Other side	Middle	Forceps

- Lighter: According to Newton's first law in absence of external force body should maintain its motion with constant velocity. But instead of velocity remaining constant it reduces gradually and after travelling some distance body comes to halt. This force which opposes motion of the body is called as force of friction. When a body moves on a surface, keeping contact with the surface, force exerted by the surface on moving body, which opposes motion of the body is called frictional force. A lighter works on the principle of friction.
- Structure of Tea Mug: Upper portion of tea mug is broader than lower portion. Broader portion helps to make tea cold faster because more of surface area is in contact with environment and lower narrow portion keeps the tea hot due to small surface area in contact with environment.
- Structure of double layer Tea Mug : Outer layer of mug is not in contact with hot tea so its temperature is normal as environmental temperature, inner layer is not directly in contact with environment so it keeps the tea hot.
- Stove: Combustion converts fluid energy into heat which helps to prepare food.
- Shape & Size of Pan: Has utility for utilizing thermal energy and capacity for holding material used for tea preparation. Metal & structure of the Pan matter a lot.
- Reaction time also depends upon the surface area of sugar crystals.

■ Psychomotor Domain

- Handling of different materials and apparatus used tea preparation.
- Handling of Gas stove, lighter, and match sticks.
- Pouring tea from pan to pot.
- Cleanliness of platform before, during and after preparation of tea.
- Handling of hot pan with cloth or pan having Insulated handle, wooden handle.

- **Health and Environment**

- Utility of tea for human beings.
- Utility of used tea leaves for plants.
- Milk is a wholesome meal.
- Over extraction of tea is harmful for health.

- **Affective Domain**

- Tea preparation as a whole requires the wholistic faculty of a person and results into the wholistic development of persons.
- A sip of tea relieves the persons of fatigue & tension, howsoever, momentary.
- Tea symbolises togetherness of the unique characteristics of various ingredients.
- Tea symbolizes interrelation & cooperation of various agents, namely, tea gardener & workers, tea factory labourers, fuel sources & resources, and various Tea ingredients.

- **Spiritual Domain**

- Prepared tea is an integrated whole of many a ingredients, contributing their substance, flavour and essence with full immersion, where ingredients, their substance, essence, flavour, and fragrance all together become one.

Concluding Remark

Science as discipline can significantly contribute towards the development of universal beings. Though atomistic, the ultimate aim of science education is to have a comprehensive knowledge base of the entire universe so as to facilitate healthy, happy, full and meaningful life in resonance with all. We need to explore the genesis and constitution of every phenomenon scientifically. Teaching of Science rather than fragmented ought to be wholistic for the casting of balanced personalities.

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SYNTHESIZING RESEARCH

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CONCEPTUAL BACKGROUND:

A single study can rarely provide a generalizable and definitive answer to a research question focussed within the social sciences, especially in the discipline known as Education (Cooper, 1989; Hunter, Schmidt & Jackson, 1982; Mc Gaw, 1997). Results of a single study are frequently influenced by sampling characteristics such as the sample population, study setting, and timing. The research environment is often difficult to control and human behaviour complex to explain. In many areas, particularly Education, economic constraints may restrict the scale of any single study. As a consequence, the comprehensive investigation of an area, such as numeracy, may require the combination of results from several individual studies. At the same time, researches done in the field of education are scattered, piece-meal, isolated and thus inconclusive (Mohanty, 2008); Kaul (2006); (Ballad & Bawa, 2003); Gupta (2003); Goel (-); (Sekar, 2008). The individual researches are like the individual reality which is always less, at par, with that of the comprehensive reality. Is there any consistency in these various singleton study findings? Are these individual researches really converges somewhere or these remain stand-alone? How the contradictory results will be resolved lies there among the various studies findings responding to same research question? Are philosophical research studies can be synthesized? What are the methods to synthesizing research outcomes of empirical studies? The present paper tries to focuses on the issue of individualistic research versus the Wholistic reality. What can be methods/tools to synthesize these piecemeal researches into a comprehensive truth to arrive at some conclusion? The paper discusses at length some of the methods like Research Trend/Synthesis, Narrative Reflective, Vote Counting, Combined Significant Testing, Effect Magnitude (Meta Analysis), Best-evidence syntheses for synthesizing the research findings. This paper highlights the relative strengths and weaknesses of the contemporary Methods of Research Trend/Synthesis and proposes a multi-stage approach to Research Trend/Synthesis that draws on the strengths of each of these

individual methods. At the same time the various statistical techniques of Meta-analysis is also focussed in the paper.

RESEARCH SYNTHESIS: CONCEPT AND MEANING, IMPORTANCE AND DIFFERENT METHODS

As John Ralston Saul, a famous author, well said, "With the past, we can see trajectories into the future - both catastrophic and creative projections." The quotation points out the relevance of the information in hand. In Research Trend/Synthesis the things are done in the same manner. The term 'synthesis' having the lateral meaning of as "A new unified whole resulting from the combination of different ideas, influences, or objects" or "...Result of combination" and "...the process of combining different ideas, influences, or objects into a new whole."

The term is differently used in different areas. The lateral meaning of Research Trend/Synthesis is the practice of collecting information and attempting to spot a pattern in the information. The Oxford Thesaurus (2010) in financial terms, defines Research Trend/Synthesis as "...a comparative analysis of a company's financial ratios over time." Research Trend/Synthesis tries to predict a trend like a bull market run and ride that trend until data suggests a trend reversal (e.g. bull to bear market). Research Trend/Synthesis is helpful because moving with trends, and not against them, will lead to profit for an investor. An aspect of technical analysis that tries to predict the future movement of a stock based on past data. Research Trend/Synthesis is based on the idea that what has happened in the past gives traders an idea of what will happen in the future. In Project Management Research Trend/Synthesis is a mathematical technique that uses historical results to predict future outcome. In Statistics, Research Trend/Synthesis often refers to techniques for extracting an underlying pattern of behaviour in a time series which would otherwise be partly or nearly completely hidden by noise. A simple description of these techniques is trend estimation, which can be undertaken within a formal regression analysis. In recent times, Research Trend/Synthesis often refers to the science of studying changes in social patterns, including fashion, technology and consumer behaviour.

Research Synthesis is "Using the results of several studies to drive generalizations and conclusive statements about the theoretical relationship among variables." Thus, Research Trend/Synthesis is a form of comparative analysis that is often employed to identify current and future movements of events or group of events. The process may involve comparing past

and current status as they related to various entities in order to project how long the current trend will continue. This type of information is extremely helpful to persons who wish to make the most from the information of the events. Glass (1978), Pillemer (1980) , Cooper(1982) research synthesis is characterized by

- Pulling together the existing evidences which is known as discovery
- Integration of research studies requires conscious mind.
- A method as an area of serious inquiry
- Quantitative research synthesis methods to proceed independently

□ **Importance of the Research Trend/Synthesis**

Analysis, followed by the synthesis, is an essential activity in social sciences. The reasons for this are various. It mainly emphasized on threefold aspects

- a) To summarize the findings across studies
- b) To maintain the consistency of findings
- c) To resolve contradictory findings

□ **Importance of Research Trend/Synthesis synthesizing deals with**

- a) Accumulation of the knowledge
- b) Importance of maintaining high standards in their execution according to the findings
- c) Resolving the conflicting findings to give it a new shape
- d) Helps in characterizing the methodologies used in the field of inquiry
- e) Helps in finding out the new methods

□ **The process of a Research Trend/Synthesis** begins with identifying the category of the events that are under consideration. Once the focus is established, one takes a long at the general performance for the category over the last couple of years. This helps to identify key factors that led to the current trend of performance for the entity under consideration. By understanding how a given event reached the current level of performance, it is then possible to determine if all or most of those factors are still exerting an influence. After identifying past and present factors that are maintaining a current trend in performance, one can analyze each factor and project which factors are likely to continue exerting influence on the direction of the event. Assuming that all or most of the factors will continue to exert an influence for the foreseeable future, one can make an informed decision on the future course of action.

So Research Trend/Synthesis is important both in it as a scientific activity & of the practical uses made of the conclusions which are derived from research trend synthesis. The

process of the trend analyzing the educational research can be systematically done with using the following Methods like

A. Narrative approach: As the name indicates, it is a verbal description of the research studies arranged chronologically about what the researcher did in each study & the results found. It is most suitable when the number of the studies on a topic is small. The strength of the narrative approach is

- a. It provides richness of the details about the study characteristics
- b. Allows the researches to trace the evolution of thought because of the chronological arrangement.
- c. It can be used to synthesize two or more different lines of research that may bear only indirectly on each other.

□ **Summarizing results across the studies**

Narrative approach relies heavily on the statistical significance & reported results of the individual. The statistical technique portrayed for the research result is a highly subjective matter. The subjectivity in summarizing the findings inherent in narrative approach can lead in different conclusions

□ **Assessing the results across studies**

Narratives approach provides no significant mechanism for assessing the consistency of the results other than a verbal description.

□ **Resolving contradictory findings across studies**

There is no systematic mechanism for resolving contradictory findings. Narrative approach is always susceptible to the confusion between research criticism & research integration.

Limitations: The sample of studies examined in a narrative review is based on the author's whim, rather than on publicly shared standards. Narrative reviews lack acceptable rules of inference for going from the findings of studies to overall generalizations about the research literature. Narrative reviews are not well-suited for analyzing the impact of moderating variables. Authors of narrative reviews rarely reach clear conclusions regarding how methodological variations influence the strength of an effect. They also typically fail to report the rules they use to classify studies when looking for the effect of a moderating variable.

B. Vote counting method: It is the most popular and is supplanted from narrative method, when there are a larger number of the studies. It involves categorizing the studies on the basis of the direction & statistical significance.

The strength of vote counting method is: (a) once the relevant set of studies to be synthesized has been identified, the method can be executed quickly. (b) Results of vote counting are replicable because it is less subjective. The intrinsic role that vote counting method play are:

□ **Summarizing results across the studies:**

It is a straight forward process and the category into which the statistical results of the most studies fall in described as the treatment effects or the relationship between variables.

□ **Assessing the consistency of results across studies:**

It assumes that there will be inconsistency in findings across studies & the objective is to identify which statistical result among the set of inconsistent findings is most prevalent. Thus, vote counting methods provides no systematic mechanisms for assessing the consistency of results.

□ **Resolving contradictory findings across studies;**

It does not attempt to resolve contradictory findings across the studies but contradictory findings are likely to exist. The researchers have not used such approaches to resolve the contradictory findings in any consistent or systematic way.

C. Combined significant tests: This method involves the combining of probabilities or common test of significance statistics across several studies addressing the same research questions & assessing the statistical significance of this over all values. This method was introduced because of the inadequacy of voting method. The main importance of combined significance method is that they help to eliminate the low treatment effect of vote counting method. Rosenthal (1978) provided an excellent description of the procedures, advantages, limitations and applicability of nine combined significance tests Adding logs; Adding 'P's ;Adding 't' s; Adding 'Z' s; Adding weighted 'Z' s ;Testing mean 'p'; Testing mean Z; Counting and Blocking. This is highly significant method but it does not have any mechanism explaining the variability of results across studies.

D. Effect magnitude Method: Meta-analysis is a research synthesis that uses a quantitative measure, effect size, to indicate the strength of relationship between the treatments and dependent measures of studies making up that synthesis. Glass coined the term 'Meta-

Analysis' to refer to the methods of Research Trend/Synthesis that are statistical in nature. Meta analysis is a formal statistical method which assessed the magnitude of an effect. Glass developed this technique, so that a variety of findings could be quantified, standardized & then compared across studies. The most common effect size indices used in meta-analyses are d , r , and odds ratio (OR), although risk ratio (RR) and number needed to treat (NNT) also have been used. Here for the purpose the simple index of Meta analysis uses the 'Effect size (E_s)' statistics (also called as Cohen's d)

$E_s = (X_t - X_c) / SD_c$ where, X_t = mean of the treatment group; X_c = mean of Control group ; SD_c = Pooled Standard Deviation of the control group and Experimental Group i.e. simple formula is $\sigma_{pooled} = [(\sigma_1 + \sigma_2) / 2]$ and more specifically by Thalheimer & Cook, (2002) is

$$s_{pooled} = \sqrt{\frac{(n_t - 1)s_t^2 + (n_c - 1)s_c^2}{n_t + n_c}}$$

Where s = pooled standard deviation, n = number of subjects *Subscripts: t* refers to the treatment condition and *c* refers to the comparison condition (or control condition).

This statistics provide a composite figure for treatment effect which synthesizes the general impact of the treatment across the different studies. An effect size for each of the finding in a study is computed and E_s are then averaged together. This allows for significance & non significance findings to influence the total ES equally, thus minimizing the possible influence of type I & type II errors, evaluating research findings. Meta analysis fulfils three criteria

- a) Only studies examining the effect of a series of lesson or training treatment were included.
- b) Only those studies which are equal in a single variable are included which is done for the comparability among studies in terms of the characteristics.
- c) The third criterion for including a study in meta-analysis is a technical one. In order to be included, a study has to provide sufficient data from which an ES can be calculated.

Summarizing these methods the emerging overall picture is tabulated in table 1. Thus it is clear that, research done in any field need to be reviewed at the regular interval of the time so to improve the quality of the research.

Table 1***Methods Addresses the Three fold Aim of Research Trend/Synthesis***

Sr. No.	Method	How the results summarized	How consistency of results assessed	How conflicts in findings resolved
1	Narrative Reflective	Verbal description of procedures used and statistical significance reported results Overall conclusions based on reviewer's subjective weighting of studies	No systematic mechanism Verbal description of concurrence of statistical results	No systematic mechanism Verbal description of study characteristics that seem to mediate reported results
2	Vote counting	Tabulation of direction & statistical significance of reported results: positive, negative & no significant results Category into which most studies fall is the effect or relationship between variables	No systematic mechanism Proportion of studies falling into each category	No systematic mechanism Tally studies separately for subsets of studies
3	Combined significance test	Combined p-values or size of test statistics (t-ratios, chi-square, z etc.) and assess statistical significance of this overall index	No systematic mechanism	No systematic mechanism
4	Effect magnitude	Average standardized indices of effect magnitude computed for each study	Post distribution of effect magnitude Statistical test of homogeneity of effect magnitude	Correlation of study characteristics with indices of effect magnitude Test homogeneity of effect magnitude separately for clusters of studies that differ on study characteristics

(Source: Goel, D. R. (). *Synthesizing Research Findings*. In D. R. Goel (Ed.) *CASE Publication*, Vadodara: M.S.U. Baroda. pp. 150-157)

Table 2

Research Trend/Synthesis methods Suitability and Techniques

Sr. Method	Suitable for	Technique
No.		
1 Narrative Reflective	Number of studies are small, Philosophical/Qualitative/discriptive	Content Analysis
2 Vote counting	All the studies have data on dependent variable and specific independent variable. Tabulation of direction & statistical significance of reported results: positive, negative & no significant results	Frequency count of the positive, negative & no significant results
3 Combined significance test	Studies having the empirical/statistical values like p-values or size of test statistics (t-ratios, chi-square, z etc.) and assess statistical significance of this overall index	$X^2 = -2 \sum_{i=1}^k \log_e(p_i),$ <p>When the p-values tend to be small, the test statistic X^2 will be large, which suggests that the null hypotheses are not true for every test</p>
4 Effect Magnitude	Studies having the empirical/statistical values	<p>Calculating Cohen's d i.e. 'Effect size (E_s)' from t-tests statistics</p> <p>(a) $E_s = (X_t - X_c) / \sigma_p$ where, X_t = mean of the treatment group; X_c = mean of Control group ; σ_p = Pooled Standard deviation</p> <p>(b) When an experiment that uses a t-test does not list standard deviations, you can calculate Cohen's d as follows using the t statistic:</p> $d = t \sqrt{\left(\frac{n_t + n_c}{n_t n_c} \right) \left(\frac{n_t + n_c}{n_t + n_c - 2} \right)}$ <p>$t = t$ statistic; n = number of subjects</p>

ILLUSTRATION: CONDUCTING META ANALYSIS

Suppose the study “A STUDY OF EFFECTIVENESS OF MODULAR APPROACH FOR TEACHING SCIENCE TO CLASS IX STUDENTS IN TERMS OF THEIR ACHIEVMENT AND REACTIONS TOWARDS MODULAR APPROACH” is being replicated ten times with similar samples with the same null hypothesis “There is no significant difference between the achievement scores of class IX students taught through Modular approach and that by the conventional approach.” (Table 3) Synthesis of these researches simply requires that to convert each study outcome to a standard metric. This can be done in two basic ways: Statistical significance and Effect size (Es). Both provide a “metric-free” measure that allows combination across different kinds of outcomes. The kind of effect size used distinguishes the major types of meta-analysis: d (Cohen; Glass), g (Hedges), r (Rosenthal; Hunter & Schmidt) and others. Synthesis across the studies provides an overall test of the common hypothesis: “Do groups exposed to Modular approach exhibit more achievement than exposed to Traditional Approach?” The mean effect size gives an indication of the strength of the relation.

Typically, effect-size estimates are interpreted in two ways. One way is to rely on commonly accepted benchmarks that differentiate small, medium, and large effects. Perhaps most well-known are those benchmarks presented by Cohen (1988) for interpreting Cohen's d , whereby 0.2 equates to a small effect, 0.5 equates to a medium effect, and effects larger than 0.8 equate to large effects. Thus, in the example above, the difference represents a large effect (Cohen, 1988).

The second way to interpret an effect size value is to explicitly compare the reported effect size to those reported in prior studies of a similar nature (Thompson, 2002a; Vaccha-Haase & Thompson, 2004). For instance, hypothetically a researcher might study the impact of a Modular approach study for Achievement compared with that of a no-treatment control condition. Let's assume that post-treatment measurement of Achievement, indicated an effect size of $d = 0.5$, medium in size based on Cohen's benchmarks. A savvy reader, however, is particularly interested in how this treatment's effect size compares to those of other treatments studies conducted earlier. As a complement to providing the effect size ($d = 0.5$) and its standard interpretation (medium in size), the researcher also should point out how this effect compares with those of other treatments of Modular Approach. For example, perhaps a previously published study found an effect size of 0.92 for a same treatment. This effect size provides a useful comparison to interpret the impact of the treatment program. It is not

enough to know that one treatment is better than another; readers of the research literature should expect authors to quantify and explain how much better.

Table 3

Mean Standard Deviations and Effect Size of the various studies

Study	X_c	σ_c	X_t	σ_t	Pooled σ	E_s
1	30	3	34	3	4.5	0.89
2	40	3.4	26	3.6	5.2	-2.69
3	45	4	47	4.1	6.05	0.33
4	34	3.9	47	3.7	5.75	2.26
5	35	4.5	40	4.8	6.9	0.72
6	30	3	34	3	4.5	0.89
7	40	3.4	26	3.6	5.2	-2.69
8	45	4	47	4.1	6.05	0.33
9	34	3.9	47	3.7	5.75	2.26
10	35	4.5	40	4.8	6.9	0.72
Average						0.30
E_s						

Inclusion of effect sizes has an important benefit beyond the calculation of practical effects. Specifically, effect sizes can be compared across studies using a technique called meta-analysis. In a meta-analysis, a researcher statistically summarizes and integrates the effect sizes of multiple studies to calculate an average effect size.

Statistical analysis common to Meta-analysis is the test for homogeneity of the effect size distribution. Is the mean effect size of a particular construct representative of the population effect size? How much variability should be expected around the mean effect size? The assumption is made that if the distribution is homogeneous, then the variability around the effect size is no greater than would be expected from sampling error (Lipsey and Wilson, 2001). However, if the variability around the mean effect size is large (effect size distribution is heterogeneous), then it appears that each effect size is not estimating a common population mean.

To test for a homogeneous distribution, a common test used is the Dixon's Q test. If Q is statistically significant, the null hypothesis of homogeneity is rejected and the researcher assumes a heterogeneous distribution. Another statistical test that can be used to test for a homogeneous effect size distribution is the χ^2 test of goodness of fit. Connor and colleagues

reported a significant mean effect size indicating that stimulant treatment reduces clinicians' ratings of aggression. They followed up this finding by testing the mean effect size distribution for homogeneity using the χ^2 test of goodness of fit. Their result was statistically significant, rejecting the null hypothesis of a homogeneous distribution.

Calculate the Homogeneity of the effect Size distribution using the χ^2 test of goodness of fit or Dixon's Q test. Also One-Sample T Test procedure tests whether the mean of a sample effect size distribution differs from the Effect size population mean.

Table 4

N, M, σ , SE_m for the Effect Size (ES) distribution

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
ES	10	.3020	1.71963	.54379

Table 5

One sample t- test for the Effect Size (ES) distribution

One-Sample Test						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
ES	.555	9	.592*	.30200	-.9281	1.5321

*Note. * Not significant*

From the table 5, the calculated t value found to be not significant at .05 level. Thus there is no significant difference between the mean of effect size distribution and the population mean of the all such effect sizes. Thus the effect size distribution is homogenous.

Therefore, the overall effect size (Es= 0.30) implies medium impact of the Modular approach on achievement as far as the summarizing the different findings is concern.

CONCLUSION

Researcher formidable task is to find the absolute truth which is philosophically utopia. Further researchers do some interpolate/extrapolate to approximate the reality as it appears to oneself. The various such researchers will find the different approximations for the same absolute reality waiting to be take a shape of theory. As far as the empirical studies are

concerns the well defined statistical methods are available. At the same time the traditional narrative reflective methods are also find some grounds for synthesizing the research findings of qualitative studies. Although the subjectivity lies there but still such tasks are not find suitable hands in the area of educational research. Summarizing the results of many studies as an effect size index provides important strength of relationship information. Such methods of synthesizing research can help the varied and numerous researches to reach at some convergence and conclusive thesis.

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TEACHER EDUCATION 2015+

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ABSTRACT

With the advent of 2015+, the Nation enforces numerous changes in the structure and functioning of Teacher Education Institutions of India, as evident through the NCTE Regulations of November 2014. Highest Orders Emerge Out Chaos. That is the present state of Indian Teacher Education. Educational Norms, Standards, Regulators are the functions of visionaries who are in a position to empathize with the present & forecast & attempt to cast the future in resonance with ethos of the Nation. The focus of the present Paper is designing curricula for Two Year B.Ed. and Two Year M.Ed. Programs as suggested by the latest norms of Teacher Education in India. Finally, it pleads for a kernel of Congruence amongst all the levels of Teacher Education

With the advent of 2015 A.D. the latest NCTE Regulations (F.51-1/2014-NCTE (N&S), NCTE, New Delhi, the, 28th November, 2014 & The Gazette of India, No. 346, New Delhi, Monday, Dec. 1, 2014) present a sea change. Each Unit of D. El. Ed., B.Ed. and M.Ed. is of 50 Pupil Teachers. There is corresponding Increase in the Teacher Education Staff Size. There is countrywide formulation of compatible curricula with the enhanced time duration of the Teacher Education Programs. We have excellent Philosophers & Philosophies, we have excellent Sociologists & Sociology, We have excellent Psychologists & Psychology, We have excellent Historians & History, but, how many of these find expression at the functional level. There are wide gaps between expectation & expression. Then what has made the NCTE cut down the Pedagogic Qualifications of the Teacher Educators for these Courses? How long will the Philosophers, Sociologists, Psychologists & Historians reside in books only? The Teacher Education is lost in the rut & routines of Micro-Teaching mainly, while, the present century has already flagged many challenges. When will we integrate even basic skills to realize Skill Integrated Education? We envisage Humane & Professional Teachers. Do we really have, two, in one? Most of the Teacher Education Institutions do not have functional laboratories. There are wide gaps

between the Teaching Competencies expected & practiced. We have more of descriptive & evaluative research than suggestive. We have more of quantitative research than qualitative. What use are research & innovation if these do not find expression at the field level. It has become a practice to appoint fresh teachers as SHIKSHAN SHAYAK & Teacher Educators as TEMPORARY TEACHING ASSISTANTS. The question is why Adhoc & Contractual. Why Teacher Education has been delimited to School Education? The latest Teacher Education Regulations seem to be highly idealistic. The question is how to convert idealism into realism. There are numerous issues & concerns. With the latest NCTE Regulatory Norms & Standards there is immediate Storm in the field. The offspring of JVC in the form of Nov. 2014 NCTE Regulations has resulted into high resonance in the Teacher Education Institutions of India. There is an immediate need at National Level to reflect on these regulations & enunciate objectives, design curricula, media & modes of transaction, and evaluation mechanisms with respect to most of the Teacher Education Programs. There has to be Teacher Education determination to address the developmental challenges of India. To begin with do the Teacher Education Institutions have minimal infrastructure for Two Year Graduation & Post- Graduation Programs? Do the Teacher Education Programs have compatible curricula, modes of transaction & evaluation for the enhanced duration? Are the schools ready for Practice Teaching? Shall we keep superimposing TETs and TATs, NETs & SETs? How long we will keep disowning our own products? Do we really have Manpower Planning for School Education & Teacher Education? If yes, then what is its level of perfection? How many Trusts can be Trusted for the enhanced duration of the Teacher Education? Are we in a position to resolve Public Private & Service Profit dichotomy? When there is change every else where, then, how come Teacher Education & School Education are Stale & sterile? When will there be valid Manpower Planning in Education? How will we realize healthy Teacher Education & Schools Education? How will we realize Corporate Social Responsibility in Education? How will we realize Technology Integrated Education? When will we design Activity Based Curricula? When will we learn cooperatively? When will we practice Participatory Approach of Problem solving? When will we design suitable Inclusive Education? When will we introduce the Constructivist & Connectionist approaches? When will we realize creative & critical thinking? When will we learn to sustain the cultural heritage of India & to have perfect vision of the invisible? When will we learn to value the indigenous? When will Education realize its identity in India? Pumping in crore of rupees can facilitate Education, but, it demands crore of Heads, Hearts, Hands & Souls in full resonance to realize Education. RTE can legalize Education, but, it demands the wish & will of all to culture Indian Education. We need to have determination with action to realize Elementary Education, Higher Education, Vocational Education & Professional Education. Visual Learning Environment, Health, Life Skills, Social Networking, Corporate Social Responsibility, Technology Integration, Activity Base, Cooperative Learning, Participatory Learning, Inclusive Education, Constructivist Approach, Connectionist Approach, & Choice Base. All these aspirations have their roots in

ancient Indian Education. Could we revive the eastern history to modernize Teacher Education & School Education? Constructivist Learning Approach has been talked a lot, but, rarely implemented in the Schools. Many a Schools have initiated into Activity Based Approach, but, it needs to be strengthened. Rarely teachers are competent to deal with Inclusive Classes. Diagnosis & Remediation are done rarely. Neither the curricular nor the co-curricular activities are up to the mark. Many a children in English Medium Schools are not at ease with English. Mathematics Teaching-Learning is too abstract. History & Civics Teaching has lost the essence.. No sensitivity to cultural heritage & religious heritage & eastern values. Social Sciences seize to have normative responsibility. Science is loosing Scientific Outlook & In-look. Wholism is a figment of imagination. Multiple Intelligence & Life Skills are implemented, but, only at the surface level. Research by the Teacher Education Institutions as at rest in the Research Report Volumes. It rarely finds expression in the School Education. All the Philosophers & Philosophies, Sociologists & Sociology, Technologists & Techniques are resident in the Volumes of Teacher Education. There is a wide gap between the Volumes of Teacher Education & Classrooms & Fields of Schools. What use are the ideas, ideals & ideologies if these do not find expression in the field? Some of the Universities in India, both, old and new, such as, University of Mumbai, Maharashtra, University of Guwhati, Assam and Ravenshaw University in Odisha are conferring Doctoral Degrees in Education under the Faculty of Arts. Education is not even considered by them an entity and faculty. So, there is a question of identity. Education which is unconditional greatest Service in Society has not been recognized by the Service Sector in India. UPSC in India has failed to include Education as a discipline. *There is a false notion that Education has only a little core, but, more of periphery. Education suffers from the missing elements of unique discipline which are non replicable in other disciplines.* It seems that such thinking has failed to appreciate that Education is the core of every discipline. Education is interdisciplinary. All the disciplines emerge from Education and merge into Education. Education does have a unique body of knowledge, a repertoire of unique skills and attitudes and a code of conduct. As the code of conduct of a doctors is –“We will keep serving the humanity without considering our comfort or discomfort.” Similarly, the code of conduct of an Educationist is –“We will strive for Integral Humanism & Universal Being. Teacher Education is expected to develop Humane & Professional Teachers. We need to renew Teacher Education & realize identity of Education.

a. B.Ed. Program

Proposed Grade Distribution of B. Ed. Programme

Total Credits= (25+27+26+27=105)

SEMESTER-I & II

Domain	Course No	Semester-I		Semester-II
Perspectives in Education	1	Philosophical ,Historical & Economic Foundation of Education (3)	7	Contemporary India & Education (3)
	2	Childhood & Adolescence Education (3)	8	Learning, Teaching & Evaluation (3)
Practicum	3	Internship (6) • Skill Focused Teaching • Simulated Teaching • Professional Capacity Building • Assignment • Developing Teaching Aid • Tutorial	9	Internship (6) • School Teaching • School Experience • Professional Capacity Building • Assignment • Developing Teaching Aid • Tutorial
Curriculum & Pedagogic Studies	4	Subjects & Disciplines (3)	10	Subjects & Disciplines (3)
		Teaching Method I (3)		Teaching Method I (3)
		Teaching Method II (3)		Teaching Method II (3)
	5	Special Field (3)	11	Special Field (3)
Test	6	First Semester End Viva Voce test (Internal) (1)	12	Second Semester End Viva Voce test (External) (1)
			13	Annual Test Lessons (2)
		(25)		(27)

SEMESTER-III & IV

Domain	Course No	Semester-III		Semester-IV
Perspectives in Education	14	Inclusive Education (3)	20	School & Society (3)
	15	Curriculum Development (3)	21	ICT in Education (3)
Internship	16	Internship (16) A. Lessons based on various Approaches, such as, <ul style="list-style-type: none"> • Cooperative Learning, • Constructivist Approach, • Connectionist Approach, • Wholistic Approach, • Task Based Approach • Activity Based Approach • Participatory Approach • Reflective Dialogue • Models of Teaching • Social Network B. School Experience <ul style="list-style-type: none"> • School Admission • Time Space Personnel Management • Morning Assembly • Introduction with the School Plant • Classroom Management • Library Management • Laboratory Management • Play Fields Management • Maintenance of Garden • Management of 	22	Internship (16) A. Lessons based on various Approaches, such as, <ul style="list-style-type: none"> • Cooperative Learning, • Constructivist Approach, • Connectionist Approach, • Wholistic Approach, • Task Based Approach • Activity Based Approach • Participatory Approach • Reflective Dialogue • Models of Teaching • Social Network K. School Experience <ul style="list-style-type: none"> • School Admission • Time Space Personnel Management • Morning Assembly • Introduction with the School Plant • Classroom Management • Library Management • Laboratory Management • Play Fields Management • Maintenance of Garden

		<p>Canteen, Drinking Water, Wash Rooms</p> <ul style="list-style-type: none"> • Conducting of Meetings • Organization of Cultural Activities • Organization of Field Trips & Picnics <p>C. Diagnosis & Remediation D. Action Research E. Social Networking with the Students & Parents F. Evaluation G. Guidance & Counseling H. Placement & Follow up I. Blue Print & Preparation of Test Items J. Tutorial</p>		<ul style="list-style-type: none"> • Management of Canteen, Drinking Water, Wash Rooms • Conducting of Meetings • Organization of Cultural Activities • Organization of Field Trips & Picnics <p>L. Diagnosis & Remediation M. Action Research N. Social Networking with the Students & Parents O. Evaluation P. Guidance & Counseling Q. Project Work R. Placement & Follow UP S. Tutorial</p>
Curriculum & Pedagogic Studies	17	Teaching Method I (1)	23	Teaching Method I (1)
		Teaching Method II (1)		Teaching Method II (1)
	18	Special Field (1)	24	Special Field (1)
Test	19	Third Semester End Viva Voce test (Internal) (1)	25	Fourth Semester End Viva Voce test (External) (1)
			26	Annual Test Lessons (2)
	TOTAL	(26)		(27)

Special Fields for B.Ed.

1. Guidance & Counseling
2. Educational Technology
3. Environmental Education
4. Value Education
5. Curriculum Development
6. Special Education
7. Institutional Planning & Management
8. Better School Examination
9. Yoga Education
10. Health Education
11. Futurology of Education
12. Action Research
13. Educational Leadership
14. Communication
15. Open Book Examination
16. Mental Hygiene & Child Development
17. CSR & Education
18. Humanistic Education
19. Wholistic Education
20. Taxonomy of Educational Skills
21. Constructivist & Connectionist Approach

b. Grade Distribution of M. Ed. Programme

Total Credits=(27+27+26+25=105)

SEMESTER I&II

		Semester-I			Semester-II	
Perspectives in Education	1	Philosophical Foundation of Education	3	10	Psychological foundation of Education	3
	2	Sociological foundation of Education	3	11	Historical foundation of Education	3
Educational Research	3	Methods of Educational Research I	3	12	Methods of Educational Research II	3
PDPs	4	Conceptual Paper: Preparation and Presentation	3	13	Dissertation proposal preparation & Presentation	3
	5	Workshop on Professional Writing & Communication Skills	3	14	Review of a thesis and Reporting	3
	6	Internship <ul style="list-style-type: none"> • B.Ed. Teaching • supervision of Practice - Teaching-B.Ed. • Development of Innovative Curriculum & Transaction Approaches • Educational Planning & Administration • In-Service Training for School Teachers 	4	15	Internship <ul style="list-style-type: none"> • B.Ed. Teaching • supervision of Practice Teaching-B.Ed. • Development of Innovative Curriculum & Transaction Approaches • Educational Planning & Administration • In-Service Training for School Teachers 	4
Elective	7	Special Area	3	16	Special Area	3
Test	9	First Semester End Viva Voce test	2	18	Second Semester End Viva Voce test	2
		TOTAL	27			27

SEMESTER III & IV

		Semester-III			Semester-IV	
Perspectives in Education	19	Political & Economical Foundations of Education	3	28	Logic & Knowledge	3
	20	Curriculum Development	3	29	Education Studies: Retrospect & Prospect	3
Core Courses	21	ICT in Education	3	30	Web Technologies & E-Learning	3
PDPs	22	Developing & Presenting a Paper in Seminar	3	31	Development of an innovative pedagogic intervention	3
	23	Employing Dissertation Methodology	3	32	Dissertation Reporting & Presentation	3
	24	Construction & Administration of a Tool	3			
Internship	25	<ul style="list-style-type: none"> • B.Ed. Teaching • Supervision of Practice - Teaching- B.Ed. • Development of Innovative Curriculum & Transaction Approaches • Educational Planning & Administration • In-Service Training for School Teachers 	3	33	<ul style="list-style-type: none"> • B.Ed. Teaching • Supervision of Practice Teaching- B.Ed. • Development of Innovative Curriculum & Transaction Approaches • Educational Planning & Administration • In-Service Training for School Teachers 	3
Elective	26	Special Area	3	34	Special Area	3
Test	27	First Semester End Viva Voce test	2	35	Second Semester End Viva Voce test	2
				36	Dissertation viva-voce	2
		TOTAL	26			25

Special Areas for M.Ed.:

1. Elementary Education
2. Secondary & Higher Secondary Education
3. Higher Education
4. Teacher Education
5. Computer Education
6. Guidance & Counseling
7. Administration & Management
8. Planning & Policy Making
9. Environmental Education
10. Peace Education
11. Value Education
12. Measurement & Evaluation
13. Comparative Education
14. Curriculum Development
15. Health Education
16. Corporate Social Responsibility & Education
17. Inclusive Education
18. Wholistic Education
19. Taxonomy of Educational Skills
20. Taxonomy of Educational research
21. Humane & Professional Education

RECOMMENDATIONS:

1. There should be added infrastructure for the enhanced duration & size of the various Teacher Education Programs as per the latest norms of the NCTE.
2. There should be NCTE & State Directives to Schools for providing Schools for Internship & Practice Teaching.
3. The Teacher Education Institutions should design compatible curricula & syllabus for the enhanced duration of the Teacher Education Programs well in advance of the commencement of the Academic year 2015-2016.
4. Immediate Action should be initiated for appointment of the required staff by the Teacher Education Institutions.
5. Professional Development Programs should be organized by various agencies and institutions.

6. It does not seem to be feasible to run the B.Ed. Program with only one Unit, whether Public or Private, because, it will not be cost effective. Unit size of 50 even at the face of it is too limited to include various Methods of Teaching & Specializations.
7. Quality enhancement of the Teacher Education Programs demands scientific analysis at the functional level.
8. There should be entrepreneurship Education in Teacher Education with immediate effect.
9. There should be Inputs on how to Design & Implement Self Supportive Projects.
10. There should be inputs on Media Management, Learning Resources Management Systems & E-ethics.
11. There should be engagement of M.Ed. Students with Pre-Service & In-Service Teacher Education.
12. M.Ed. Students be associated with the Organizations engaged in the development of innovative curriculum & pedagogic practices.
13. B.Ed. & M.Ed. Students should be associated with the institutions involved in Text Book Development, Educational Policy Planning, Formation & Implementation, and Educational Administration & Management.
14. M.Ed. Student Participation in the Weekly Research Seminar/Colloquium need to be ensured.
15. There should be orientation on Educational Management Information System Series.
16. There ought to be focus on TQM in Education.

Concluding Remarks:

There is a need to have a Kernel of Congruence amongst all the levels of Teacher Education. Could we evolve a Common & Congruent Teacher Education Model for all the levels? Any Teacher should be thorough with **HUMAN PSYCHOLOGY** from infant through ripe, **HUMAN SOCIETY** from National to International, **WORLD** from Dot to Globe, **UNIVERSE** from Physical to Meta-Physical, and above all the **COLLECTIVE WISDOM** of all. Does it appeal if we propose a **COMMON PARADIGM** of **TEACHER EDUCATION** cutting across the commonalities, such as, understanding of a person & constellation, subject & discipline, Communication Skills & Competencies & multiple perspectives?

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21st Century Teacher

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Absolute Identity of Teacher

“Guru Brahma, Guru Vishnu, Guru Devo Maheshwaraha”, that is, Guru is creator , preserver, and destroyer. Guru tries to transcend time-space-matter-mind & life by adoring the absolute- Omnipresent, Omnipotent & Omniscient. We have been constructed through the patience, competence and struggle of our teachers. Our schools have been and are the learning organizations in the prayer, in the classroom, in the corridor, in the library, in the laboratory, in the play fields, in the dispensary, in the community, everywhere in every sphere. Teacher is the mother root for all the professions and professionals. Education the occupation, religion & profession of teachers is the mother of all the disciplines. All the disciplines emerge from Education and merge into Education.

Saint Kabir has said that “Teacher and God both are standing before me, whom should I pay obeisance? I bow to you my Teacher, who guided me to God”. Alexander the great who wanted to conquer the world said, “I owe my birth to my father but life to my teacher”. The influence of teacher never ends because it affects the eternity. A teacher affects throughout life. The influence is like a helical spiral, neither we know its origin nor do we know where it ends. Its spread is infinite.

Galaxy of Teachers

“In the era of KRTA, teacher punishes the student, the student accepts it as a blessing (MAHAPRASADM), in the Era of TRETAYUGA, teacher rebukes the student, the student accepts it as a blessing, in the Era of DWAPRAYUGA, teacher requests the student, the student accepts it as a blessing, whereas, in the present era, that is, KALIYUGA, teacher stoops at the student, the student accepts it as a blessing.”

(Krtayugadalli Sriguru shishyange badidu heldaga aagali mahaprasadavendanayya, Tretayugadalli Sriguru shishyange baydu heldaga aagali mahaprasadavendanayya, Dwaparayugadalli Sriguru shishyange bedi heldaga aagali mahaprasadavendanayya, Kaliyugadalli Sriguru shishyange vandisi heldaga aaglai mahaprasadavendanayya.)

The process of recoil of the Teacher Taught Relation needs a lot of research and development.

Challenges Being Faced by the Teachers

Today there are many a challenges for teacher preparation, such as, Manpower Planning, Developing knowledge base, Bridging the gaps between expected teaching skills & competencies & practiced, expected curricula & practiced curricula, matching teaching styles with learning styles, integration of Taxonomy of Educational Objectives & Skills, preparation for inclusive education, specialization in emerging areas, such as, peace education, value education, yoga education, ICT in Education. There is an immediate need to groom a lifelong autonomous learner and to evolve child inspired and not merely a child centred approach, Choice Based Credit System, not only out of given, but, also out of desired & demanded. The Teachers are prepared with the past curriculum, and expected to prepare the present children for the future, the process itself looks illogical, and there is mismatch between expected and practiced. During Pre-Service and In-service training the teachers fight

mentally to get adjusted with the newly developed methods and currently running methods. Pre-Service Teachers were found to be confused initially to find their niche between University Prescribed lesson designing, and the Researcher introduced approach that is ICT Aided Constructivist Learning Approach. (Ganiger & Goel, 2014). The present era needs very competent teachers, for that, the Teacher Education should be strengthened. The present Pre-Service Teacher Education System is expected to provide teachers who are capable of dealing with the learners of the highly technical globalised world. Quality Education demands Skilled & Competent Teachers.

Education is becoming more and more commercial. Educational values and ethos rarely find expression. The commercial people are using the educational institutions for their business. They have little concern for quality education, teachers and learners. There is mismatch between the subjects taught and the degrees of the teachers. There are parallel private coaching classes. The parents are mad after English Language Proficiency. The teachers are not update. The teacher education programmes are also not keeping pace with the changing world. Teachers are unaware of the changes taking place in the educational sector. The mismatches between the qualification and current profession are causing severe damages. At the same time a teacher is expected to fit everywhere.

Teaching: Expectation & Expression

21st Century teachers are expected to be classical cum modern, backbone of the country, architect of the society, closest to the children, self confident, inquisitive, faithful, dutiful, simple & humble, a role model for the learners, promoter of participatory approach, civilized ideal citizens, and above all friend, philosopher & guide. A teacher ought to be sincere & hardworking, socially sensitive & professionally committed, autonomous & accountable &

fast renewing. But, the tragedy is that at times the teachers feel the void of being a teacher and end up the day in non-teaching activities.

Constructivist & Connectionist Teacher

Every teacher ought to be germinator of new ideas, incubator, innovator, creator, constructivist & connectionist. They should be Prosumers.

ICT Skilled Teacher

Information and Communication Technology has revolutionized the society, the living style of each and everyone is being affected by ICT. Education field is not an exception. There is added advantage of ICT in Education. The teachers must be aware of all the possible ICTs and know the integration of ICT in education, for teaching, learning, experimenting, sharing, discussion, inclusive education, remedial teaching and evaluation.

The teachers must be wholistic by their philosophy and practicality. The learners must be prepared for the life not for the examination sake. They must be prepared to design their own solutions and to upload the original productions. Teachers must be creative & constructive at the same time connective.

Action Researcher Teacher

The teachers should have time & space to grow and develop in the present day culture & environment. Teachers should conduct Action Research into the Education problems and find the possible indigenous solutions, through their own sources, resources & methodology to better their professional quality. For that the teachers need to be proficient in research and development.

Humane & Professional Teacher

Humane and Professional teachers are rarely found these days. Our Indian ethos is degenerating. Our values, customs, traditions and culture are fading. We rarely observe the cultural heritage. Orientation in humanistic education is required to enhance the self concept, instructional mastery, social relationship & creativity of the teachers. Teachers should be humane & professional, both.

Attributes of 21st Century Teacher

The 21st Century Teacher ought to be master of contents, creative & critical thinker & reflector, self director, inventor, info-savvy & techno-savvy, and collaborator- a universal becoming & being. The Teacher has to be constructivist & connectionist, collaborator & communicator, globally aware & civically engaged, ICT skilled, and financially & economically literate.

The teacher needs to attend to the demands of highly evolved learners- challenging innovators, regulating their energy & power flow , realizing complete adjustment. There is a need to appreciate and inculcate global values. There has to be added focus on input & process norms rather than mainly the output norms. Due to media implosion there is wild aggression. There is a need to develop media culture in this media crowd. Rather than the degree of degrees we need to focus on the flow of knowledge, feelings & skills. The graduates ought to be Strong Team Builder, Creative & Critical Thinker & Problem Solver, Media Prosumer, techno-savvy, info-savvy, nature-savvy, innovator, constructor & collaborator, proficient writer, reader, speaker, listener & communicator, self directed responsible worker, self realizing global citizen, multi-lingual continuous learner.

e-Teacher & e-Pathshala

The teacher ought to be fully networked with the family, locale & community, sources & media resources, conferences, curriculum documents, social bookmarking, video conferencing, BLOGs, Wikis, Podcasts, Twitters, Social network sites, photo sharing & media, moodle & flicker.

Teacher with Multiple Intelligence & Universal outlook

The teacher has to be with multiple intelligence- intrapersonal, interpersonal, visual spatial, musical, linguistic & logical mathematical. The teacher ought to be sensitive, knowledgeable, skillfull, pioneer investigator, physical, metaphysical, universal & spiritual.

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Scope of SCOPE in Indian Higher Education

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The complex structure of society has made human psyche more complex. The lack of human touch among the people living with virtual reality tending towards individualism has made the whole society sick. Being healthy is not reflected by absence of illness, but, presence of good health. Hedonic, superficial happiness has led people to adopt unhealthy behaviours and attitudes. Be it a mental issue like anxiety and depression or physical issue like obesity, everything, begins in one's cognition and behavior. Thus mental health should be made a priority in every organization and context in order to achieve a healthy physical, mental, spiritual equilibrium. Psychology as a science is evolving with the evolution of society. Application of Psychology is unlimited today. Intervention Research from Psychological perspective is necessary requirement in every context. The present article explores the scope of SCOPE, that is, Spiritual, Clinical, Organizational, Positive and Educational Psychology in Higher Education.

Spiritual Psychology

Every entity in this universe is Thy creation and abode. Spiritual psychology deals in individual as an integrated whole, universe as uni-verse, that is, harmonious resonating interrelated, interconnected, interdependent whole. It tries to explore the bonds amongst physical and metaphysical. Spiritual Psychology deals in development of balanced beings realizing heart and brain entrainment. There is optimum secretion of various neurotransmitters, such as, adrenaline, dopamine, acetylcholine, serotonin and endorphins. Adrenaline belongs to sympathetic nervous system. It provides fight and flight response. Thus, there is increased heart rate and immune system activation. It is a good predictor of happiness. Dopamine is released in the Substantia Nigra Ventral Tegmental Area of Hypothalamus. Increased level of dopamine leads to positive mood. Acetylcholine is secreted in the basal forebrain. It is responsible for motor muscle movement. Serotonin is released in the reticular formation Raphe Nuclei which is a part of brain stem. Increased level of serotonin leads to satisfaction, optimism and happiness. If decreases, then it leads to depression. Endorphins are released in the Central Nervous System & Pituitary Glands. These are peptides and released while laughing. These are feel good hormones. Our body, mind and spirit should always be in tune. When all of our sub-systems are tune then there are optimally balanced secretions. We have *SVASTHIT SVASTHYA*. Our text has its own testimony.

Clinical Psychology

Clinical Psychology deals in cases of mental health of the individuals- their diagnosis & prognosis. There are many a disorders, such as, Attention Deficit Hyperactive Disorder, Generalized Anxiety Disorder, Stress, Strain, compulsive obsessive neurosis, depression aggression, hallucination, anorexia, bulimia nervosa, psychosis. Modernization may not be civilization. Earlier people believe in simple living and high thinking. Now there is reversal of the proverb. We go on thinking round the clock, recursively, endlessly, indecisively. There is a need to train thinking. We do not know which problems we are suffering from. We go to doctors to find out what are our mental problems. Is not it strange? Clinical Psychology tries to provide suitable treatment for mental disorders.

Organizational Psychology

Organizational Psychology converges on Total Quality Management. It deals in healthy Time-Space- Personnel- Material Management. It helps a person in realizing intrinsic as well as extrinsic motivation. It utilizes synergy through complete networking. It employs human relations model, realizing healthy organization for optimum returns on investment.

Positive Psychology

Positive Psychology deals in meaningful and fulfilling life. It deals in happy, healthy and resonating life, where ideas spring, feelings flow, motor muscles create, the spirit reins and the self resonates with the rest. It deals in realizing resilience at the earliest. Positive psychology provides us a platform to be very strong to be swayed away by the negative stimuli. A strong personality is one which is not swayed away by the wild currents- fore or against. Positive psychology develops positive in-look and outlook. We do not have the rights to undermine ourselves, nor others. Every entity has its place. Everyone has its role to play. Let us learn to appreciate whole heartedly. Positive psychology helps us create healthy culture, positive ripples and currents, irrespective of who we are, where we are.

Educational Psychology

Educational Psychology is the branch of Psychology concerned with the scientific study of human development. It deals in various theories of learning. There is focus on classical conditioning ($S \rightarrow R$), as well as, operant conditioning ($R \rightarrow S$). It deals in personality as a function of heredity and environment, that is, an interaction between nature & nurture. The ultimate aim of education is development of universal beings having healthy interrelation, interdependence and healthy co-existence. Educational Psychology focuses on holistic development- cognitive, affective and psychomotor. It deals in the taxonomy of educational objectives, taxonomy of educational skills and taxonomy of affect attributes. It deals in various domains, namely, cognitive, behavioral, creative, innovative, constructive and connective. It deals with every stage of cognitive development- sensory-motor, pre-operational, concrete operational and formal operational. It is with us from transduction to induction to deduction to deduction- induction. It deals in memory, understanding and reflection. It takes us from scribbling stage through pre-schematic stage and schematic to pseudo- naturalistic and naturalistic stage. It helps us design & provide differentiated and differential inputs. There is due focus on aptitude & attitude. Educational Psychology develops and attempts to induce the learners in various fields based on the predictors of their competencies. Educational Psychology provides a wide range of experiences including instructional design, educational technology, curriculum development, organizational learning, special education, classroom management and student motivation. Educational psychology finds expression in every facet of life, in every bit of function, such as, walking, talking, meeting, thinking, smiling, laughing, eating, LSRW, communicating, sleeping, driving. It deals in life skills- self awareness, self management, social awareness, social management, critical thinking, creative thinking, decision making, problem solving, coping up with stress and coping up with emotions. It deals in all sorts of conflicts- approach- approach, approach- avoidance, avoidance- avoidance. It tries to resolve the conflict between emotions and consciousness. It deals in peace & chaos, both. Also, it keeps track of the natural, spontaneous, irregular, stormy outbursts. Educational Psychology employs a variety of Psycho-meters for measuring the status on various constructs, such as, intelligence, creativity.

SCOPE: Research & Innovation

There is a need of promoting research, innovation and excellence in all the branches of applied psychology, such as, spiritual, clinical, organizational, positive, educational. The ultimate aim of applied psychology and all the allied sciences is all round development of the universe. There is a need to transcend from Human Development Index to Universe Development Index. How to? There is a need to apply Psychology and allied sciences for realizing full, meaningful, happy, healthy and harmonious life. There is a need to explore why the beauties of the childhood are fading, why the youth is bewildered, why the old are restless, why there is

emerging chaos in the universe. Why have we entered into an era of stress and strain, tensions and obsessions, repression and depression, hostility and aggression. Masters do not have faith in servants, students do not have faith in teachers, producers do not have faith in consumers, public does not have faith in politicians, privates do not have faith in public and vice-versa. Why there are within and cross border fires? Number of mentally sick persons is significantly larger than that of the healthy persons. Psychoneurosis, blood pressure, diabetes, fast food are omnipresent. Psychology is more in the books and volumes than at the operational and functional levels. Number of mental hospitals and mental patients is significantly on the increase. Children are restless in schools, young ones are wandering on the roads, old people are restless in the ANASHRIT ASHRAMS. What is the resolve? Applied Psychology and all the allied sciences need to revive their identities and operate at the functional level. There can be amalgamation of traditional & positive psychology for promoting societal structure & dynamics. There can be prevention, corrective, adaptive and perfective maintenance of mental health employing positive psychology techniques. Eclectic Yoga- BHAKTI, GYAN, KARMA & RAJ can facilitate self realization. Clinical Psychology can relieve us of many a disease. Organizational psychology can integrate us completely holistically. Educational psychology can help us to learn to be, to learn, to do and to live together as universal beings. It can train the heads, teachers and team leaders to become first level counselors. All our scriptures have a lot to offer in the discipline of educational psychology.

Thinking Patterns

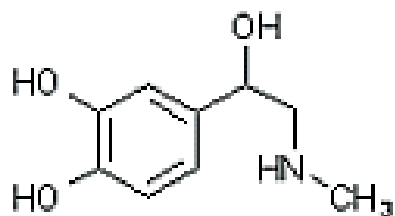
Mind has a tendency of wandering. Control on the mind demands inner control, not to be swayed away by any attraction or passion. Nothing can deviate a person with full inner control. We ought to be serene rather than turbulent, calm rather than stormy, expressive & booming rather than depressive & repressive, positive than negative, final & decisive rather than recursive & lurking, neutral rather than polar, modern rather than primitive, cultured rather than ultramodern, socio- centric & ethnocentric rather than self centric & ego centric, sharp & decisive rather than blunt & obsessive, wholistic rather than patristic, optimistic rather than pessimistic, happy rather than sad, simple rather than complex, considerate rather than rigid, social rather than unsocial, independent rather than dependent, broad minded rather than conservative, determined & active rather than idealistic & passive, logical rather than irrational, factual & theoretical rather than propositional & hypothetical, creative rather than stereotyped, pioneer than conservative & copier, confident rather than diffident, relaxed rather than stressful, focused rather than deviant, flexible rather than rigid, open rather than closed, resonating rather than stagnant & isolated, constructive & connective rather than destructive & disruptive, innovative rather than customary, resolved rather than engrossed, peaceful rather than disturbed, free rather than confined, striving rather than starving, resolved rather than recursive, final rather than obsessed, normal rather than psychoneurotic, lucid than ambiguous, fruitful than futile, innocent rather than cunning, intuitive rather than peripheral. But how to realize such a state? Thinking regulators demand healthy neurons and their interconnections, mental control, spiritual control, control on the motor muscles, simple living & high thinking. Thinking is the cause of both, peace & chaos. Thinking is trainable.

Heart Brain Entrainment

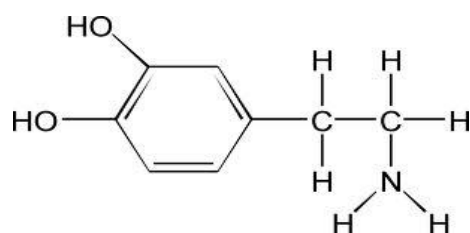
Health & happiness depend upon the dopamine adrenaline balance. Dopamine is the primary activator of the heart. Dopamine levels in the heart determine the vigor of the neural signals to the brain. Dopamine levels in the heart are determined by the amount of joy and the amount of resonance that the heart is feeling. The sheer joy of being alive is the energy that allows the heart to resonate and initiate the primary dopamine release for the heart. Dopamine does not cause joy. Joy causes the release of dopamine. The greater the joy, the greater the level of primary dopamine in the heart. Whether a person is happy or sad, he can always resonate with the sheer joy of being alive. Whether a person is in the midst of battle or in solitude, the sheer joy of living can be present behind his fear or his tranquility. Joy and the heart's ability to

resonate are very nearly the same. The former is more purely energetic, the other is the more physical manifestation of the joy energy. The core level of dopamine prepares a person, in body and brain, to be a feeling, sentient being.

Structures of Adrenaline & Dopamine



Adrenaline

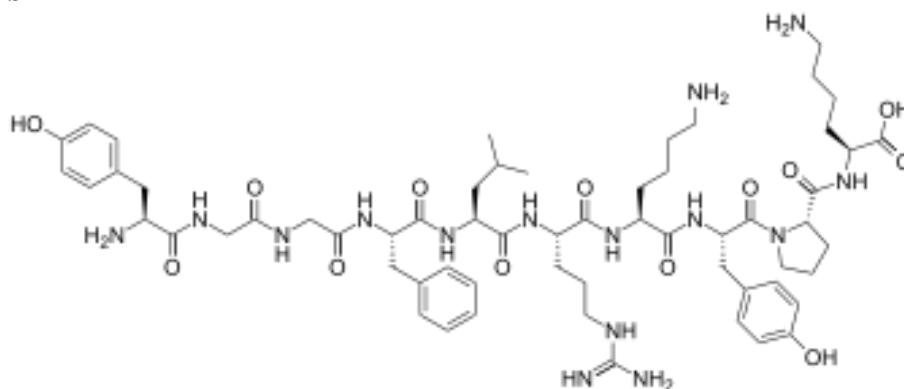


Dopamine

Beauty of Laughter

Beauty is not looks alone – it is holistic as it encompasses both physical and mental attributes. Enhancing this wholeness of self is laughter - an elixir for wellness. It helps to outwardly reflect the inner glow of good health, happiness and joy. The well being of people is largely dependent on fitness levels both physiologically and psychologically. The constant struggle to cope with enormous stressors in life takes its toll on one's appearance. Laughter reduces stress levels and stimulates the production of endorphins, natural opiates known for their relaxing effects. It also helps to release muscular tension and reduce the negative physical symptoms of stress, worry and anxiety. Laughter is a wonderful expression! When it comes from deep within it can help to release inner tensions. Laughter produces endorphins in the brain after responding to a rewarding activity according to modern neurophysiology! Laughter can be medicine for the soul!

Endorphins



Chemical structure of *alpha*-Neoendorphin (α -Neoendorphin)

Role of Tears

Shedding off the tears, sharing the sad state also relieves us of disease & discomfort & helps in realizing peace. We have basal tears, reflex tears & emotional tears. The cornea is continually kept wet and nourished by basal tears. Tear fluid contains water, mucin, lipids, lysozyme, lactoferrin, lipocalin, lacritin, immunoglobulin, glucose, urea, sodium and potassium. Lysozyme fights against bacterial infection. Reflex tears are released during irritation to the eyes say while cutting onion or pepper spray. Negative or positive emotions cause psychic tears. Emotional tears have more of protein based hormones.

Peace & Play

Arriving in the optimum state of energy keeps us calm & cool. Playing any game – Hockey, Cricket, Football, Bad Minton, Table Tennis, Lawn Tennis keeps us happy & gay. Athletics such as, Jump & race, Disc Throw, Javelin Throw keeps us fit. Climbing up hill & coming down hill helps us sustain momentum. Peace & Play are perfectly interrelated.

Peace & Yoga

Peace begins when everything else ceases to be. Peace is complete yoga at the functional level. Yoga is that ultimate state of bliss when we are integrated unit self. Peace demands Gyan Yoga, Bhakti Yoga, Karma Yoga and Raj Yoga. Peace is by realizing which we can DARSHAN entire COSMOS. Yoga is the pre-requisite for peace.

Resilience

Variability & Central Tendency or deviation & regression are the realities. It is always desirable that we realize resilience & normal state at the earliest. Sooner it is realized less damaging it is. This is an age of stress & strain. But the state of peace demands instant resilience. There are numerous pressures these days, such as, high blood pressure- low blood pressure, compulsive obsessive neurosis, depression & hypertension, which could be both self invited & environment offered. We ought to be strong enough not to deviate, if at all we deviate then there must be most efficient resilience.

Some of the focus areas

Could we focus on the areas, such as,

- Psychological First Aid
- Status of life skills in Institutes of Higher Education
- Mental Health of the people on social media
- Thinking Patterns of the Youth
- Mental Status of the Graduates
- Profiles of the Doctors of Philosophy
- Affect Attributes of the Top Administrators
- Profiles of the Teachers & Learners
- Total Quality Management (TQM) of the Educational Institutions
- Time- Space-Personnel-Management (TSPM) of the Educational Institutions
- Mental Hygiene & Learner Guidance
- Intelligence Quotient, Emotional Quotient, Spiritual Quotient, Health Quotient

- Major Depressive Disorder
- Bipolar Disorder
- Compulsive Obsessive Neurosis
- Mood Disorder
- Delusion of Grandeur
- Delusion of Paranoia
- Catatonic Behavior
- Contagious Emotions
- High Functioning Depression
- Vulnerable Hypothesis Disorder
- Trigger factors that can enable a disorder
- Employing Neuroimaging Techniques (FMRI, MRI, PET)
- Addressing Dementia
- Implications of BHAGAVAD GITA and RAMAYAN for Higher Education
- Research & innovation on the medicinal values of various plants
- Holistic development through higher education
- Indian Psychology & Indigenous Practices as focus of empirical research

Concluding Remarks

In this era we rarely re-create ourselves. We rarely have the time to converse with the self. We are lost in all forms of social media. Rarely we have the time to share our states with others. We do consult doctors for physical problems, but, rarely share mental disorders. We may be on the e-networks round the clock, but, we rarely connect with the people. Progressively our problems escalate. Now, we are a society of the alienated. Whom to share our problems with? Beauties of childhood are lost, energies of adolescents are wasted, young ones have lost directions, the old are losing peace! Who is accountable? Answer is very straight & simple. All of us! How to revive our basic nature? How to revive our own culture? Let us be our own selves. We are very good at experimentation, but, relatively poor in patenting and marketing. Our scientists need to be more dynamic. Why not to produce our own labeled medicines? When will we ban tobacco, alcohol and addictive drugs to realize healthy state? We have to have policies at the grass root level. There ought to be strict law to ban green washed vegetables and adulterated fast food. There ought to be cost effective diagnosis of the cases and prognosis for their disposition. We should have healthy and humanistic clinics to relieve us of the disease. We ought to revive all forms of Yoga. There ought to be healthy counseling centers. Every organization should have healthy climate. We should try our levels best to realize total quality management. Sooner we do away with the bureaucratic, hierarchical, conservative models of administration, better it would be. We should recourse to human relations model. We should try to revive the identity of education. It is Educational Psychology only which can bewitch the minds. The first & ultimate expectation of a human being is the pleasing self. Let us revive ourselves and rejuvenate!

Learner Driven Higher Education

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Higher Education ought to be higher through germination, incubation, innovation, creation, construction & connection. The genesis and evolution of ancient Indian Universities, namely, TAKSHSHILA, NALANDA, VIKRAMSHILA reveals that Indian Higher Education has been quintessential since then converging on the development of pioneers. The most salient feature of Indian Higher Education is that it has mostly been through reflective dialogue and collective wisdom. It believes in that it is better to be than merely to have. Higher Education cannot sustain to be higher if it is teacher designed and teacher driven. There has to be a shift from initially teacher designed and driven to progressively teacher designed and learner driven and ultimately learner designed and learner driven. Higher education convocations have to be with full & deep invocation. Finally the accelerator, brake and clutch (abc) have to be designed and operated by the youth. They ought not to be served fast food and that too ready made. They ought to develop the culture of cultivating nutritive food of their choice.

Features of Some of the Innovative Programs in India

- **Problem Solving through Participatory Approach (DAVV, Indore)**

- The Master of Computer Education (M.C.Ed.) class, DAVV, Indore was very often given a problem to be solved through a computer program.
- Number of different programs would emerge from the entire class.
- Each program was presented by one of the programmers to the rest of the class and rated by all the students on different criteria, namely, compactness of source code, fetch and execute cycle size, response time, memory used, programming discipline level and program intelligibility.
- Also, the students developed programme to calculate Kendell's Coefficient of Concordance through 'C' language. They then computed Kendell's coefficient of concordance individual criterion wise and with respect to the comprehensive criteria.
- There is a significant cognitive development through cognitively mapping the algorithms and solution to a problem. This approach cuts across students of varied profiles, simultaneously. Participatory approach may be introduced in various disciplines to enhance learning in all domains. It facilitates creative production and independent thinking. Also, it provides scope to experience and appreciate the cognitive maps of others.

- **Personalized Teacher Education (DAVV, BANASTHALI VIDYAPITH & LUCKNOW UNIVERSITY)**

- Choice of Volunteers
- Learner Centered
- Personalized Classroom Setting
- Participatory Approach
- Zero Lecture Program (ZLP)
- Freedom for what to study, how to study, when to study, where to study
- Peer Teaching-Learning-Evaluation
- Variety in the modes of presentation
- Successive Discussions
- Evaluation by Self, Peer & Teacher
- Emergence of effective teachers

The personalized teacher education program has been an autonomous program for the development of humanistic and professional teachers, employing human relations model in Time-Space-Personnel Management.

- **Development of Creative Writing Ability Amongst Students Through Participatory Approach (CASE, MSU, Vadodara)**

- Recitation of Model Poems by the Teacher in Class Situation
- Appreciation of the poem by the class and identification of the various components of creative composition
- Composition of a variety of poems by the students individually, and in groups
- Recitation of the self composed poems by the classmates and appreciation by rest of the class

Participatory approach of creative writing facilitates expression of the latent creative faculties in terms of original production.

- **Presentation in the Seminars & Conferences without Paper and PPT (DAVV, Indore)**

- Presentation of original ideas by the presenters orally independent of papers and PPTs
- Discussion in the forums through reflective dialogue
- Employing collective wisdom to arrive at emerging theses

➤ This approach has been found to be very effective

- **Designing, Development and Implementation of Time Space Personnel Management System and Learning Resources Management System (DAVV, Indore)**

Scholars at DAVV, Indore designed, developed and implemented TSPMS and LRMS for Time- Space-Personnel- Management and Learning Resources Management. These self designed and developed systems were found to be very effective for managing the Time- Table and Library.

- **Designing, Development and Implementation of a Hindi Text Editor (DAVV, Indore)**

A Hindi Text Editor, namely, BHARATI was self designed, developed and implemented by a B.C.Ed. student at the School of Education, DAVV, Indore. It was found to be very effective, in fact, more effective than the commercially available Hindi Text Editors in the markets.

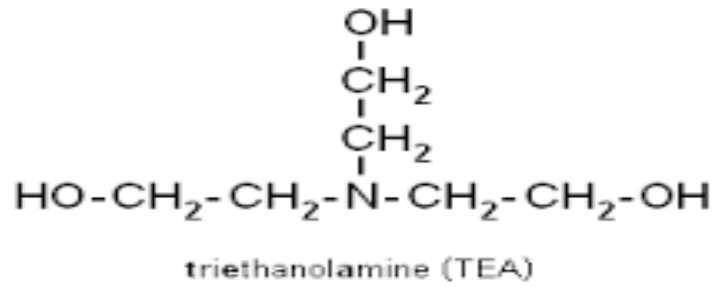
- **Wholistic Development- An illustration on Tea Preparation (CASE, MSU, Vadodara)**

For preparation of tea there is a need to gather all the apparatus and ingredients required for the tea preparation, such as, Pan, Milk, Water, Gas stove/Kerosene stove/ Electric coil/ Induction gas, Lighter, Mach box, Pair of tongs/ Cloths used for handling hot pan, Tea leaves container/Tea bags container, Sugar container/Sugar Free Tablets Container, Basil, Eliachi (Cardamom), Ginger, Black Pepper, Sieve, Tea pot, Cup and Saucer/ Tea Mug. Edible materials used in preparation of tea are, such as, Water, Dry Tea Leaves, Ginger, Cardamom, Black Pepper, Basil, Pudina, Green Tea Leaves, Sugar.

After collecting all the ingredients and apparatus for preparation of tea, there is need to exercise choice for pan. After that drinking water is collected. Then the gas is burnt with the help of lighter/match box. There is need to regulate the desired volume of the flame. After boiling water, it's time to add dry tea leaves, basil, grated ginger, black pepper, green tea leaves, Pudina and cardamom. After extraction of these things there is need to add sugar and milk. Boil for some time and pour it in tea pot, serve it in cups and enjoy Tea. This is the simple recipe for Tea.

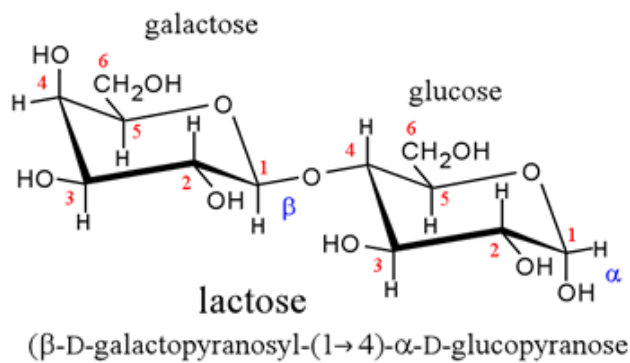
Chemical Composition of various ingredients used in TEA preparation

1. TEA (TRIETHANOLAMINE)

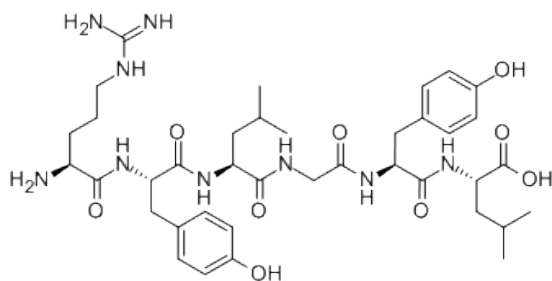


2. MILK

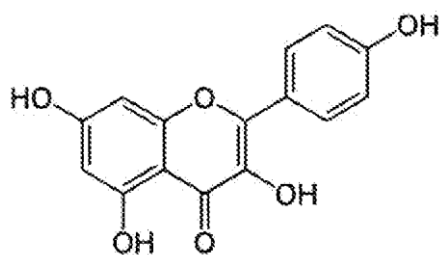
Milk contains mainly Lactose , Casein and Water



CASEIN

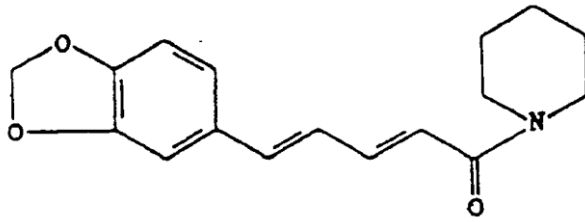


3. BASIL



Basil is a herb belonging to the mint family *Lamiaceae* often used as a seasoning in cooking. Basil is native to India and other tropical areas of Asia.

BLACK PEPPER



1-[5-(1,3-Benzodioxol-5-yl)-1-oxo-2,4-pentadienyl]piperidine

The health benefits of black pepper include relief from respiratory disorders, coughs, the common cold, constipation, indigestion, anemia, impotency, muscular strains, dental disease, pyorrhea, diarrhea, and heart disease.

Properties of materials and ingredients

a) Properties of Metallic Pan

The pan should be optimum in size. Handle of Material of Pan should be made from non-conducting insulating material. Most of the pan handles are made from asbestos. Pan metal should be such which cannot easily peel, crack, vaporize, dissolve or harbor bacteria. It should be a good conductor of heat in order to cook food uniformly, and it should be easy to clean thoroughly. Alloy can be used for best result because it has good quality of more than one metal.

b) Water

Water is a tasteless, odorless liquid. At ambient temperature and pressure, it appears colourless in small quantities, although it has its own intrinsic very light blue hue. Water has pH 7. It is a neutral medium.

c) Milk

The constituents of milk are water, lipids, carbohydrates, proteins, vitamins and minerals.

- Water:

This constitutes about 85-87% of milk. This is the main medium for the suspension of all other components.

- Lipids:

Milk is an emulsion and the lipids are found in a globular form. The main lipids present in milk are triglycerides, phospholipids and cholesterol. The triglycerides are formed of a number of fatty acids, such as, palmitic acid, stearic acid, lauric acid, and linolic acid. Lecithin, Cholin and many cerebrosides are other forms of fats present in milk. The percentage of fats in milk varies in different breeds; it may vary from 3.5-5%.

The fatty substances in milk can be separated in a solid form by applying centrifugal

force after it is allowed to get curdled. Butter, the concentrated fat of milk is an important food ingredient in human diet. Ghee is another product obtained by melting the butter.

- **Carbohydrates:**

The most important carbohydrate present in milk is lactose. It is commonly called milk sugar. Lactose is a disaccharide formed of two monomeres of monosaccharides- glucose and galactose.

- **Protein:**

Among the proteins, casine commonly called the milk protein is the most important constituent. In milk, casine combines with calcium forming calcium caseinate. For growing children casine is a very essential protein. Other proteins of milk include lactoalbumins and lactoglobulins.

- **Vitamins and minerals:**

Milk contains a number of essential mineral elements such as sodium, potassium, calcium, magnesium, iron, copper, iodine etc. Among the vitamins, milk has B complex and vitamin C and A. Even vitamin D and E are present in milk.

How milk is wholesome diet

Milk contains calcium, vitamin A, vitamin B12, iodine, riboflavin, potassium, magnesium, zinc, phosphorus, carbohydrate and high quality protein. These components make Milk a wholesome diet.

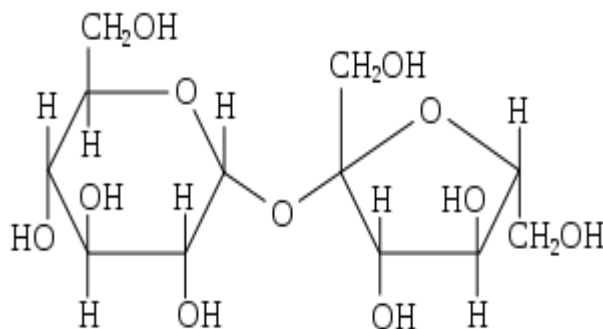
d) Sugar

Sugar is also known as sucrose. Natural source of sucrose are beetroot and sugarcane.

Sucrose is a disaccharide constituent of glucose and fructose. During the process of digestion by sucrose enzyme sucrose split into monosaccharide namely, glucose and fructose. Sugar (sucrose) found in two form i.e. powder and crystalline.

Molecular Formula of sucrose: $C_{12}H_{22}O_{11}$

Structural Formula:



Sucrose

e) Tea leaves

Compounds presents in tea leaves are polyphenols, amino acids, enzymes, pigments, carbohydrates, methylxanthines, minerals and many volatile flavor and aromatic compounds which give aroma, flavor, and taste to tea.

Effect of Milk on Polyphenols present in Tea

The compounds in Tea derived from catechins can have antioxidant effects on the body, these could have beneficial effects on cardio vascular health. Casein proteins in milk could bind to polyphenols and as a result prevent their antioxidant effects.

f) Medicinal uses of different herbs used in preparation of tea

1. Name: Ginger

Scientific Name: *Zingiberofficinale*

It is used in preparation of tea to prevent morning sickness, motion sickness, and nausea that accompanies gastroenteritis.

2. Name: Cardamom

Scientific Name: *Elettariacardamomum*

It is used in preparation of tea to prevent infections in teeth and gums, to prevent and treat throat troubles, congestion of the lungs as well as Flavoring agent.

3. Name: Basil

Scientific Name: *Ocimumtenuiflorum*

It is used in preparation of tea as Healing Power, Fever & Common Cold, Coughs, Sore Throat, Respiratory Disorder, Mouth Infections, and Headaches.

4. Name: Black Pepper

Scientific Name: *Piper Nigrum*

It is used in preparation of tea to improve digestion, stimulate appetite, and treat gastrointestinal problems, including diarrhea, dyspepsia and flatulence. It is also used to treat colds, coughs and sore throats.

5. Name: Pudina

Scientific Name: *MenthaArvensis*

It is used in preparation of tea for treatment of vomiting and nausea. It is also useful for stomach disorders and as antiseptic.

Concluding Remarks

There is a need to employ innovative approaches in Higher Education Teaching Learning, such as, participatory approaches of problem solving and personalized education. We should not blindly accept any Massive Open Online Courses (MOOCs) and Free and Open System Software (FOSS). We should carefully and scientifically employ system design considerations-build or buy, centralized or decentralized, prototype or fully functional, man or machine. We are very good at engineering, but, relatively poor at social engineering. We are very good at experimenting, but, relatively poor at patenting and marketing. Why a sizable number of our top scholars find abode abroad? Do we have no space for them? There is a need to revive & rejuvenate our Higher Education. It is education and education only which can bewitch the minds to live with peace & harmony!

Our Journey of Teacher Education

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Some of the Universities in India, both, old and new, such as, University of Mumbai, Maharashtra, University of Gauhati, Assam and Ravenshaw University in Odisha are conferring Doctoral Degrees in Education under the Faculty of Arts. Education is not even considered by them an entity and faculty. So, there is a question of identity. Education which is unconditional greatest Service in Society has not been recognized by the Service Sector in India. UPSC in India has failed to include Education as a discipline. *There is a false notion that Education has only a little core, but, more of periphery. Education suffers from the missing elements of unique discipline which are non replicable in other disciplines.* It seems that such thinking has failed to appreciate that Education is the core of every discipline. Education is interdisciplinary. All the disciplines emerge from Education and merge into Education. Education does have a unique body of knowledge, a repertoire of unique skills and attitudes and a code of conduct. The code of conduct of doctors is- *servng the humanity without considering comfort or discomfort*, whereas, the code of conduct of Teachers is- *Eternal Learning & Teaching*. The soul of a gardener resides in the seeds, the soul of philosopher resides in the mind, the soul of piper resides in the pipe, the soul of a singer resides in the voice, the soul of a dancer resides in each & every body cell, the soul of a poet wanders in the nature, the soul of a sculpture resides in the stone, the soul of a Governor resides with the public, the soul of the creator resides with the universe, the soul of a teacher wanders with the learners. Dancing crops, flowing wisdom, enchanting music, touching songs, resonating dance, immersing verses, speaking sculptures, and enlightened learners are the wonderful springs of nature. Education is a most comprehensive interdisciplinary discipline which educates the universe on what has gone by, where we are, where we want to go, and what we like to create, observing healthy, meaningful and full life. Can we estimate the energy, purity and strength of the Soul of Education? Warriors may conquer at times physically, geographically, materially, it is only Education which through knowledge can bewitch the minds and liberate the souls. We always feel proud of the teachers who taught us and who are teaching us. Their text is its own testimony. They do not require testimonials. The globe strives to emulate Indian Teachers & Learners.

Since ages the universe has been concern of Education. All were having access to Education for sharing their states. Teachers and Educationists were universally respected. Now the scenario is changing. Why Education is losing its identity? All of us have largely failed in realizing identity of Education. Rather than others seeking guidance from Education, Education is being invited to receive dictations from State & Judiciary. Arbitrary policies & Judicial over activism are likely to damage Education. There is evident identity crisis of Education. It is high time for Education to realize its Identity. The question is why the identity crisis?

There is crisis of character. Soul of Education is being killed through ruthless expansion and privatization leading to marketization of Education. Market is being perceived as the arbiter of the morality. Blind ultra modernization has resulted into the corrosion of Eastern Values. We have lost our sensitivity to the basic values & SANSKARAS. The soul provides energy, whereas, the SANSKARAS provide modus operandi, but, the unbridled marketization of Education has reduced Education to a commodity to be brought & sold mechanistically in the market. Expression without essence and laughter without resonance are worthless. Convocation without invocation is useless. Graduates & Post-Graduates, degrees of a degree are of little value. Degrees do not guarantee achievement. Achievement is a function of variety of factors in which Knowledge, not merely Degree, is one of the elements. What use is the humanity degree which does not develop decency, decorum and discipline and fails to process us as human beings? What use is the Science degree which does not reconstruct in us open minded

scientific outlook? What use are the law degrees if there is lawlessness. What use are the Political Science Degrees if we fail to develop Statesmen? What use is that Art which fails to manifest thematic creative expression? Mathematical formulas are empty & mechanistic if these fail to represent the reality. Social Science degrees which fail to produce Social & Civic Personalities and Citizens are gross wastage. What use is a Doctor of Philosophy Degree if we fail to philosophize the field? What use are the elections if we fail to find & elect Rajrishis?

Let us recall integral humanism of Sri Aurobindo & Wholistic Man of Vedic Period where the emphasis has been on wholistic education for man making- Physical, Mental, Social, Spiritual, Environmental, and finally universal being. Here we recall the efforts of Prof. T.N. Kapoor Former Vice Chancellor, Punjab University Chandigarh, who insisted that Principles & Philosophies of Education be taught even to the Commerce students.

Wonderful is the beauty of nature. Despite of the diversity, each and every form of the entities is the manifestation of the one perfect complete evolving eternal whole (*Uni-verse*, that is, *Towards One*). The Isha Upanishad says "Isha Vashyam Idam Sarvam".

Parliament of the World's Religions opened on 11 September 1893 at the Art Institute of Chicago as part of the World's Columbian Exposition.¹ On this day Vivekananda gave his first brief speech. He represented India and Hinduism. He was initially nervous, bowed to Ma *Saraswati*, the Hindu goddess of learning and began his speech with, "Sisters and brothers of America!". To these words he got a standing ovation from a crowd of seven thousand, which lasted for two minutes. When silence was restored he began his address. He greeted the youngest of the nations on behalf of "the most ancient order of monks in the world, the Vedic order of sannyasins, a religion which has taught the world both tolerance and universal acceptance." He quoted two illustrative passages from the *Shiva Mahimna Stotram*—"As the different streams having their sources in different places all mingle their water in the sea, so, O Lord, the different paths which men take, through different tendencies, various though they appear, crooked or straight, all lead to Thee!" and "Whosoever comes to Me, through whatsoever form, I reach him; all men are struggling through paths that in the end lead to Me." Despite being a short speech, it voiced the spirit of the Parliament and its sense of universality. He spoke several more times at the Parliament on topics related to Hinduism, Buddhism and harmony of religions. The parliament ended on 27 September 1893. All his speeches at the Parliament had the common theme of universality, and emphasised religious tolerance.

Complete Social Development

All the entities in this universe are interrelated and interdependent. Complete Social Development presumes wholistic universal development. Wholistic Universal Development demands each & every entity to be in healthy state & configuration having healthy congregation & constellation. Universe health, that is, health of all the constituents of the universe, that is, human beings, planets, stars, atmosphere, plants, animals and all is interrelated & interdependent. Society can be called Society where every individual self resonates with the environment generating a realm of truthfulness, compassion and forbearance emerging into Satyam Shivam Sundram. In this realm there is no space for arrogance which is felt as antithesis of etiquettes & humility. Complete Social Development demands equity of investment and income. There is immense central tendency irrespective of variability. Every one is respectful & respected. There is decency, discipline and decorum in every domain of universe. There is democracy in Ruth, rather than, mechanistically flowing with the hands count. Every raise of hand & rise of head is truly feeling & expressing. Margins integrate into the full. Where we like to possess only as much as is required to sustain happy, healthy & hilarious life. Where renunciation over powers passions, possessions and obsessions, where return on investment is measured in terms of sphere welfare, where Human Development Index is the prime index of development in the ocean of Gross Domestic Product (GDP), there resides the beauty of universe. There is a need to workout Universe Development Index inclusive of Globe Development Index. Is it within the purview of human beings? Let us search & research. Wholistic advancement demands all round development where ideas spring,

feelings flow, motor creates, soul reigns and the self springs and resonate with all in full swing!

Universe & Parliament of the World Religions

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India continues to be Universal Teacher (JAGATGURU)

It is evident through the second Indian mission to explore the moon, Chandrayaan 2. The Chandrayaan 2 composite- the single, combined unit made up of the orbiter

Vikram lander with the rover tucked away inside it – has successfully completed one of four orbital manoeuvres around the moon to bring the spacecraft within 100 kilometers of the moon’s surface. If “all spacecraft parameters are normal”, an ISRO’s most recent update announced, we have got little to worry about.

National Initiative for School Heads’ and Teachers’ Holistic Advancement (NISHTHA)

The Department of School Education and Literacy has launched a National Mission to improve learning outcomes at the Elementary level through an integrated Teacher Training Program called NISHTHA under the Centrally Sponsored Scheme of Samagra Shiksha in 2019-20. This program aims to build the capacities of 42 lakh participants covering all teachers and Heads of Schools at the elementary level in all Government Schools, faculty members of SCERTs, DIETs, as well as, officials and Resource Persons of BRCs and CRCs in all the States and UTs. With this huge coverage NISHTHA is a Mega Initiative in the entire world.

The training will be conducted directly by 33120 Key Resource Persons (KRPs) and State Resource Persons (SRPs) identified by the State and UTs, who will in turn be trained by 120 National Resource Persons identified from the NCERT, NIEPA, KVS, NVS, CBSE, Non- Government Organizations and UNICEF.

The aim of this training is to motivate and equip teachers to encourage and foster creative constructive & connective critical thinking in students, handle diverse situations and act as PRATHAM Counselors. They will be oriented to develop their skills on various aspects related to learning outcomes, competency based learning and testing, Learner Driven Pedagogy, School Safety & Security, Personal-Social Qualities, Inclusive Education, ICT in teaching- learning including Artificial Intelligence, health & well being including Yoga, Initiatives in School Education including Library, Eco Club, Youth Club, Kitchen Garden, School Leadership Qualities, Environmental Concerns, Pre- School, Pre- vocational Education and School Based Assessment in a joyful learning manner.

The modules developed and designed for this training program including aforesaid concerns by the NCERT and NIEPA have been shared with NGOs, namely, Kaivalya Foundation, Tata Trust, Azim Premji Foundation and Aurobindo Society.

Need to Emulate Indian Teachers

We need to emulate our teachers- their gestures & postures, smiles & laughter, knowledge, skills & competencies, sensitivities, interests, values, attitudes & philosophies, teaching styles & learning styles, creative, constructive and connective faculties, research & reason, problem solving abilities and meta physical spiritual realm. We feel proud of our teachers. We need to dive deep into the depth of their lives & styles. We learnt the schemas of Hindi alphabets through the drawings on earth with the fingertip and the mathematical tables through chorus songs in circles. We learnt writing on the wooden plates (*TAKHATIS*) with *Indian Pen & Ink Pot (KALAM DAWAT)*. We learnt to produce the schemas of *English Alphabets through G Pin in a four lane note book*. Our all the subject teachers are experts in their domains. All the disciplines are full of essence. Our class teachers are impersonally personalized. They are used to tune their teachings to the profile of each and every learner. They are used to keep track of every learner. They are used to provide differentiated differential inputs even in the class setting. Progressively we are moving to the realm of Augmented Reality, Virtual Reality, and Quick Responses (ARs, VRs and QRs). There are advancements from text editors to e-pubs, wherein, there is ample scope for text editing, audio editing and video editing- all in one. All of our text books are being energized as open pages pointing to supportive audios, videos, texts, images and 3d apps. We have progressively entered into the era of Free and Open System Software (FOSS). We are offering e- modular courses at all levels of education through SWAYAM. We have e- repositories in the form of NROER, that is, National Repository of Open Education Resources. We are offering ETV programs round the clock through KISHORE MANCH.

Need to Relocate Teacher Education

The altruistic purpose of Teacher Education has been significantly lost. There is a need to strengthen Teacher Education at all levels. Reminder of our identity through our own lyrics relocates us to our pure & true identity. Following are the reflections on some of the issues concerning Teacher Education in India.

Institutional Inertia

Due to divergence of State, Society, Judiciary and Education there is institutional inertia. Incubation, innovation, creation, construction and connection are the products of Peace, patience and perseverance. It should be ensured that the educational hub, political hub and economic hub are kept separate from each other. Earlier the Society was governing the Society, then the State started governing the Society, now the Economy is overarching, both the State & Society. The private & corporate sector has more of commercial motive. Education has been largely commercialized. Return on investment is being estimated in terms of material profit rather than in terms of all round development.

Brand Inequity

There is Public Private Dichotomy in Teacher Education. There is a pathetic indifference in Public Sector institutions and rampant commercialization in Private Sector. The Teacher Education Degrees conferred by the various universities and institutions are non-comparable. If the inputs and processes are evidently wanting, then how can the quality of the product be ensured. What could be greater loss than Educational institutions questioning the legitimacy of their own products?

Quality Crisis

There are problems of quality perception, quality scaling and quality differentiation in Teacher Education. There are wide gaps between expected and actual quality. This gap is widening day by day. This is exemplified by the successive entrance tests for higher level, be it Graduate, Post-Graduate or Doctoral Level. There has to be adequate focus on all the systemic parameters- input, process and output.

Overgrowing Establishment

Establishment has overgrown enrollment in most of the Teacher Education Programs. But, at the same time there is uneven distribution of the Teacher Education Institutions. Teacher Education Regulations, Norms and Standards though latest visited during 2014, have further scope for perfection. There is a need to have demand and supply estimates. Blanket "NO" and even Blanket "YES" can be grossly harmful in the Public Interest. The States need to justify, substantially, case-wise their stand for objection or no objection with due respect to the establishment of Teacher Education institutions.

Mismatching Teachers

Merit is destroyed due to mismatches between Teacher Educators and Teacher Trainees. Quality teachers can be developed through skilled and competent Teacher Education professionals who have passion for profession. There should be no compromise with the standards and norms.

Poor Integration of Skills

The term Skill has become a misnomer, particularly, in Education. There is rare sensitivity to the taxonomy of educational skills. Despite research and publication there is rare expression at the functional level. All the skills, such as, Life Skills, Techno-pedagogic skills, Techno-Savvy skills, Info-Savvy skills, Emotional Skills, Human Development skills, Spiritual Skills need to be integrated in Teacher

Education.

Fading Agriculture, Horticulture, Sericulture and Honeybee Culture

Agriculture is fading day by day. The most fertile lands have gone barren due to chemical fertilizers & incompatible farming. Horticulture is going down because of land conversion. Sericulture is also losing its grace. The population of honey bee is reducing significantly because of deforestation. There is a need to revive agriculture, horticulture, sericulture and honeybee culture.

Alienated & Incompatible Modes of Education

There is little parity amongst various modes of education, such as, distance mode, e-mode, and face to face mode. Distance mode is diluted, e-mode is in infancy, whereas, the face to face mode is stagnant. There is no network within & amongst the various modes of Teacher Education. These are functioning more or less in isolation.

Little contribution to Higher Education

Teacher Education has not been in a position to come out of School Education. It has made very little contribution to Higher Education. Educationists have been over obsessed with the School Education intensively for complexity, enormity, and the large number of the schools and students. But, the higher education is being neglected.

Philosophers in & Philosophies out

No Philosophy is of eternal value because each idea is propounded within the limitation of time and space. Since the interplay of space, time and matter changes, it calls for development of new set of theories, which should be identified by examining the fusion of old with the new or discerning a new direction which defies the known patterns. In either the case, a new theory is called for to provide guidance to the new developments. Old theories and old philosophies, particularly, in Social Sciences are going obsolete. There is a need to build problem specific instantaneous theory.

Disappearing Culture of the ARYAVRATTA

We talk a lot of our rich cultural heritage, but, in fact the culture of the ARYAVRATTA is disappearing. How many of us go through our VEDAS & UPANISHDHAS? How many of us internalize SHRIMADBHAGVADGEETA? How many of us listen to the BANI- NAAM JAPNA, VAND CHHAKANA, KEERAT KARNI? How many of us observe SARVODAYA & ANTODAYA? How many of us believe in ANEKANTVAD & SHAYADVAAD? Where have we lost the ASHTHMARG of Buddha? How many of us are really sensitive to the pre-amble of our own Indian Constitution? What is the status of the eternal values of Truthfulness, Compassion and Forbearance? We talk a lot of VASUDHAIV KUTUMBKAM, but, how many of us are universal beings? Full, meaningful, happy healthy and resonating life demands revival of the culture of the ARYAVRATTA.

Domain Pedagogy Mismatches

There are mismatches between the subject and pedagogy. We talk a lot of Technology Pedagogy Content Knowledge (TPCK), but, there is rare expression. We talk a lot of Open Education Resources (OERs) and Free and Open System Software (FOSS), but, where are the characteristics, ethics and expression? We talk a lot of Augmented Reality and Virtual Reality, but, where is the AR VR culture? Subject specific differential pedagogy demands scientific bases, ethics and attitude.

Identity Crisis

Teachers are lost in the multitudes of children starving & striving for knowledge. Indian Teachers have been Universal GURUS. But, where are largely those GURUS now? We need to revive and rejuvenate our knowledge, skills and attitudes. We need to innovate & renovate.

Rare Innovations

Novel ideas die because of non-incubation. Personalized Teacher Education, Wholistic Teacher Education, Specialized Teacher Education, and even Integrated Teacher Education are rarely found because we don't have a capacity to tolerate repeated failures arising out of experimentation. One shot success is a fairy tale and not the reality of life. The society and its institutions must have the capacity to tolerate genuine mistakes committed inadvertently during the course of innovation.

Stake Holders Non-alignment

Different parties to education champion their cause by becoming the so called stake holders without having regard to the needs, urges and aspirations of othe stake holders. Consequently, the system is unduly stressed, instead of making it resilient enough to deliver man making education. State indifference and displeasure, Judicial concern and activism, Privatization and commercialization, Public hope and failure, disregard and disrespect for Education are easily evident.

Inadequate Technology Infusion

Teacher Education Programs are largely traditional. Pace of modernization is very slow. We have not yet been in a position to infuse the technological innovations for transacting the education. We have more of technology crowd than culture.

Little Choice Base

Options are not substitutes for Choice Based Education. Choice of whom- State, Society, Community, Students, Teachers, or all? There are differences amongst, individual, institutional, State, National, Continental and Global objectives. The issues involved relate to the systemic correction, as well as, developing the right attitudes to make it a success. Though we have introduced optional areas in Teacher Education, but the choice is very limited. There is a need to employ CBCS in Teacher Education, which can be realized through e-platforms, and amalgamation of various modes, such as, F2F, Distance and Electronic. Choice base demands plenty of sources & resources. There is a need to introduce super market in Education.

Miserable Research Scenario

Research in Education is replicate and repetitive devoid of freshness, either of problem or of approach or of methodology. The national agenda for Research needs to be developed in alignment with the developmental objectives. A prospective plan for research and innovations should be framed with regional and national developmental priorities. The Research Methodology must be compatible with the local problems. There is a need to be innovative. There are mismatches between research trends and problems. Regulatory mechanism to tone up the Research Quality needs to be evolved. There is a need to evolve Research Quality indicators. There is a need to evolve social sciences compatible indigenous Research Methodology. Philosophical & Historical Studies are very rare. There is more of Quantitative Research than Qualitative. There is more of descriptive and evaluative research than

suggestive. There is more of borrowed methodology than indigenous. Taxonomy of Research needs to be evolved.

Vision & Mission Mismatches

University of Teacher Education has come up at Chennai. IITE has been established in Gujarat. Private Teacher Education Universities are also coming up. But, there are evident mismatches amongst Vision, Establishment, and Mission.

Non-Scientific Manpower Planning

There are demand and supply imbalances in Teacher Education. Appreciable attempts have been made for manpower planning. But, the manpower planning still needs to be done more scientifically. It is expected of the various States that these play active role in manpower planning.

Illusive Laboratories

The various laboratories of the Teacher Education institutions, namely, Science Lab, Psychology Lab, Guidance & Counseling Lab, Educational Technology Lab, Computer Lab, and Language Lab are either not there or are mostly in very bad states.

Insufficient Practice Teaching

Though a sizable number of innovative approaches of teaching – learning have surfaced, such as, participatory, wholistic, activity based, constructivistic, interdisciplinary, but the practice teaching is largely primitive. Bloom's Taxonomy of Instructional objectives has become more or less stagnant. There is a need to enhance the taxonomy, by further differentiating and adding domains. The lesson designs ought to be comprehensive of all the domains. There is only a little theory practice nexus. Experimenters, as well as, problems are many, whereas, the labs are wanting.

Over Activism of Distance/Open Universities

Some of the distance and open universities have become over activists in the context of Teacher Education. These have a notion that they can open their Teacher Education Extension Centers anywhere. To give birth to infinite is their Right. But, who will rear the babies. Such distance and open universities have resulted into the dilution of Teacher Education.

Rare In-Service & Continuing Teacher Education

Our in-service and continuing Teacher Education is very rare. Most of the IASEs, CTEs and SIETs have gone defunct. Refresher courses are largely for name sake. Adequate provisions need to be made for continuous professional development of teachers. There ought to be periodic Teacher Appraisal at all levels. Anyone, anywhere, anytime should have access to learning resources.

Invalid Recognition & Accreditation

There are questions on Recognition of Teacher Education institutions. There are questions on inputs & processes of Teacher Education. There are questions even on Accreditation of Teacher Education institutions. Escola Normal of Goa was much better established during

Portuguese Period than the most recent Modern Teacher Education institutions in India. Nalanda was having a much better profile and grade than the Highest Graded Modern Universities.

No Teacher Education Policy

There is no Teacher Education Policy in India. But, who will formulate Teacher Education Policy? To preserve the identity and sanctity of Education, it is high time that we introduce Indian Educational Services. It is unfortunate that the Education is not even considered as an entity.

Fault finding Tendency with Teacher Education

Every fault of Teacher Education is attributed to the National Council of Teacher Education. Rather than finding faults let us try to meet the gaps between our Policies and Programs, Vision and Mission, Wish and Will.

Decreasing Professional Competency of Teachers

There is a perceptible decrease in professional competency of teachers. Despite induction of the persons in Teacher Education on predictors of professional competency, such as, social sensitivity, general mental ability, general language ability ICT Skills & Competencies and teaching aptitude there is evident decrease in the professional competency.

Concluding Remarks

The foregoing analysis highlights the malaise plaguing the Indian Teacher Education System. It calls for revolutionary changes. There should be open forums and public debates on Teacher Education Policy. We have been treating our Teacher Education very arbitrarily. From one year B.Ed. to two year B.Ed. From one year M.Ed. to two year M.Ed. From independent Teacher Education to integrated (ITEP). In Kurukshetra University Kurukshetra, Haryana, India where initially Integrated Teacher Education Program B.A. B.Ed. was designed, developed and implemented; the independent B.Ed. pass outs were found to be higher on cognitive abilities, attitudinal disposition and psychomotor skills than the products of the ITEP, that is, B.A. B.Ed. The concern is that any policy formulation should have sound theoretical base. How long the culture of Para Teachers, SHIKSHAN SAHAYAKS and Temporary Teaching Assistants will continue to be there in Indian Education? We ought to do away with adhocism in Education. We need to strengthen, both, the pre-service and in-service Teacher Education. Rather than superimposing technology there is a need to integrate technology in education. Rather than dictating teachers, the constructivist faculties of the teachers- germination, incubation, innovation, creation, construction and connection should be promoted and respected. The services of the teachers ought to be fully respected. Bureaucrats should abstain from employing mechanistic expressions with educationists. Teachers can help revive and rejuvenate the peace & prosperity of the modern society to facilitate full meaningful and healthy life.

Sarvepalli Radhakrishnan (5 September 1888 - 17 April 1975)

One of the India's most distinguished twentieth century scholars of comparative religion and philosophy, after completing his education at Madras Christian College in 1911 , he became Assistant Professor and later Professor of Philosophy at Madras Presidency College then subsequently Professor of Philosophy at the University of Mysore (1918-1921); the King George V Chair of Mental and Moral Sciences at the University of Calcutta (1921- 1932) and Spalding Professor of Eastern Religion and Ethics at University of Oxford (1936-1952) by which he became the first Indian to hold a professional chair at the University of Oxford. He was Upton Lecturer at Manchester College Oxford in 1926, 1929 and 1930.

In 1930 he was appointed Haskell lecturer in Comparative Religion at the University of Chicago.

His philosophy was grounded in Advaita Vedanta , reinterpreting this tradition for a contemporary understanding. He defended Hinduism against “uninformed western criticism”, contributing to the formation of contemporary Hindu identity. He has been influential in shaping the understanding of Hinduism, in both India and the west, and earned reputation as a bridge builder between India and the West.

Sarvepalli Radhakrishnan was awarded several high awards during his life, including a knighthood in 1931, the Bharat Ratna, the highest civilian award in India, in 1954, and honorary membership of the British Royal Order of Merit in 1963. He was also one of the founders of Helpage India, a non profit organization for elderly underprivileged in India. Radhakrishnan believed that “teachers should be the best minds of the country”. Since 1962, his birthday has been celebrated in India as Teachers’ Day on 5 September.

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Indian Teacher Education: Whither To!

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There has been evident degeneration of Indian Teacher Education, more so, during the previous decade, that is, 2010-2020. The first blow on the Teacher Education was when the MHRD tried to supersede the NCTE during 2011. The second blow was when the Journals being published by the NCTE, namely, Teacher Support, ANVESHKA, Indian Journal of Teacher Education, though substantive, were abruptly stopped by the NCTE during 2015. Only God knows which school of thought dictated such an action. The intent of the present note is to revive & rejuvenate the Indian Teacher Education. Here are some suggestions.

Suggestions for the Revival & Rejuvenation of the Indian Teacher Education

1. An M.Ed. degree holder is quite competent for teaching pure education, as well as, pedagogy. The NCTE should file a writ in the Supreme Court against the High Court Order Verdict that the M.Ed. degree holders are not competent to teach pure education, that is, B.A. Education & M.A. Education. An M.A. Education is quite competent to teach the foundation/core courses of Teacher Education. M.A. (Education) and M.Ed., both, have their established identities to offer to the field of Teacher Education.
2. The NCTE should evolve norms for a B.Ed. & M.Ed. integrated program.
3. Teacher Education- Sequential & Integrated, both, should go on. There should be no moves to switch over from the sequential to integrated.
4. We should do away with TET, TAT, NET and SLET by duly focusing on all the systemic parameters- input, process and output. This in fact is undermining & disowning the degrees earned.
5. All the Teachers and Teacher Educators should be competent in ICT with respect to the entire Education System.
6. There should be an immediate shift from Teacher Driven Pedagogy to Learner Driven Pedagogy.
7. Innovative approaches, such as follows be employed in Teacher Education:
 - a. Personalized Teacher Education
 - b. Wholistic Teacher Education
 - c. Inter-disciplinary Teacher Education
 - d. Constructivist & Connectionist Approaches
 - e. Participatory Approach of Problem Solving
8. Foolproof mechanisms be evolved for recognition of the Teacher Education Institutions.
9. Criteria & mechanisms be evolved for valid assessment & accreditation of the Teacher Education Institutions.
10. Teacher Education should be supplemented with the e- Modular Approaches at all levels.

11. The regional committees of the NCTE should be very efficient in deciding the cases. There ought not be undue delay in deciding the cases which is pretty evident at present.
12. There is an immediate need for Scientific Manpower Planning in Teacher Education.
13. There is a need to develop digital culture in India. Digital blindness could be self killing.
14. Progressively there is a craze for OERs, MOOC, Augmented Reality & Virtual Reality. The characteristics of all these ought to be fully established and utility ensured.
15. There is a need to revive ancient Indian Teacher Education, such as, that of Escola Normal Goa.
16. There is a need to modernize Indian Teacher Education, such as, from F2F to e-Teacher Education.
17. The NCTE should revive the publication of its journals without further loss.
18. Live Countrywide Telecasts on Teacher Education be the regular feature in India.
19. There ought to be added focus on Inclusive Teacher Education.
20. Every lesson design for Teacher Education should delineate objectives with respect to all the domains (Cognitive, Affective & Psychomotor).
21. The entire taxonomy of Educational Skills needs to be integrated in Teacher Education. (Appendix-1)
22. Shrimadbhagwadgeeta should be included in the Philosophical Foundations of Teacher Education.
23. There should be dedicated Teacher Education Policy in India.
24. There should be ample emphasis on developing Humane & Professional Teachers.
25. Common Wealth Consortium of Teacher Education should be established in India. (Appendix-2)

Appendix-1

TAXONOMY OF EDUCATIONAL SKILLS

Taxonomy of Educational Skills has been presented under the following 14 Domains:

1. Self Development Skills
2. Social Skills
3. Life Skills
4. Critical Thinking & Training Thinking Skills
5. Research Skills
6. Constructivist & Connectionist Skills
7. Systems Thinking Skills
8. Information Age Skills
9. Leadership, Administration & Management Skill
10. Spiritual Development Skills
11. Yoga Skills
12. Wholistic Development Skills
13. Inclusive Education Skills
14. Universal Becoming Skills

1. SELF DEVELOPMENT SKILLS

Category- I: Self Development Skills

- a. Monitoring one's own learning needs.
- b. Locating appropriate resources.
- c. Transferring learning from one domain to another.

2. SOCIAL SKILLS

Category-II: Interpersonal & Collaborative Skills

- a. Demonstrating Networking & Leadership
- b. Adapting to Varied Roles & Responsibilities
- c. Working Productively with others
- d. Exercising Empathy
- e. Respecting Diverse Perspectives

Category -III: Communication Skill

- a. Sender Analysis
- b. Message Analysis
- c. Receiver Analysis
- d. Medium Analysis
- e. Communication Analysis

Category-IV: Social Responsibility

- a. Acting Responsibly
- b. Demonstrating Ethical Behavior in
 - Personal life
 - Workplace
 - Community

Category- V: Human Relation Skills

- a. Decency
- b. Decorum
- c. Discipline
- d. Empathy
- e. Sharing
- f. Fellow-Feeling
- g. Politeness
- h. Peace & Harmony
- i. Healthy Competition

Category VI: Emotional Skills

- a. Self Awareness
- b. Self Management
- c. Social Sensitivity
- d. Social Management

Category VII: Adjustment Skills

- a. Skill of Home Adjustment
- b. Skill of School Adjustment
- c. Skill of Social Adjustment
- d. Skill of Emotional Adjustment
- e. Skill of Health Adjustment
- f. Skill of Symbiosis

Category- VIII: Human Development Climate

- a. Trust
- b. Risk Taking
- c. Openness
- d. Reward

- e. Responsibility
- f. Support
- g. Feedback
- h. Team Spirit
- i. Collaboration

Category IX: Citizenship Skills

- a. Sovereign
- b. Social Sensitivity
- c. Learning about Community
- d. Secularity
- e. Democratic
- f. Public & Republic
- g. Leadership
- h. Management
- i. Cooperation & Collaboration
- j. Participation Skill

Category- X: Accountability & Adaptability

- a. Exercising personal responsibility in personal, workplace & community contexts;
- b. Setting & meeting high standards.

3. LIFE SKILLS Category-XI: Life Skills

- a. Self Awareness
- b. Empathy
- c. Interpersonal Relationship
- d. Effective Communication
- e. Critical Thinking
- f. Creative Thinking
- g. Decision Making
- h. Problem Solving
- i. Coping up with emotions
- j. Coping up with Stress

4. Critical Thinking & Training Thinking Category- XII: Critical Thinking Skill

- a. Analyzing
- b. Reflecting
- c. Querying Evidence
- d. Conjecturing Alternatives
- e. Drawing Conclusion
- f. Stating Results
- g. Justifying Procedures
- h. Presenting Arguments
- i. Self Regulation

Category XIII: Training Thinking

- a. Depressive to Booming
- b. Non-Pathological to Pathological
- c. Invalid to Valid

- d. Polar to Null
- e. Ego-centric to Socio-centric
- f. Obsessive to Final
- g. Partistic to Wholistic
- h. Non-sensible to Sensible
- i. Traditional to Modern
- j. Pessimistic to Optimistic
- k. Crooked to Straight
- l. Rigid to Flexible
- m. Unsocial to Social
- n. Dependent to Autonomous
- o. Narrow to Broad
- p. Practical and Theoretical
- q. Non-Technical to Technical
- r. Non-Logical to Logical
- s. Non-Imaginative to Imaginative

5. RESEARCH SKILLS Category-XIV: Research Skills

- a. Skill of identifying problem
- b. Skill of formulating Problem
 - Developing Conceptual Framework
 - Skill of Reviewing & implication
 - Skill of Research Questioning
 - Developing Rationale
 - Constructing Statement
 - Enunciating Objectives
 - Formulating Hypotheses
 - Operationlization/Explanation of Terms
 - Deciding Research Type
 - Research Designing
 - Population & Sampling Techniques
 - Specifying Delimitation
 - Constructing/Selecting Tools & Techniques
 - Laying down Data Collection Procedure
 - Working out/ Deciding Data Analysis Techniques
 - Interpreting Analyzed data
 - Formulating Findings
 - Discussion Mechanism
 - Converging into Theses
- c. Building Theory

6. Constructivist & Connectionist Skills Category-XV: Constructivist Skills

- a. Engagement
- b. Germination
- c. Incubation
- d. Innovation

- e. Creation

Category-XVI: Connectionist Skills

- a. Interpretation of units
- b. Activation of the network of units
- c. Learning Algorithm
- d. Recurrent Neural Networking
- e. Evolving continuous, dynamic systems approaches

7. Systems Thinking

Category-XVII: Systems Thinking

- a. Cognizing all the parameters
- b. Establishing interrelation & interdependence
- c. Realizing Integrated Whole
- d. Ensuring Efficiency
- e. Ensuring Cost Effectiveness

8. Information Age Skills Category-XVIII: Info-Savvy Skills

- Asking
- Accessing
- Analyzing
- Applying
- Assessing

Category-XIX: Techno-Pedagogic Skills:

- Media-Message Compatibility
- Media Designing
- Integration of message, media and modes
- Proximity of Message Forms
- Media Language Proficiency
- Media Choice
- Media Credibility & Message Authenticity

Category-XX: Digital Skills

- Functional Literacy skills: Use of images, graphics, videos, charts and visual literacy.
- Scientific Literacy skills: Understanding of both theoretical and applied aspects of science and mathematics.
- Technological Literacy skills: Competence in the use of information and communication technologies.
- Information Literacy skills: Ability to find, evaluate and make appropriate use of information, including via the use of ICTs.
- Cultural Literacy skills : Appreciation of diversity of cultures.
- Global Awareness skills : Understanding of how nations, corporations and communities all over the world are interrelated.

Category – XXI : Open Education Resourcing

- Open Education Resources for Learners
 - I. Learning- Content (geogebra, google earth)
 - II. Creativity (hot potato, C map)
 - III. Evaluation (R-campus & Mahara)
- Open Education Resources for Teachers, Teacher Educators & Facilitating Learning
 - I. Learning Management System (Moodle & Wiki spaces)
 - II. Teacher Managed Communication Platforms (Classroom 2.0 & Web Quest)
 - III. Statistical Tools for data processing

- V. e-books
- VI. e-News Letters
- VII. Webinars & Web Conferencing
- VIII. WBI

9. Leadership, Administration & Management Skills Category XXII: Creative Leadership

Skills

- a. Socio-centric rather than ego driven
- b. Empowers the people to make decisions rather than take decisions
- c. Listen oriented than tell oriented
- d. Pulls the organization towards a vision
- e. Listens to intuition
- f. Generates lasting commitment
- g. Open minded than opinionated
- h. Teaches importance of self responsibility rather than teaches subordinates to take directions
- i. Models self responsibility rather than in a self protect mode
- j. Knows, relaxing control yields results rather than is afraid of losing control
- k. Focuses on building on strengths rather than finding & fixing problems.
- l. Teaches how to learn from mistakes rather than quick to fire those that fail

Category: XXIII: Administration Skills

- a. Planning
- b. Organizing
- c. Staffing
- d. Coordinating
- e. Budgeting

Category XXIV: Time Management

- a. The ability to Say “No”, Learning to Say “No”, How to Say “No”
- b. Spacing Things Out; do not procrastinate
- c. Using Social Time Wisely
- d. Prioritizing and Re-prioritizing constantly
- e. Keeping your health/sleep/exercise in check

Category- XXV: Key Skills for Every Manager

- a. Leadership and People Management
Attract, retain, motivate, coach and develop team members for high performance.
- b. Communication Skills
Communicate, present, assert, speak senior management language
- c. Collaboration Skills
Influence, build relationships, manage conflicts
- d. Business Management Skills
Understand strategy, business functions, decision-making and workflow
- e. Finance Skills
Budget, forecast, manage cash flow, understand financial statements, manage business metrics
- g. Project Management Skills
Plan and manage successful projects, manage risks, costs, time and project teams

10.Spiritual Development Skills

Category XXVI: Spiritual Development

- a. Religiosity
- b. Knowledge of Soul
- c. Quest for life values
- d. Conviction, Commitment & Character
- e. Happiness & Distress

- f. Brotherhood
- g. Equality
- h. Acceptance & Empathy
- i. Love & Compassion
- j. Flexibility
- k. Leadership in Educational Change

11. YOGA Skills

Category XXVII: Yoga Skills

- a. Yama or Eternal Vows: Ahimsa, Satya, Asteya, Aprigraha & Brahmacharya
- b. Niyama or Observances: Saucha, Santosha, Tapas, Savdhya, Ishvarapranidhana
- c. Asana: Firm, Comfortable Meditative Posture
- d. Pranayama: Regulation of the Vital Force
- e. Pratyahara
- f. Dharna
- g. Dhyana
- h. Samadhi

12. Wholistic Development Skills Category XXVIII: Wholistic Education Skills

- a. Subject Knowledge
- b. Inter-disciplinary
- c. Environmental Attitude
- d. Health Development
- e. Emotional Development
- f. Spiritual Development
- g. Integrated Development

13. Inclusive Education Skills

Category XXIX: Inclusive Education Skills

Various sets of Skills are required for realizing inclusive Education including all the children, such as:-

- a. Attention Deficit Hyperactive
- b. Compulsive Obsessive Neurotic
- c. Visually Challenged
- d. Hearing Impaired
- e. Mentally Retarded
- f. Deaf, Dumb & Autistic
- g. Beta Thal Major & Sickle Celled
- h. Gifted
- i. General

14. Universal Becoming Skills

Category XXX: Universal Becoming Skills

- a. Relating Self with all the entities
- b. Treating Nature as a Source
- c. Realizing Resonance amongst all Entities
- d. Realizing Universal Development Index (UDI)

Appendix- 2

(www.cwcte.org)

Common Wealth Consortium of Teacher Education is the Consortium of Institutions and individuals for Teacher Education. It is a self-managing network of educational bodies that play a substantive role in the field of Teacher Education.

Join Us!

Common Wealth Consortium of Teacher Education (CWCTE)

It is the Consortium of Institutions and individuals for Teacher Education. It is a self-managing network of educational bodies that play a substantive role in the field of Teacher Education.

CWCTE aims at assembling a diverse coalition of partners to formulate questions worth asking, contribute to Teacher Education which is relevant in the contemporary contexts, helps in understanding Teacher Education mechanisms, promotes holistic learning and highlights their policy implications worthy of action.

The consortium is proposed entirely as a voluntary effort with its secretariat at suitable place. The member institutions and individuals shall be required to contribute towards its activities. It will strengthen networking with the apex national agencies, such as, NCTE, UGC, NCERT, ICSSR, AICTE, AIU, NUEPA, CASE, CIIL, EFLU, HBCSE and also at the international level with various institutions and agencies of the Common Wealth Countries.

CWCTE shall be a non-profit forum consisting of institutions organized and operated for educational and professional purposes. An institution shall be eligible for membership if it has made a definitive, substantial, and continuing commitment to a credible Teacher Education or to CWCTE goal to facilitate high-quality Teacher Education. Specifically, the Consortium seeks to become an intellectual center that will maximize the potential of Teacher Education and foster the development of networks of collaboration and support among educationists.

AIM/GOAL

The broad goal of the CWCTE is to strengthen Teacher Education.

Our shared goal is to provide powerful tools for data-driven Teacher Education policy research, evaluation, and implementation. It is dedicated to improving Teacher Education through conducting and disseminating various Teacher Education Programs &

Innovations. By connecting the professional expertise and practical wisdom of Teacher Education Practitioners', the agenda could be set so that results are useful in decision-making and program development

THE MISSION

The mission of CWCTE is to engage key stakeholders and experts in high quality Teacher Education for the benefit of Teacher Education across all the 52 Common Wealth Countries. The consortium seeks to answer contemporary Teacher Education policy questions. It shall provide research-based evidence to policymakers and administrators and inform its members on the national policy initiatives for improving Teacher Education.

This is proposed to be carried through the processes of:

- **contributing to the quality of Teacher Education of the Common Wealth Countries through mutual linking and sharing high - level knowledge and experience.**
- **shaping the consortium as an influential, dynamic and responsive network that supports the individual and organizational interests of its members.**
- **representing the interests of the member institutions in international Organizations and networks.**

OBJECTIVES

To promote quality Teacher Education through:

- **meta-analysis of research studies undertaken in Teacher Education and observe trends in the processes /approaches and findings of the studies.**
- **design of strategies for utilization of the findings to policy formulation and implementation, improving effectiveness of Teacher Education both in the synchronous and asynchronous modes, increasing efficiency of various educational procedures.**
- **promoting collaboration among different institutions/ agencies both within the country and abroad for undertaking multifaceted and multiagency researches and utilization of their findings with the aim of enhancing understanding of different concepts, theories and phenomena of Teacher Education.**
- **providing a forum for exchange of information, holding discussions on the quality and relevance of studies and identification of priority areas for future research in Teacher Education.**

More specifically, functions of the CWCTE are envisaged as follows:

- **Coordinating Teacher Education infrastructure across institutional campuses and developing new, shared resources and services amongst the Common Wealth Countries.**
- **Sharing the sources & resources of Teacher Education amongst all the Common Wealth Countries.**
- **Enhancing the visibility and impact of Teacher Education through publicity, advocacy and implementation amongst the Common Wealth Countries.**
- **To strengthen the Teacher Education through Management Information System Series through Manpower Planning, Infrastructure, Time-Space-Personnel Management, Foundation & Core Courses, Special Areas, Modes of Transaction, Evaluation, Placement & Promotion.**
- **To strengthen Teacher Education at all levels in all phases - Pre-service, Induction & In-service.**
- **To strengthen the e-PATHSHALA at various levels of Teacher Education right from ECCE through Higher & Continuing Education.**

STRATEGY

CWCTE strategy is based on the simple idea that the exchange of information and expertise among professional educators gives added value to their own activities in terms of knowledge, efficiency, effectiveness and the growing dimensions of Teacher Education for development.

ACTIVITIES

CWCTE would unite Teacher Education Institutions across Common Wealth Countries in an effort to improve Teacher Education through research on education reform and policy. A series of cross national and thematic reviews would be developed to strengthen Teacher Education. An extensive annotated bibliography would be developed and made available. Partners would be encouraged to produce Teacher Education research plans. CWCTE would promote activities such as study visits and meetings of experts in order to stimulate the sharing of information and experiences. CWCTE would also organize international collaborative projects that could function as input for research and development in Teacher Education. The collaborative projects that are initiated by the members would be encouraged. In this way CWCTE would ensure the mobilization and circulation of high-level knowledge and information amongst its members.

WORKING OF THE CWCTE

The Annual General Meeting (AGM) under supervision of its elected president shall

decide on the strategic plan and the admission of members. The AGM would also elect the Board and make policy decisions.

The members would receive following benefits:

- Abstracts of researches undertaken in Teacher Education and brief information about the investigators.
- Data base of Innovations in Teacher Education.
- Information on the recent and leading researches, and trends in Teacher Education.
- Information on the Governmental policies, schemes and projects including appraisals-mid- term and final.
- Publications including proceedings of the meetings.

The Board under supervision of its elected chairman shall put forward the topics to be discussed and agreed by the AGM. It would implement resolutions and look after the interests of CWCTE during the periods in between the meetings of the AGM.

The Secretariat shall be responsible for the administrative and financial operations, publicity and organizational tasks. Furthermore, the secretariat would be responsible for:

- program coordination,
- promotion of communication and contacts among institutions,
- promotion of CWCTE as a knowledge network in relation to the member institutions, and
- support to the design of a long-term policy and annual plan of activities in Teacher Education.

CWCTE main PR and communication tool would be its website. The website would contain information on members (institutions and individuals) and collaborative programs & projects. CWCTE newsletter, would contain information about the developments in the member institutions, achievements and forthcoming activities.

Webliography: www.icorecase.org

Universal Happiness & Peace

Chhaya Goel
Retired Professor
Devraj Goel
Professor Emeritus

CASE- MSU- Vadodara- Gujarat-India

Wonderful are the beauties of nature. Despite diversity, each and every form of creation is manifestation of the one perfect complete evolving eternal whole (*Uni-verse*, that is, *towards One*). The entire Universe is manifestation of one and the abode of one. Universe & Happiness are Synonyms. Any deviation & deformity is self invited. Happy are those human beings, where, ideas spring, feelings flow, motor creates, spirit reins, and the self resonates with the universe & creator. We always look for universe, where, flower- essence- fragrance and the entire aura is one, Pipe- Piper- Piped- environ are one, JYOT- JYOTI- JYOTSNA, VYATH- VYATHA- VYATHIT are one, learners emulate their teachers to live & to die day & night, little birds fly together in the sky, magnanimous elephants dance together fully synchronized, lions roar together to secure their forest with full might. Happiness is a wholistic state of full immersion & contentment.

Crowing cocks, dancing peacocks, playing squirrels, chirping sparrows, jumping jackals, running rabbits, watching dogs, humming bees, tireless donkeys, playing monkeys, herds & shepherds, galloping horses, groups of deer, jugglers and beers, thrust full springs, melting glaciers, roaring falls, rushing rivers, lost learners, dedicated teachers, perfect doctors, sun & planets, moons & stars, table & guitars, rains, rays and rainbows, every entity & phenomenon are the manifestations of the creator.

There are many a diversities of the universe- five star hotels amongst huts & slums, floods & droughts, tall-men & dwarfs, gardens & deserts, capitalists & beggars, articulates & autists, saints & scoundrels, predators & preys, extroverts & introverts, hills & valleys, jets & carts, peace & chaos, palaces & footpaths, laughter & tears, fear & cheers, clad & naked, and infinite more. The emerging question is how to verse with peace & happiness!

Parameters of Happiness

Is happiness measurable? Is it scalable? Are physically fully healthy people happy? May or may not be. Are mentally healthy people happy? May or may not be. Are economically well to do happy? May or may not be. Are spiritually deep people happy? May or may not be.

Status of Health in India

Healthy nations require healthy beings. Fully healthy beings in the 21st Century is a figment of imagination. There are evident physical & mental disorders. There is degeneration of environment. The ultra modern society has regressed into many imbalances. There is an alarming number of underweight children in India. Fast food is resulting into daily diseases. Sparrows & Honey Bees are disappearing. Forests of Multi-Storey Buildings are in the fore range. Rivers are polluted. Water is polluted. Air is polluted. Soil is polluted. The health issues are countless. Starting from pre-natal health, across the country very few women are healthy during the pregnancy period, physically and mentally. It affects the off-springs adversely. The status of soil in which the seeds are sown, the irrigation water, the fertilizers, the atmospheric air, all have degenerated. The food stuff available in the market is largely contaminated. The green washed vegetables and fruits are readily available in every season.

The drastic change in eating habits, especially of the teenagers and youth, is another alarming issue. The most liked food of the present generation is constituted of Pizzas, Pastas, Burgers,

Frankie, Hot Dogs, artificial Chinese food & foreign food. The use of fibers in the preparations of packed fast food causes lot of digestive problems. We have largely forgotten the Indian Cultural Heritage. Our tastes have changed as per the tastes of the producers. A sizable number of Indians are vitamin D and B12 deficient. Most of the cold drinks are highly opaque. We do not know what we are taking in. There is over dose of preservatives.

Many a people have psycho-neurosis, obsessive neurosis, insomnia, depression, hypertension, aggression, stress & strain. Artery blockage, Diabetes & Tuberculosis are very frequent. There is alarming fall in the heart & brain entrainment ratio. The life styles have changed. The digital age is suffering from many health hazards. The loss of eye power at an early age is more due the use of electronic gadgets than any other cause.

The modern kitchens seem to be beautiful in face, but, create many health problems. The use of microwaves, non-stick cook-wares and electronic appliances rather than necessity has become a fashion & prestige symbol. Over use of microwaves results in removal of nutritive ingredients of the food.

The reversal of the proverb 'Health is Wealth' --- 'Wealth is Health' seems to be the major contributor towards all kinds of health issues. For revival of health, we should go back to our old politeness and ancient culture, namely, simple living & high thinking, with naturalism, naturopathy & full Yoga.

Human Development Index

The **Human Development Index (HDI)** is a composite statistics of life expectancy, education, and income indices.

Published on 4 November 2010 (and updated on 10 June 2011), starting with the 2011 Human Development Report the HDI combines three dimensions:

- A long and healthy life: Life expectancy at birth
- Education index: Mean years of schooling and Expected years of schooling
- A decent standard of living: GNI per capita

In its 2010 Human Development Report, the UNDP began using a new method of calculating the HDI. The following three indices are used:

$$1. \text{ Life Expectancy Index (LEI)} = \frac{\text{LE} - 20}{82.3 - 20}$$

$$2. \text{ Education Index (EI)} = \frac{\sqrt{\text{MYSI} \cdot \text{EYSI}}}{0.951}$$

$$2.1 \text{ Mean Years of Schooling Index (MYSI)} = \frac{\text{MYS}}{13.2}$$

$$2.2 \text{ Expected Years of Schooling Index (EYSI)} = \frac{\text{EYS}}{20.6}$$

$$3. \text{ Income Index (II)} = \frac{\ln(\text{GNIpc}) - \ln(100)}{\ln(107,721) - \ln(100)}$$

Finally, the HDI is the geometric mean of the previous three normalized indices:

$$\text{HDI} = \sqrt[3]{\text{LEI} \cdot \text{EI} \cdot \text{II}}$$

LE: Life expectancy at birth

MYS: Mean years of schooling (Years that a 25-year-old person or older has spent in schools)

EYS: Expected years of schooling (Years that a 5-year-old child will spend with his education in his whole life)

GNIpc: Gross national income at purchasing power parity per capita

Gross Happiness Index

All the entities in this universe are interrelated and interdependent. Gross Happiness presumes wholistic universal development. Wholistic Universal Development demands each & every entity to be in healthy state & configuration having healthy congregation & constellation. Universal health, that is, health of all the constituents of the universe, that is, human beings, planets, stars, atmosphere, plants, animals and all is interrelated & interdependent. Society can be called Society where every individual self resonates with the environment generating a realm of truthfulness, compassion and forbearance emerging into Satyam Shivam Sundram. In this realm there is no space for arrogance which is felt as antithesis of etiquettes & humility. Gross Development demands equity of investment and income. There is immense central tendency irrespective of variability. Every one is respectful & respected. There is decency, discipline and decorum in every domain of universe. There is democracy in ruth, rather than, mechanistically flowing with the count of heads. Every raise of hand & rise of head is truly feeling & expressing. Margins integrate into the full. Where we like to possess only as much as is required to sustain happy & healthy resonating life. Where renunciation over powers passions, possessions and obsessions, where return on investment is measured in terms of sphere welfare, where Human Development Index is the prime index of development in the ocean of Gross Domestic Product (GDP), there resides the beauty of universe. There is a need to workout Universe Development Index inclusive of Globe Development Index. Is it within the purview of human beings? Let us search & research. The emerging courses of human ecology & sustainable development tend to realize the vision of Swami Vivekananda.

Gross Happiness Index could be a geometric mean of Full Life of every entity, living & non-living, Gross national income at purchasing power parity per capita, & its judicious investment. Such mathematical computations demand infinite capacity & capabilities.

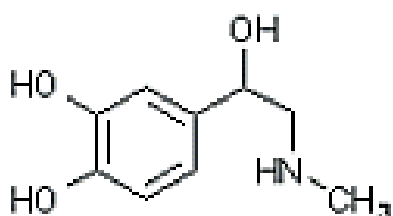
Bipolarity Intelligibility

The universe is essentially bipolar in nature. Bipolarity is the basis for the sustainable development of the universe. This bipolarity needs to be properly conceived. Bipolarity is essentially the basis for genesis, creation & recreation of life & living, designing & sustainable development. It is not difficult to research the misperceptions of the beauties of nature. Beauties of nature need to be respected & appreciated. But, our obsessions for possession are destroying the beauties & bounties of the nature. Could we realize detached love for the nature through unconditional love for all the entities? Instead we have started treating the nature as a resource rather than adoring her as source. Resource is endowed by the nature. Usage of resource has been presumed to be the prerogative of man. Man likes to be treated as a source than resource.

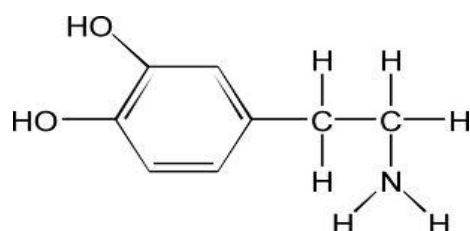
Heart Brain Entrainment

Health & happiness depend upon the dopamine adrenaline balance. Dopamine is the primary activator of the heart. Dopamine levels in the heart determine the vigor of the neural signals to the brain. Dopamine levels in the heart are determined by the amount of joy and the amount of resonance that the heart is feeling. The sheer joy of being alive is the energy that allows the heart to resonate and initiate the primary dopamine release for the heart. Dopamine does not cause joy. Joy causes the release of dopamine. The greater the joy, the greater the level of primary dopamine in the heart. Whether a person is happy or sad, he can always resonate with the sheer joy of being alive. Whether a person is in the midst of battle or in solitude, the sheer joy of living can be present behind his fear or his tranquility. Joy and the heart's ability to resonate are very nearly the same. The former is more purely energetic, the other is the more physical manifestation of the joy energy. The core level of dopamine prepares a person, in body and brain, to be a feeling, sentient being.

Structures of Adrenaline & Dopamine



Adrenaline



Dopamine

Influence of Surroundings & Thought

Experiment on Water Crystals

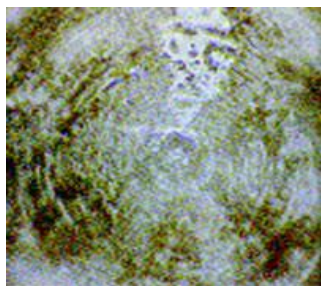
Water crystal experiment conducted by Dr. Masaru Emoto in Japan

It is a direct manifestation of how people's minds influence matter.

a. Water Crystal Exposed to the Song Entitled, "Silent Night"



b. Water Crystal Exposed to Heavy Metal Music



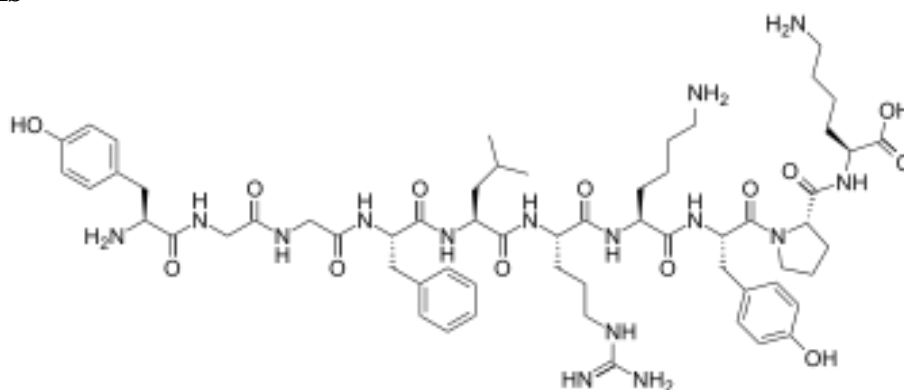
This experiment proves that water is influenced by its surroundings and ambience it is in. Human body is 80% water. Then how much do we affect and are being affected by the environment. Truthfulness, Compassion and Tolerance have been found to have profound effect on all of us, wholistically.

People who practice yoga gain a peaceful and tranquil self reaching healthy & blissful state. It is evident through a review study. Data were collected by review of Falun Dafa books, Journals of Falun Dafa, Scientific Journals, Scientific Conferences, related Dissertations, internet materials, and also from interview by practitioners of Falun Dafa.

c. Beauty of Laughter

Beauty is not looks alone – it is holistic as it encompasses both physical and mental attributes. Enhancing this wholeness of self is laughter - an elixir for wellness. It helps to outwardly reflect the inner glow of good health, happiness and joy. The well being of people is largely dependent on fitness levels both physiologically and psychologically. The constant struggle to cope with enormous stressors in life takes its toll on one's appearance. Laughter reduces stress levels and stimulates the production of endorphins, natural opiates known for their relaxing effects. It also helps to release muscular tension and reduce the negative physical symptoms of stress, worry and anxiety. Laughter is a wonderful expression! When it comes from deep within it can help to release inner tensions. Laughter produces endorphins in the brain after responding to a rewarding activity according to modern neurophysiology! Laughter can be medicine for the soul!

Endorphins



Chemical structure of *alpha*-Neendorphin (α -Neendorphin)

Some Reflections on Peace

➤ Peace & Thinking Patterns

Mind has a tendency of wandering. Control on the mind demands inner control, not to be swayed away by any attraction or passion. Nothing can deviate a person with full inner control. We ought to be serene rather than turbulent, calm rather than stormy, expressive & booming rather than depressive & repressive, positive than negative, final & decisive rather than

recursive & lurking, neutral rather than polar, modern rather than primitive, cultured rather than ultramodern, socio- centric & ethnocentric rather than self centric & ego centric, sharp & decisive rather than blunt & obsessive, wholistic rather than patristic, optimistic rather than pessimistic, happy rather than sad, simple rather than complex, considerate rather than rigid, social rather than unsocial, independent rather than dependent, broad minded rather than conservative, determined & active rather than idealistic & passive, logical rather than irrational, factual & theoretical rather than propositional & hypothetical, creative rather than stereotyped, pioneer than conservative & copier, confident rather than diffident, relaxed rather than stressful, focused rather than deviant, flexible rather than rigid, open rather than closed, resonating rather than stagnant & isolated, constructive & connective rather than destructive & disruptive, innovative rather than customary, resolved rather than engrossed, peaceful rather than disturbed, free rather than confined, striving rather than starving, resolved rather than recursive, final rather than obsessed, normal rather than psychoneurotic, lucid than ambiguous, fruitful than futile, innocent rather than cunning, intuitive rather than peripheral. But how to realize such a state? Thinking regulators demand healthy neurons and their interconnections, mental control, spiritual control, control on the motor muscles, simple living & high thinking. Thinking is the cause of both, peace & chaos. Thinking is trainable.

➤ **Peace: Real & Evident**

Whatsoever is evident is not real, whereas, whatsoever is real is not evident. How to resolve the real & evident dichotomy to be in peace?

➤ **Peace: Cause- Effect & Reason**

Reason between cause and effect is rarely perfect. Reasoning is never ever ultimate. So the cause and effect gaps. It is a never ending quest in search of truth. How to reach the truth for the realization of peace?

➤ **Peace & symbiosis**

We ought to learn to live together. Rather than treating mother nature as a source we have started resourcing her. Rather than adoring nature, we have started exploiting her. Rather than being friendly with the nature we are becoming more & more hostile. We have moved away from naturalism to existentialism, from realism to idealism, from civilization to modernization. We have almost lost our cultural heritage & are becoming mad after modernization. Rather than being symbiotic we have become more and more alienated. Rather than being united we are becoming more & more fragmented. Rather than uniting into peaceful immersion we have shattered into chaos & fragmentation. The emerging question is how to revive peace?

➤ **Peace & Learning**

Peace is the prerequisite for learning. Unless we are noise free we cannot receive. Without receiving there is no assimilation, reflection and learning. While receiving any stimulus there should be no noise- internal or external. Hence, peaceful state is a must for learning & learning outcome.

➤ **Peace & Sacrifice**

Let us look at any entity in this universe and how much devotion, dedication and SMARPAN these have. Be it silken cotton of the Silent Doctor SEMAL, KHAS KHAS & Nectar of POPPY, GULKAND of Rose, Essence & Fragrance of CHAMPA & CHAMELI, Medicine of AMALTASH, NIMBOLI of NEEM, Turpentine Oil of PINE, plight of honey bees, glow of glow worms, functions of insects & beetles. Secret of the universe lies in interrelation, interdependence, SAMPARPAN & healthy coexistence.

➤ **Peace & Resilience**

Variability & Central Tendency or deviation & regression are the realities. It is always desirable that we realize resilience & normal state at the earliest. Sooner it is realized less damaging it is. This is an age of stress & strain. But the state of peace demands instant resilience. There are numerous pressures these days, such as, high blood pressure- low blood pressure, compulsive obsessive neurosis, depression & hypertension, which could be both self invited & environment offered. We ought to be strong enough not to deviate, if at all we deviate then there must be most efficient resilience.

➤ **Peace & giving & forgiving**

Even in prayers we should make it a habit to report our achievement & contribution, rather than seeking grace. Peace rests in giving and forgiving. Nature is the best teacher who teaches us what to give, when to give, and how to give. We should realize the strength of giving & power of forgiving.

➤ **Peace & unconditional love & affection**

Peace lies in unconditional love & affection for all. Unconditional love & affection demand thorough knowledge of all. Knowledge base of all demands continuous quest for reality- search & research. Cause & effect relationship demands thorough reasoning. Reasoning is always limited. Even then we can realize unconditional love & affection which peace demands. Re-as-on is a continuous, infinite, never ending chain. We ought to transcend time- space & reason to realize our quest for vision.

➤ **Peace & de-becoming**

Peace is a blissful journey through be, becoming, being & de-becoming. What we want to be? What are we becoming? What is our being? Even the highest level of knowledge base & wisdom reveal that our being howsoever rich & comprehensive is too wanting & limited. Functional feelings of our being help us identify & locate ourselves in this indeterminate & little known cosmos.

➤ **Peace & Justice**

Peace demands truthfulness, compassion, forbearance, forgiveness, equity & equality. India is a sovereign, socialist, secular, & democratic republic. Indian constitution observes justice for all. No one has the right to be partial & unjust, irrespective of who we are, politicians or public, capitalists or below poverty line, doctors or patients, secretaries or open. No gap is permissible between democratic & republic, male & female, high & low.

➤ **Peace & Bipolarity**

Bipolarity is the open secret of the creation & sustenance of the universe. We need to understand the bipolar & their co-existence, such as, male & female, high & low, positive & negative, peace & chaos, hill & valley, heat & cold, fire & ice, desire & peace, rich & poor, dare & fear, azad & prisoner, predator & prey, aggression & depression, repression & expression, laughter & cry, thief & spy, earth & sky, desert & crowd, hope & despair, use & abuse, APRADHI & FARIYADI, GULAMI & AZADI, Devaluation & Neo-valuation, Saints &

Scoundrels, Philanthropists & Dacoits, Producers & Takers, SMARPAN & DARPAN, Sordid Drama & Silent Spectators!

➤ **Peace & Happiness**

We do not have sensitivity towards HDI, that is, Human Development Index what to talk of Universe Development Index. Human greed of manipulation, possession & hoarding has converted human beings from sources to resources. Return on investment should find expression in the form of peace & happiness.

➤ **Peace & Laughter**

Laughter sustains & strengthens life by realizing peace. The two main chemicals that are used in when we laugh are Endorphins & Dopamine. Endorphins the natural happy drugs are released from the pituitary glands into the blood, then into the brain & spine. Also Dopamine chemical is released in the brain and then are sent as signals to the other nerves of the body.

➤ **Peace & Tears**

Shedding off the tears, sharing the sad state also relieves us of disease & discomfort & helps in realizing peace. We have basal tears, reflex tears & emotional tears. The cornea is continually kept wet and nourished by basal tears. Tear fluid contains water, mucin, lipids, lysozyme, lactoferrin, lipocalin, lacritin, immunoglobulin, glucose, urea, sodium and potassium. Lysozyme fights against bacterial infection. Reflex tears are released during irritation to the eyes say while cutting onion or pepper spray. Negative or positive emotions cause psychic tears. Emotional tears have more of protein based hormones.

➤ **Peace & Play**

Arriving in the optimum state of energy keeps us calm & cool. Playing any game – Hockey, Cricket, Football, Bad Minton, Table Tennis, Lawn Tennis keeps us happy & gay. Athletics such as, Jump & race, Disc Throw, Javelin Throw keeps us fit. Climbing up hill & coming down hill helps us sustain momentum. Peace & Play are perfectly interrelated.

➤ **Peace & Yoga**

Peace begins when everything else ceases to be. Peace is complete yoga at the functional level. Yoga is that ultimate state of bliss when we are integrated unit self. Peace demands Gyan Yoga, Bhakti Yoga, Karma Yoga and Raj Yoga. Peace is by realizing which we can DARSHAN entire COSMOS. Yoga is the pre-requisite for peace.

➤ **Peace & Health**

Peace & Health are intimately related. Many a health issues, both, physical & mental are on the fore. How to observe sound health? Health, Happiness & Peace ought to be fully observed.

Education Happiness & Peace

Education is a discipline which deals in the development of universal beings, wherein, there is interrelation, interdependence and healthy constellation amongst all the entities of the universe. Education essentially deals in information, that is, the cause & effect relationship amongst variables. Educationists find out, reason out and try to establish the various causes & effects

relationships. But this reasoning is never ever perfect. We recursively reason, that is, re-as-on or revisit our knowledge, skills & feelings. So, we enter into the realm of research which is endless quest for reality. The research is rarely ultimate. But education goes on with this passion. Peace is a state of full immersion, when a researcher is fully lost in quest, an artist is fully engrossed in creation, a constructivist is fully into germination, incubation, innovation, creation, construction and connection, an administrator is fully into organization & management, a teacher is fully into learners, a politician is fully into public, a farmer is fully into seeds, crops & conditions. Peace is a state of satisfaction and contentment. Peace is free of internal & external noise. Happiness is a state when the objectives, what so ever set, are realized. Happiness & Peace are the core of Education. Education for the heck of mere knowledge base, be it, elementary, secondary or higher, liberal or professional is no use. The state which is not in peace cannot be called a state. Happiness & peace ought to be the prime concerns of Education.

Concluding Remarks

Day & night we are in quest of happiness & peace. Round the clock we are in search of self. But do we ever realize self? When we have full immersion we are in peace. When we are fully lost we are in peace. When we are fully awake we are in peace. When we are fully conscious we are in peace. When cause & effect reasoning tends to be perfect we tend to be in peace. When we do not think we are in peace. When we are composed we are in peace. All the germinations, all the incubations, all the innovations, all the creations, all the connections emerge from peace. All the algorithms, all the programs, all the executions emerge from peace. Heart & brain entrainment is in peace. Motor muscle momentum resonance is in peace. The blossom, bloom & fragrance reveal peace. The culmination of chaos is always in peace. The universe itself is the manifestation of peace!

Happiness is a state where ideas spring, feelings flow, motor creates, spirit controls & the self resonates with all in full swing. Education as a faculty is expected to deal in full, meaningful, healthy, happy & peaceful life.

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Educational Technology in India

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Introduction

The 21st century demands techno-pedagogues who are techno-savvy, content masters and fully situated on the principles of teaching. Technology is the application of sciences artistically in a systemic way. Technology is evidently omnipresent reaching & deploying the most recent immediately. Technology is available in various forms. There is an evident shift from scattered media to multimedia, dot to globe and point to morphology. Technology is our extension in many varied forms. Radio is extension of our voice; television is extension of our view composition & expression, motorbikes are extensions of our feet, clothes are extension of our skin, computers are extension of our brain, whereas, multimedia are our wholistic extension. There are many a forms of Educational Technology, such as, Educational Radio, Educational TV, Educational Satellites, Computer Aided & Integrated Education, Web Based Instruction and Social Networking in Education. We have HIFI & WIFI, that is, High Fidelity & Wireless Fidelity Technologies. There are point to point networks and broadcast networks. There are LAN, WAN and www. There are Polar Satellites and Geo-stationary Satellites. There is an evolution from desktops to laptops to tablets. There is a move from technology aided instruction to technology integrated education. Technology is available in both synchronous & asynchronous modes. Progressively there is a move from F2F mode to distance mode through Open Education Resources (OERs) and Massive Open Online Courses (MOOCs).

Key words: MOOCs, OERs, educational radio, educational TV, educational satellites, computer aided and integrated education, web based instruction, social networking, Educational Technology

Omnipresent Technology

It is an age of Technology. Essence of technology is all around us. Technology is here, there and everywhere. It can lower the unit per capita cost of communication; and by and large seems to be driving force. In the area of staff development, technology can provide quality training at a faster speed, at a cheaper rate, at chosen places, at convenient times and for larger masses, with untiring repetitions, and iterations. But we have to be cautious. One cannot use any medium anywhere. Inappropriate use of media can have a backlash effect. One must know the media thoroughly before using. The unreached, the isolated and those who have been ignored for too long must be attended to on a priority basis. We should therefore choose pro-poor technologies. Here the poverty is seen as knowledge poverty.

Nature Friendly Technology

Technology should be designed as nature friendly. There are two discrete ways of seeing things through the eyes of an artist and through the eyes of a technologist. In fact technology is integration of both. Environment can be perceived both as a source & resource. There are people in the universe who see nature as a supply of resources, but there are also those who see the world as one lively beautiful life force. But it is not fair to dichotomize the traditional values and media values as- Honesty and shrewdness, Loyalty to others and lookout for

home/family and alternate life style, absolute norms and situational ethics, work hard ethics and I deserve a living, compassion and cruelty, peace and violence, inoffensive speech and vulgarity, conformity and rebellion, personal responsibility and blame anyone and everyone, politeness and insults.

Techno-positivism

We believe in Techno-positivism in all walks of life- health and hygiene, family care and human development, food and nutrition, housekeeping, dress designing, conservation and development of environment, cultural heritage and social fabric, social work, economics, education, management, administration, polity, fine arts and communication. Educational technology has to cut across various sections and levels of society. Technology can cut across all age levels, infant, child, youth, adult and old. Technology can provide inputs for all levels of education and all strata of the society including house maids, labourers, migrating groups, hawkers, and support staff. Negative thinking for misuse of the strengths of technology should be avoided. Nature and Technology, Man and Machine should supplement each other. No attempts should be made to originate theories of negativity against techno-positivism.

Media in Education

Medium is carrier of message. In this age of electronics & communication there should be added focus on media compatibility and creditability. The messages need to be distributed across various media judiciously. It has been observed that the different media are being used in education casually. Rarely attempts are made to examine message media compatibility. Why should the relevance and quality of a message communicated through electronic media be questionable? Technology and pedagogy seem to function in isolation. There are rare bonds in the form of techno-pedagogy. At times media seem to be more mechanistic than naturalistic. The educational media scripting is significantly wanting. The production variables need to be treated very scientifically. In this age of knowledge explosion and media implosion media literacy should be a must for.

There is a shift from Indian pen to the computer key board, from black board presentation to power point presentation, from paper pen test to computer based test, from interpersonal instruction to mediated instruction, from teacher dependent learning to independent learning. It is a matter of great concern that though we have a media crowd but without media culture. Media are extension to man. But the question is how to realize this extension truly. We have country wide educational radio and educational T.V programmes at various levels of education. But the programmes are either underutilized or not utilized. To what such a state should be attributed? Are the needs of the learners not ascertained prior to designing and production? Are the production variables not duly considered? Are proper feedback mechanisms lacking? Is there a need to enhance the quality and relevance of the mediated programmes? We have not been in a position to develop skills and competencies to deal with the modern media.

There are more powerful learning paradigms available now. There is a shift from linear to hypermedia learning, from instruction to construction and connection, from teacher centred to learner centred education, from absorbing material to learning how to navigate and learn, from school to lifelong learning, from all fit in one to customized learning, from learning as a torture to learning as fun and from the teacher as transmitter to teacher as facilitator.

ICT in Education

Information and Communication Technology (ICT) has become, within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding of ICT and mastering the basic skills as part of the core of education, alongside reading, writing and numeracy. The recent effort of the Government of India (GOI) seeks to deepen the use of ICT in almost every sphere of life. The Digital India Campaign (2015) of GOI strives to transform India into a digitally empowered society and knowledge economy by focusing on the three vision areas **i.** Digital Infrastructure as core utility to every citizen, **ii.** Governance and Services on Demand and **iii.** Digital literacy and empowerment of citizens. The three cardinal principles of education policy viz., access, equity and quality could be served well by harnessing the huge potential of ICT. Anytime anywhere mode of delivering quality education using ICT is one such implication

of technology in education. To motivate teachers to use ICT extensively, many incentives have been instituted by the Government of India. One such incentive for the school teachers is national ICT Award for School Teachers.

Realizing the importance of media and educational technology in India, the national policy on education in its modified document -1992 states that, "Modern communication technologies have the potential to bypass several stages and sequences in the process of development encountered in earlier decades. Both the constraints of time and distance at once become manageable. In order to avoid structural dualism, modern educational technology must reach out to the most distant areas and deprived sections of beneficiaries simultaneously with area of comparative affluence and ready availability". Further it has stated that "Educational Technology will be employed in the spread of useful information, the training and retraining of teachers, to improve quality education, sharpen awareness of art and culture, inculcate abiding values, etc., both in the formal and non-formal sectors. Maximum use will be made of the available infrastructure".

The National Curriculum Frame work (NCF) – 2005 also states "Judicious use of technology (Multimedia and ICT) can increase the reach of educational programmes, facilitate management of the system, as well as help address specific learning needs as requirements of young learners, teacher training, facilitate classroom learning, and be used for advocacy. Possibilities of teaching and learning at varied paces, self-learning, dual modes of study could all benefit from the use of technology, particularly ICT. The increasing use of the internet has enabled the sharing of information and provided space for debate and dialogue on diverse issues hitherto unavailable on such a scale. Technological innovations are also necessary for appropriate equipment and aids for meeting the learning requirements of children with special needs. What needs to be underscored is that technology could be integrated with the larger with larger goals and processes of educational programmes rather than viewed in isolation or as add-on. In this context, technological use that turns teachers and children into mere consumers and technology operators needs to be reviewed and discouraged. Interaction and intimacy are the keys to quality education, and this cannot be compromised as a principle in any curricular intervention". In a sense the NCF-2005 emphasises a paradigm shift in respect of the entire process of education. NCF calls for a shift to learner centric ways (primacy of active learner), provide scope for variations in learners needs, multiplicity of learners exposures, and creation of citizens capable of reflective thinking and empowered participation in development.

MHRD Government of India's Initiatives in Spread of ET and ICT in Education

India recognized the importance of ICT in education as early as 1970, when the use of educational TV came into existence, it got further strengthened in 1984- 85 when the computer literacy and studies in schools (CLASS) project was initially introduced as a pilot with the introduced as a pilot with the introduction of BBC micro-computers. A total of 12,000 such computers were received and distributed to secondary and senior secondary schools through state governments. The project was subsequently adopted as a centrally sponsored scheme during the 8th five year plan, the scheme was widened to provide financial grants to institutions, which were given BBC Micros, and also covered new government aided secondary and senior secondary schools. Assistance included annual maintenance grant for BBC micros and purchase, as well as, maintenance of equipment for new schools.

About 2598 schools having BBC micros were covered under the CLASS scheme during the 8th plan for providing instructors, maintenance of hardware, consumables and text books for students and training of teachers in schools. In addition, 2371 schools were covered with new hardware and services, which included Rs. 1.00 lakh for hardware configuration and Rs. 1.30 lakhs per annum for recurring costs Rs. 0.80 lakh per annum was kept as the recurring costs for schools, which has already been covered under the BBC micros scheme.

NIC was identified as the nodal agency for finalizing the contract for the supply of hardware. The use and supply of software was limited, coverage was confined to senior secondary schools and the students of class XI & XII had to undergo a computer course module.

National task force on information technology and software development (IT task force) – constitute by the Honourable Prime Minister of India – in July, 1998 has made specific recommendations on introduction of IT in the education sector including schools. The relevant paragraphs are reproduced below: VIDYARTHI Computer Scheme, SHIKSHAK Computer

Scheme and School Computer Scheme to enable students, teachers or schools respectively, desirous of buying computers to do so under attractive financial packages. These schemes will be supported by a suite of initiatives such as lowering the cost of PCs, easy instalment bank loans, computers by NRI organizations, large-volume bargain price imports, and multi-lateral funding. Computers and Internet were expected to be made accessible to schools, polytechnics, colleges and public hospitals in the country by the year 2003. The concept of SMART schools where the emphasis is not only on information technology in schools, but also on the use of skills and values that will be important in the next millennium, shall be started on a pilot demonstrative basis in each state. The report recommended provision of computer systems to all educational institutions up to secondary/ higher secondary schools by suitable investments (about 1-3%) of the total budget during the next five years. The recommendations of the task force have been approved by the council of ministers.

The 'ICT@schools' scheme is a window of opportunity to the learners in the schools of India to bridge this digital divide. The scheme is not a simple merger of the earlier CLASS (1984-85) and ET schemes (1972: under which Radio – cum – cassette players (RCCPs) and colour television sets (CTVs) were supplied in schools) but is comprehensive and well thought out initiative to open new vistas of learning and to provide a level playing field to school students, whether in rural areas or in the metropolitan cities. The 'ICT@schools' scheme is not a standalone scheme, but actively solicits the partnership of states, union territories & other organizations in a mutual endeavour to bridge the heterogeneous proliferation of ICT across different socio-economic and geographic segments in the country. This partnership is manifest in the structure of financing the initiative, in encouraging the development of long term computer education plans, the setting up of smart schools in KVS/NVS and in states as technology demonstrates and in providing for supplementing the States efforts in these areas with no attempt being made to supplant the state schemes.

In smart schools, the emphasis would not only be on the use of information technology but also on the use of skills and values that will be important in the next millennium. It is hoped that at least one section (of 40 students) in each of the classes IX-XII will be fully computerized. Thus a school having 160 computers @ 40 computers for each IX to XII classes may be called a smart school under the scheme. However, keeping in view the fact that this target cannot be achieved in one go, it is proposed to provide 40 computers to such identified schools.

The centrally sponsored scheme of 'Educational Technology' (1972) and 'computer literacy and studies in schools' (1984-85) have been suitably modified keeping in view the past experience, the feedback which has been received and changing needs to form the new scheme of 'Information and Communication Technology in schools'. The component regarding financial assistance to state/UT's for purchase of Radio-cum-cassette players (RCCPs) and colour television sets (CTVs) under the erstwhile educational technology scheme has been weeded out.

ICT @ Schools Scheme Launched by Govt. of India

The centrally sponsored scheme "information and communication technology (ICT) in schools" was launched in December 2004, to provide opportunities to secondary stage students to develop ICT skills and also for ICT aided learning process. The scheme is a major catalyst to bridge the digital divide amongst students of various socio-economic and other geographical barriers. This provides support to States/UTs to establish computer labs on a sustainable basis. It also aims to set up SMART schools in Kendriya Vidyalayas, Navodaya Vidyalayas and schools run by states/UTs to act as "Technology Demonstrates" and to lead in propagating ICT skills among students of neighbourhood schools.

Educational Technology: Research Scenario

A sizable number of studies on effectiveness of CAI developed through various computer languages employing either pre-experimental design or quasi experimental design revealed significant mean score gain from pre-test to post-test. Studies on the effectiveness of CAI reveal favorable reactions of students and teachers towards the CAI. (Prabhakar 1989; Himani 1990, Mahapatra 1991, and Adhikari 1992, DAVV, Indore; Khiwadkar 1999, Zyoud 1999, Yadav 2000,

Goel Khirwadkar Tomar Das & Joshi, 2000, Macwana 2004, Sharma 2005, Barot 2005, Pradesi 2005, and Rathod 2005, MSU; Suwanna 2004, SGU; Upadhyaya 1999, MJP Rohilkhand University, Bareilly; Sanjana 2001, MDU and Pandian 2004, DU).

There have been found rare studies on the pedagogic/techno-pedagogic analysis of the computer based educational instructional programs. These studies reveal that there should be added focus on production variables, pedagogic principles and spatial and temporal contiguity of various message forms (Patel, 2001, MSU; Chaudhari, 2005, MSU).

Computer as a medium has been found to have the potency of addressing the heterogeneity in terms of variables, namely, IQ, Interest, Motivation, Language level (Zyoud, 1999, MSU).

There are rare studies on effectiveness of CALM in various modes, namely, text, graphics, text & graphics, text, graphics & music. It has been found that the composite modes may not always ensure higher level of language learning (Das, 1998, MSU).

Very few studies have been conducted on the relative effectiveness of CAI with peer interaction in mono, dyad and triad (Pardesi, 2005, MSU).

Attempts have been made for designing, developing and implementing computer based Learning Resources Management System (LRMS). The automated LRMS has been found definitely more effective than the manual LRMS (Beryah, 1995, DAVV).

A few studies have been conducted on the relative predictivity of various variables with respect to the criterion variable, namely, Educational Proficiency (Mishra, 1993, DAVV; Goel, 2003, MSU).

A study conducted on Time Space Personnel Management System revealed that the computer based TSPM system was found relatively more acceptable and better functional than the manual TSPMS (Biswal, 1995, DAVV).

Though studies have been conducted on the automation of examination system, yet these studies find rare expression at the functional level. Teacher Education Institutions need to promote Choice Based Credit System and on demand examination (Mahajan, 1993, DAVV; Joseph, 1993, DAVV; Shinde, 1993, DAVV; Goel, 1997, MSU).

A sizeable number of teacher education institutions in India have initiated into ICT in Education either as a core course or as optional course. In spite of the impeding factors, namely, limited staff, inadequate laboratories with maintenance problems, sizeable classes, the courses have been found to realize their objectives reasonably (Goel, Das, and Shelat, 2003, MSU).

A sizeable number of teacher education institutions have been found lacking facilities, such as, Internet, MS Publisher, Acrobat Reader Goel, 2005, MSU).

A few studies conducted on the use of Internet in Teacher Education Institutions revealed that the student teachers largely lack in info-savvy skills and techno-pedagogic skills (Joshi, 1999, MSU; Dhodi, 2005, MSU).

Some of the teacher trainees make use of Internet for surfing, e-mail, research, core courses, special areas. But, the Internet is rarely used for web designing, reflective dialogue and outsourcing. Measures of Internet safety are rarely employed. There is a need to develop Net-Savvy Skills in Teacher Educator Trainees (Goel, 2006, MSU). Some Studies have been conducted on bridging the gaps between teaching styles and learning styles. The studies are appreciable but there is a need to conduct many more studies (Rathod, 2005, MSU).

Studies conducted on language instruction through Power Point Presentations on realizing communicative and functional languages have been found to go a great way in establishing the effectiveness of learning various languages (Yadav, 2005, MSU; Rathod, 2005, MSU). There have been rare studies on developing language learning strategies and learner autonomy through weblogs. Blogs not only provide teachers with an exciting new way to approach communicative language learning, these also give students a new reason to enjoy reading and writing.

Nayana Dhodi (2011) demonstrated very well how the info-savvy skills of Asking, Accessing, Analyzing, Applying and Assessing were developed in the Pre-Service Teachers of India through surfing on Cultural Heritage of India and Buddhist Heritage of India and the domains of their respective discipline methods. It is a joyful experience to travel through her doctoral Thesis experiencing various surfing skills, namely, skimming, scanning, authenticating, hyperlinking, switching, skipping culminating into educational immersion for seeking solutions.

Ali Haider (2016) conducted a study of **the Effect of Logical Thinking Ability and Computer Based Instruction Using Active Learning Techniques on Students' Achievement of Basic Concepts in Organic Reaction Mechanism**. The treatment was found to be effective, but, Despite appreciation for the package, there was a demand of teachers' involvement for regular chemistry instruction.

Anu Singh (2015) conducted a study - *Science Teachers 'Current Pedagogies, Their Context and Their Pedagogical Experiences with an ICT Intervention*.

Mohd. Mamur Ali (2017) conducted a study on **Identifying Problems in Students' Understanding of Linear Equations and Transcending Them With the Use of Computers**. The National Library of Virtual Manipulative (NLVM) Software could enhance the understanding of equality operator, arithmetic operators, variables & structure of equation. The computer could transcend the learners to have thorough understanding of linear equations bidirectional.

Rakshak Jain (2016) conducted a study- **Impact of Developed E-Content, Media and Study Habits on Perception Towards E-Content Based Learning Amongst Undergraduate Students**. The study has definitely contributed to the knowledge base in the realm of Electronic Media and e-learning system.

Educational Technology and ICT in Education have demonstrated their values. But, Technology in Education is not yet fully integrated. Technology in Education is still underutilized. There is a need to evolve & interweave the Techno-Pedagogic principles as follows:

Pedagogic Principles

The entire education ought to have scientific bases. Every educational input has to be based on scientific principles. There are various principles of teaching. While teaching every teacher should move from:

1. Concrete to abstract
2. Simple to complex
3. Easy to difficult
4. Whole to parts
5. Induction to deduction
6. Progressive differentiation to integrative reconciliation
7. Impersonal to personal
8. Differentiated to differential

9. Building blocks to structure
10. Learning Styles to Teaching Styles

Basic Model of Communication

Every teacher while teaching should employ Lass well's basic model of communication as follows:

Who – Sender analysis
Says what- Message analysis
To whom- Audience analysis
Through which channel- Medium analysis
With what effect- Communication analysis

Features of Communication

1. We cannot not communicate
2. Communication is irreversible
3. Communication is circular
4. Communication is helical
5. Communication is endless

The basic organisational principle flowing through this model of communication is that any communication is a function of the correspondence amongst sender, message, medium and the receiver.

Principles of Techno-pedagogy

There are numerous principles of Techno-pedagogy such as follows:

1. Medium is Message
The message should be Mediagenic. There should be medium & message compatibility. In no case medium should try to dictate the message. Medium should be neutral to carry or pass the message. Every message does not go with every medium. The messages should be judiciously distributed against various media
2. Spatial & Temporal Contiguity of Various Message Forms
Various message forms should be in the geographic proximity. Visual & its corresponding audio, picture & its commentary should run together. There should not be temporal or spatial gaps. More is the contiguity of various message forms, better is the reach.
3. Media Language Proficiency
Every medium has its own language. Radio has its own language, TV has its own language, and Computer has its own language. We the teachers, scripiter, presenters, ought to have media language proficiency, it terms of size of the message, intonation, modulation, lip-sync, pitch & volume and the speed of delivery.
4. Message Credibility & Media Fidelity
We ought to establish the testimony of the message- text and or visual prior to it is mediated. It should be factual, that is, flawless. There should be no message dilution, distortion or loss when it is mediated. Media should have very high fidelity. These days we have WiFi & HiFi, that is, Wireless Fidelity & High Fidelity. Any medium should cross validate any message before it is carried & delivered.
5. Balanced View Composition
The entire view composition needs to be configured very carefully. The relative position

of various subjects & objects, their relative colours, hue, saturation, reflection, background, foreground matter a lot. The view composition has to be plot compatible.

6. Message Irreversibility

Communication is irreversible. E-messages travel with the speed of light, that is, 3×10^{10} cm/sec which is seven times the circumference of the earth. We need to exercise psychomotor control. The testimony of the message needs to be fully established before we touch 'SEND'. A soft touch sends a message far & wide destined. To rectify an erratic message post-communication is a figment of imagination.

7. Projection Time Determination

Screen time of a message varies from culture to culture. Some are fast viewers, whereas, others are slow viewers. The on screen time needs to be decided very judiciously.

8. Correspondence amongst Sender, Message, Medium & Receiver

Any communication is a function of the correspondence amongst sender, message, medium and receiver. There is a need to do thorough analysis of the sender, message, medium & receiver. All these should be perfectly matching. The message should be mediagenic, as well as, receivergenic. There is a need to do thorough content analysis, medium analysis, as well as, viewer analysis, so that all of these are in tune.

9. Wave Lengths of Scriptor, Presenter, Producer & Cameramen

All the stake holders of designing & production should be at the same wave length. There has to be perfect interrelation, interdependence and understanding amongst all the elements Electronic Media. It has to be a perfect systemic approach. The entire View Composition, Camera density & Presenter Profile, Zoom Out & Zoom In, Background & Foreground, the content & modulation, the Receiver & Speed of delivery have to be in tune.

10. Quality, Demand & Supply of the Digital Products

The quality of the digital products ought to be established very carefully, right from germination through incubation, creation, construction & connection. Any digital product demands fully scientific bases, which need to be observed very analytically.

11. Natural Production

Voices should be directly recorded from the field be it, Rain Falls, Rivers, Birds, Thunders or VOX POLO, that is, own voices of the People, and onomatopoeia, that is, action sounding words. We should try to reproduce the reality as it is to the extent possible. Real is real & artificial is artificial. Let us try to be natural, if not, and then tend to be natural. Let us recreate the real, the original, the natural.

12. Compatible Format

The format of the program should be reality compatible. We need to decide the most compatible format amicably, such as, talk, documentary, drama, Feature, Narration, Experimentation very carefully.

13. Innovative & Interesting

Techno-pedagogy is expected to be innovative & interesting. Everyone likes to meet the Pioneers. It demands constructivist & connectionist approaches. Germination, incubation, creation, construction & connection are the salient phases of Innovative & Interesting Techno-pedagogy. Research & Renew, Explore & Expose, Innovate & Create.

14. Differentiated & Differential

The strength of Techno-Pedagogy lies in becoming differentiated differential. It should be in a position to serve all as per their tastes. Technology demands variety.

15. Wholistic Techno-pedagogy

Techno-Pedagogy is where ideas spring, feelings flow, motor creates, the soul reigns & the self resonates with the environment.

16. Communicative Techno-pedagogy

We cannot not communicate. At the same time communication is circular & irreversible. Techno-pedagogy should strictly observe the principles of communication.

17. Healthy Techno-pedagogy

Techno-pedagogy should be healthy. For that even the most quality Technology-Pedagogy-Content trio demands proper management & maintenance. There should be compatible management- centralisation, de-centralisation, delegation and devolution. There should be proper maintenance, such as, preventive, corrective, adaptive and perfective.

18. Symbiotic & Cybernetic

Content, Pedagogy & Technology should have symbiotic relationship. All these should learn to live together. Content Masters may not be pedagogues and vice-versa. Pedagogues may not be Technocrats & vice-versa. All in one is an idealistic expectation. But very often there are gaps between idealism & realism. TPCCK demands automatic control systems.

19. Teleprompting & Presentation

The services of teleprompter should be utilised as a prompter not dictator. The teleprompter may prompt, but, the innovation, creation & construction should be left to the discretion of the presenter. In no case the teleprompter should contain and present the entire script.

20. Aspect Ratio of the Presenter, Graphics, Video & Animation

The presenter may verbalise 25 to 30% of the text, rest of the share should be that of graphics, videos and animation. The presenter may exercise kind gestures, so that, even the silent graphs & graphics speak.

21. Constructivist & Connectionist TPCCK

Any Educational Technology Program, irrespective of the form it obtains, such as, Educational Radio, ETV, Computer Assisted Learning Material, Twitter, Watts-app, Mobile-app, WBI, e-Program should be innovative, creative, constructive & connective having novel, decent and cultured serve.

22. F2F Type Techno-Pedagogy

F2F type Techno-Pedagogy facilitates the front view of the Teacher & Video Presentation, both, F2F with the class through the png conversion, say, a virtual graph or a diagram in front of the teacher or the front view of an experimenter experimenting.

23. Culture Compatible Techno-Pedagogy

Though the Techno-pedagogy is fast evolving, but, at the same time it has to be culture compatible.

24. Coherent Composition – People learn better when extraneous material is excluded rather than included. The Technology, Pedagogy and Contents need to be coherently & precisely interwoven.

25. Prompting Techno- Pedagogy - People learn better when cues that highlight the organization of the Technology Pedagogy & essential material are added.
26. Redundancy Principle – People learn better from graphics and narration than from graphics, narration and printed text. It is a fact that composite are the media & modes better & joyful is the reach. But, the media redundancy ought to be avoided.
27. Segmenting Presentation – People learn better when a Techno-Pedagogy lesson is presented in user – paced segments rather than as a continuous unit.
28. Pre – training Principle – People learn more deeply from a multimedia message when they receive pre- training in the names and characteristics of key components.
29. Modality Principle – People learn better from graphics and narration than from graphics printed text. Narratives have been found to have better reach than prints.
30. Multimedia Principle- People learn better from words and pictures than from words alone. The messages need to be judiciously distributed against various senses.
31. Personalization Principle – People learn better from a techno-pedagogic presentation when the words are in conversational style rather than in formal style. Even in a class setting we ought to be impersonally personal.
32. Voice Principle – People learn better when the words in multimedia message are spoken by a friendly human voice rather than a machine voice. Humanistic reach is better than mechanistic throw.
33. Image Principle- People do learn more deeply from multimedia presentation when the speaker’s image is on the screen. Images have their own reach.

Concluding Remarks

There is a rapid evolution of Technology Pedagogy Content Knowledge. There is a move from dot to globe and point to morphology. But techno-pedagogic culture & quality are wanting. There is an ocean of OERs, MOOCs & All Digital, but, digital culture is wanting. We need to evolve & employ techno-pedagogic principles for e-communication. Rather than duplication & replication we need to enter into the realm of innovations & novel productions. Investing Public Exchequer in infinite volumes on digital technology may not have expected returns until we develop digital culture. Digital technology has its own ethos & culture which need to be developed. A large number of Educational Institutions are facing the problem of technology integration & maintenance. There are problems of management & maintenance- preventive, corrective, adaptive and perfective. Returns on investment are very rare.

There is an immediate need to observe techno-pedagogy, rather than producing the programs arbitrarily. The scripter, director, producer, cameramen and the presenter ought to have a lot of understanding. The teleprompter ought to be used as a prompter, rather, than dictator. There ought to be compatible correspondence amongst sender, message, medium & receiver for healthy reach. There is a need to modernise technology in India. TPCK demands our Education System to be Techno-savvy, Pedagogy Expert & Content Master. Techno-Pedagogic Skills should find expression at the operational level. The following composition tries to present digital culture in India.

Digital Culture in India

Innocent Puppets
Decent Parrots
Seen Everywhere
But, Pioneers very rare!

Flocks of Digital Learners
Hocks of Diffident Shepherds
Omnipresent Fully Operational
But, Digital Culture very rare!

Superb Indus- culture
Agriculture Horticulture
Sericulture Every- culture
But, where is Digital Culture?

The Tamed Animals
Pulling Powerfully the Masters
In wild directions wherever desired
Is this what the ICT acquires?

Mega Bytes Giga Bytes
Peta Bytes Tera Bytes
Fastest Food Every Where
But, Nutritive very rare!

Let us sow the indigenous Seeds
Germinate Incubate Create
Construct Connect & Serve
Native Choice! Native Taste!

Digital Wave & Digital Culture
Dedicated Digital Teachers
Can revive the Identity of India
Gracefully Meet the Expectations!

Identity Crisis of Teachers
Evident Here Everywhere
Quintessential Digital Gurus
Are Visible, but, Very Rare!

Why do we fly
If we can afford to walk
Why do we phone
If we can afford to knock & Talk?

Wrap the Repositories
Delete the Depositories
Zap the OERs & MOOCs
If Non-Compatible & Worthless!

Let us meet the digital vision
With patience & perseverance
With innovations & constructions &
Healthy System Design Considerations!

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National Education Day

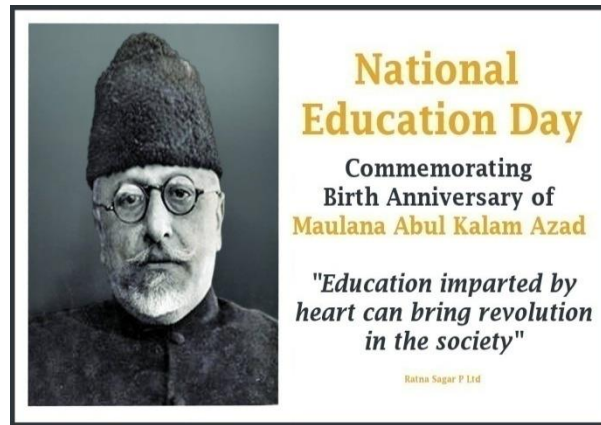
Chhaya Goel
Professor of Education (Retd.)
Devraj Goel
Professor Emeritus

CASE **MSU-VADODARA-GUJARAT-INDIA**

We have many Happy Days, but, there is rare expression of Happy National Education Day. India is a sovereign, socialist, secular, democratic republic. But, there are wide gaps between democratic & republic, that is, PRJATANTR & GANTANTR. Chaos has replaced Peace. We can stand in long queues to withdraw our hard earned money or get the demonetized denomination currency of Rs. 500 and Rs. 1000 changed. It is because we Indians, howsoever illiterate are reasonably educated. It is Education & Education only which can bewitch the mind. There is nothing to feel bewildered & bad about, because, reason is the bond between cause and effect. Reason is RE-AS-ON knowledge base, feeling faculty and skill-scale & speed. Knowledge, feelings and skills have no ultimate. There is knowledge beyond knowledge, there are feelings beyond feelings and there are skills beyond skills. The universe as a whole is not scalable. On one hand we have the empty bowls of beggars, empty stomachs of the poor, the patience & fatigue of the citizens in the long queues, whereas, on the other there are capitalists, over fed and rust outs. If we could sustain our cultural heritage and values, then, we would have not witnessed these days of Black Money & White Money. The scientific realism of the black absorbs and white reflects all the colours is on the fore. How long this black and white dichotomy will continue? In fact the most rich are most poor & most poor are most rich. At times, the administrators have to be harsh with the self and rest. With the sudden declaration of demonetization- the brick batting has stopped, the real estate is in state, the NAKLI currency has stopped, the black money hoarding is under control, the apex reserve is liberated of interest on bonds.“ No action is absolutely good or bad” says Swami Vivekananda. Largely good has some KHAR-PATWAR, whereas largely KHAR-PATWAR has some unseen good plants hidden.

Indian Education is unique. The globe as a whole likes to emulate India Education, teachers, and learners. Truthfulness, compassion and corbearance are the wonderful attributes of Indians. SATTYAM- SHIVAM-SUNDRAM is the LOGO of mother India. TALEEM HAMARI DAULAT HAI, TAHZEEB HAMARA GAHNA HAI. It is Education & Education only which can bewitch the mind.

11th of November is celebrated as National Education Day in India commemorating the Birth Anniversary of Maulana Abul Kalam Azad.



Maulana Abul Kalam Azad was Indian Scholar and a Senior Political Leader of the Indian independence movement. He was the first Minister of Education in the Indian Government. In 1992 he was posthumously awarded India's Highest Civilian Award, the BHARAT RATNA. He is commonly remembered as Maulana Azad. Maulana is an honorific meaning 'Learned Man'. He had adopted Azad (Free) as his pen name. His contribution to establishing the Education Foundation in India is recognized by celebrating his birthday as "National Education Day" across India. He was also a renowned scholar, and poet. He was well versed in many languages viz. Arabic, English, Urdu, Hindi, Persian and Bengali. He was a brilliant debater, as indicated by his name, Abul Kalam, which literally means "Lord of dialogue". He adopted the pen name Azad as a mark of his mental emancipation from a narrow view of religion and life. Maulana Abul Kalam Azad was born on November 11, 1888 in Mecca. His forefathers came from Herat (a city in Afghanistan) in Babar's days. Azad was a descendent of a lineage of learned Muslim Scholars, or Maulanas. His mother was an Arab and the daughter of Sheikh Mohammad Zaher Watri and his father, Maulana Khairuddin, was a Bengali Muslim of Afghan origins. Khairuddin left India during the Sepoy Mutiny and proceeded to Mecca and settled there. He came back to Calcutta with his family in 1890. Because of his family background Azad had to pursue traditional Islamic Education. He was taught at home, first by his father and later by appointed teachers who were eminent in their respective fields. Azad learned Arabic and Persian and then philosophy, geometry, mathematics and algebra. He also learnt English, World History, and Politics through self study.

Azad was trained and educated to become a clergyman, He wrote many works, reinterpreting the holy Quran. His erudition let him to repudiate Taqliq or the tradition of conformity and accept the principle of Tajdid or innovation. He developed interest in the pan Islamic doctrines of Jamaluddin Afghani and the Aligarh thought of Sir Syed Ahmed Khan. Imbued with the pan-Islamic spirit, he visited Afghanistan, Iraq, Egypt, Syria and Turkey. In Iraq he met the exiled revolutionaries who were fighting to establish a constitutional government in Iran. In Egypt he met Shaikh Muhammad Abduh and Saeed Pasha and other revolutionary activists of the Arab world. He had a first hand knowledge of the ideals and spirit of the young Turks in Constantinople. All these contacts metamorphosed him into a nationalist revolutionary. On his return from abroad; Azad met two leading revolutionaries of Bengal- Aurobinto Ghosh and Sri Shyam Sundar Chakravarty, and joined the revolutionary movement against British rule. Azad found that the revolutionary activities were restricted to Bengal and Bihar. Within two years, Maulana Abul Kalam Azad helped set up secret revolutionary centers all over north India and Bombay. In 1912, Maulana Abul Kalam Azad started a weekly journal in Urdu called Al-Hilal to increase the revolutionary recruits amongst the Muslims. Al-Hilal played an important role in forging Hindu-Muslim unity after the bad blood created between the two communities in the aftermath of Morley-Minto reforms. Al-Hilal became a revolutionary mouthpiece ventilating extremist views. The government regarded Al- Hilal as propagator of secessionist views and banned it in 1914. Maulana Abul Kalam Azad then started another weekly called Al-Balagh with the same mission of propagating Indian nationalism and revolutionary ideas based on Hindu-Muslim Unity. In 1916, the government banned this paper too and expelled Maulana Abul Kalam Azad from Calcutta and interned him at Ranchi from where he was released after the First World

War 1920. Maulana Abul Kalam Azad served as the first Education Minister in independent India from 1947 to 1958. He died of a stroke on February 22, 1958. For his invaluable contribution to the nation, Maulana Abul Kalam Azad was posthumously awarded India's highest civilian honour, BHARAT RATNA in 1992.

The emerging question is how many of us have liberated ourselves from Caste, Creed, Region, Religion, and Parties as Maulana Azad? How many of us have transcended ourselves of Time, Space, & Mind? How many of us are universal birds? Let us visit Al-Hilal, the crescent moon, the rare revolt, the rare fire, contributing to AZADI of India of the British regime.

Scenario of Indian Education

History

Maulana Abul Kalam Azad envisaged strong central government control over education throughout the country, with a uniform educational system. The Union government established the University Education Commission (1948–1949) and the Secondary Education Commission (1952–1953) to develop proposals to modernize India's education system. The Resolution on Scientific Policy was adopted by the government of Jawaharlal Nehru, India's first Prime Minister. The Nehru government sponsored the development of high quality scientific education institutions such as the Indian Institute of Technology. In 1961, the Union government formed the NCERT as an autonomous organization that would advise both the Union and state governments on formulating and implementing education policies.

First Education Policy of India (1968)

Based on the report and recommendations of the Education Commission (1964–1966), the government of Prime Minister Indira Gandhi announced the first National Policy on Education in 1968, which called for a "radical restructuring" and equalize educational opportunities in order to achieve national integration and greater cultural and economic development. The policy called for fulfilling compulsory education for all children up to the age of 14, as stipulated by the Constitution of India, and the better training and qualification of teachers. The policy called for focus on learning of regional languages, outlining the "three language formula" to be implemented in secondary education - the instruction of the English language, the official language of the State where the School was based, and Hindi, the national language. Language education was seen as essential to reduce the gulf between the intelligentsia and the masses. Although the decision to adopt Hindi as the national language had proven controversial, the policy called for use and learning of Hindi to be encouraged uniformly to promote a common language for all Indians. The policy also encouraged the teaching of the ancient Sanskrit language, which was considered an essential part of India's culture and heritage. The NPE of 1968 called for education spending to increase to six percent of the national income.

Second Education Policy of India (1986)

Having announced that a new policy was in development in January, 1985, the government of Prime Minister Rajiv Gandhi introduced a new National Policy on Education in May, 1986. The new policy called for "special emphasis on the removal of disparities and to equalize educational opportunity," especially for Indian women, ST and the SC communities. The NPE called for a "child-centered approach" in primary education, and launched "Operation Blackboard" to improve primary schools nationwide. The policy expanded the Open University System with the IGNOU, which had been created in 1985. The policy also called for the creation of the "rural university" model, based on the philosophy of Indian Leader Mahatma Gandhi, to promote economic and social development at the grassroots level in rural India.

Indian National Policy of Education

The 1986 National Policy on Education was modified in 1992 by the P.V. NarasimhaRao Government. In 2005, Prime Minister Manmohan Singh adopted a new policy based on the "Common Minimum Programme" of his United Progressive Alliance (UPA) government. Programme of Action (POA), 1992 under the National Policy on Education (NPE), 1986 envisaged conduct of a common entrance examination on all India basis for admission to professional and technical programmes in the country. For admission to Engineering and Architecture/Planning programmes, Government of India vide Resolution dated 18 October 2001 has laid down a Three – Exam Scheme (JEE and AIEEE at the National Level and the State Level Engineering Entrance Examinations (SLEEE) for State Level Institutions – with an option to join AIEEE). This takes care of varying admission standards in these programmes and helps in maintenance of professional standards. This also solves problems of overlaps and reduces physical, mental and financial burden on students and their parents due to multiplicity of entrance examinations.

Historical Scenario of Education Policy

State following wrong Education Policy

Lok Janasakathi Party (LJP) General Secretary, Harbhajan Singh Lakha on Tuesday criticised the education policy of the UDF government in Kerala. Talking to reporters here, he said the government's education policy was wrong and it has become difficult for poor students to continue higher education, especially in professional courses. Referring to the suicide of engineering student Rajani S. Anand in July last, he said financial problems forced her to...(PTI, THIRUVANANTHAPURAM , December 14, 2004)

SC Stays New Education Policy

The Centre's New School Education Policy was stayed by the Supreme Court on Friday. The apex court also issued notices to the Union Human Resources Development Ministry, Central Board for Secondary Education (CBSE), NCERT, and National Human Rights Commission (NHRC) in this regard. before ordering a stay on the implementation of the controversial Education Policy, the court had asked the lawyers appearing for the centre, (TNN, New Delhi, March 2, 2002)

Front bats for FYUP Rollback

With the assembly elections due in several states, including Delhi, in 2013 and the general elections in 2014, a national convention on education policy on Sunday decided to organize a countrywide agitation in defence of a government-funded education system. The convention, organized in the capital by the Joint Action Front for Democratic Education, a conglomerate of student and teacher bodies, sought to put pressure on political parties to make education a serious political agenda and fight... (TNN, New Delhi, September 9, 2013)

Meghalaya Teachers boycotted the official Teachers' Day function

Thousands of teachers boycotted the official Teachers' Day function and instead announced statewide strike against the state government's refusal to meet their demands from September 11. Deputy chief minister R C Laloo, who also holds the education portfolio, said his doors were always open for the teachers to hold talks. Instead of attending the official function organized by the state government on Teachers' Day, about 10,000 teachers from... (TNN, Shillong, September 6, 2013)

New Education Policy Has Loop Holes

In a seminar titled 'Present Education Policy: Student, School and Parent', organized by the Ranchi Parents Association, pros and cons of the present government education policy was discussed on Wednesday. Many parents and teachers think that the Right to Education Act which enables every child to attend school is a positive move by the government but promotion of a child every year despite his academic performance is not a proper thing to do. "The government is

coming up with new policies...(TNN, Ranchi, May 10, 2012)

Strike for Apt Educational Policy

Akhila BharatiyaVidyarthi Parishat (ABVP) activists will stage a demonstration in front of the residence of MP Pralhad Joshi on Saturday as part of their nationwide strike for a comprehensive education policy to fight the commercialization of education. Briefing reporters here on Thursday, ABVP state secretary VinayBidre said such protests will be carried out in front of the residences of all MPs. "Because of the comercialization, the dalits and those from... (TNN, HUBLI, Aug. 5, 2010)

Frame Education Policy for the Disable

The Delhi high court has asked the state government to formulate a proper admission policy for physically challenged candidates. The court said they should be given at least three per cent seats in its various educational institutions. Justice VikramjitSen gave this direction on a petition filed by KamleshChellani who was allegedly denied admission to the Bachelor of Education (B Ed) course of Guru Gobind Singh IP University. Chellani was not granted admission despite... (TNN, New Delhi, July 28, 2003)

BJP to agitate against Government Education Policy

The BJP's Kerala unit will launch an agitation on June 23 against the 'commercialization and communalization' of the education sector all over the state. BJP state general secretary, Raman Pilla, told reporters at the party head-office here that the party would hold district level protest meetings all over the state against the education policy on that day. The future course of action would be decided later, he added. The BJP state...(PTI, THIRUVANANTHAPURAM, July 21, 2004).

Comprehensive Education Policy: Central Legislation Sought

Karnataka Chief Minister Dharam Singh on Sunday said a comprehensive national education policy and a Central legislation would address issues that have emerged due to the ongoing confusion for admission in professional colleges in the state. "Our belief is that a comprehensive national policy is the only answer for clearing the confusion and a Central legislation is important for finding a lasting solution (on the admission muddle)," Singh said in his... (Bangalore, Aug. 16, 2004)

Teachers of non-aided schools stage protest

On Wednesday, a large number of teachers of non-aided schools gathered and took out a procession raising slogans against the education policies of state government. They reached at the district magistrate office and staged a sit at the office campus. ChatrapatiShukla, district president of 'UP Non-Aided MadhyamikShikshakSangh' said, "The education policy in the country is not in the favor of teachers of non-aided school. The state government boasts that it is spending...(TNN, Gorakhpur, Sept. 5, 2013)

Meghalaya Teachers Plan Stir Against Insensitive Minister

College and school teachers under the aegis of the Joint Action Committee of All Teachers' Associations of Meghalaya (JACATAM) have crossed swords with Meghalaya deputy chief minister Roytre Christopher Laloo for the latter's constant refusal to discuss several welfare issues of the teachers. Miffed over the alleged 'insensitivity' of the deputy chief minister, who also holds the education portfolio, towards their cause, the teachers have announced a series of...(TNN, Shillong, Aug. 23, 2013)

Govt. mulls higher education policy to improve quality

For improving the dismal scenario of higher education in the state, the government will soon come up with a dedicated policy on it. Quality, employability, research and private sector participation are likely to be the core focus areas of 'higher education policy'. The state planning board (SPB) in a joint collaboration with six eminent universities is working on a draft which will

be discussed by leading educationists on August 31 and July 1. Planning board has... (TNN, Jaipur, Aug. 19, 2013)

Dance use to portray Bapu's principles today

For the first time in Bihar, ace dancer Padmashri Geeta Chandran would portray through her dance the six principles of Mahatma Gandhi on Sunday. Prepared with the fusion of Bharatnatyam and contemporary movements, the one-hour performance will portray Gandhian philosophies namely 'brahmacharya', 'satyagrah', 'ahimsa' (peace), 'jati' (caste), 'shram' (labour) and love for khadi. "Gandhi started his Satyagrah movement in Bihar. So the performance is significant...(TNN, Patna, Aug. 18, 2013)

SC refuses to pass interim order on JEE controversy

The Supreme Court on Thursday refused to pass interim order on a plea challenging the policy for deciding the merit list of students for admission in government-funded engineering colleges based on 12th board marks and joint entrance exam (JEE). A bench of Justices H Dattu and Justice Dipak Misra, however, agreed to hear the plea of parents of engineering aspirants, who challenged the new "normalization" policy. The bench said that it would hear the petition on merit...(PTI, New Delhi, July 11, 2013)

State scores poorly in tribal education

Odisha is still lagging far behind when it comes to tribal education, reveal statistics. The literacy rate among tribal in the state is only 37% against the general literacy rate of 63%. Moreover, the dropout rate at Class V is almost 50%, while only 2-4% of tribal students pursue higher and technical education. The pitiable scenario can improve if a mother tongue-based early childhood care and education policy is implemented for tribal in the state, argued experts. (TNN, BHUBANESWAR, July 10, 2013)

Court stays Institute of Educational Technology closure

The Orissa high court has stayed closure of State Institute of Educational Technology (SIET), an autonomous organization to promote technology in school education. The government had notified the closure on April 29. Acting on a writ petition by 11 SIET employees, a bench of Justices M M Das and B K Mishra on May 15 issued the stay order. "If the state is proposing to close down SIET, such order of closing down shall not be implemented without...(TNN, Bhubaneswar, May 19, 2013)

Many a imbalances in Indian Education

It is evident through the news flags, such as, presented above, that, there have been many a imbalances in Indian Education, namely, public-private dichotomy, Legislative-Executive-Judiciary divergence, commercialization, indifference towards the disadvantaged groups, Quality of Education, Relevance of Research, Gross Enrolment Ratio, Pupil-Teacher ratio, Gender Parity Index, Per Student Expenditure, Employability of the Higher Education Pass-outs.

Developments in Indian Education

- SarvaShikshaAbhiyan (SSA)/ Right to Education (RTE)
- National Programme for Education of Girls at Elementary Level (NPEGEL)
- RashtriyaMadhyamikShikshaAbhiyan (RMSA)
- Inclusive Education for the Disable at Secondary Stage (IEDSS)
- Saakshar Bharat/Adult Education
- RashtriyaUchchatarShikshaAbhiyan (RUSA)
- NROER- National Repository of Open Education Resources: It is an initiative of the MHRD, GoI and CIET-NCERT to bring together all digital and digitisable resources across all stages of School Education & Teacher Education. Resources are available in 29 different languages. E-resources of NROER can also be accessed offline through school

server.

- e-PGPathshala: It is an initiative of the MHRD under National Mission on Education through ICT (NME-ICT). The modules for M.Ed. and M.A. Education are being developed jointly by the University of Allahabad and CIET-NCERT. These modules will be available on the following web sites:

<http://epgp.inflibnet.ac.in>

<http://eacharya.inflibnet.ac.in>

<http://nroer.gov.in>

- SWAYAM- Study Webs of Active-Learning for Young Aspiring Minds
- SWAYAM PRABHA- The SWAYAM PRABHA has been conceived by the MHRD, GoI as the project for using the two (2)-GSAT-15 transponders to run 32 DTH channels which will telecast high quality educational programs on 24X7 basis. Every day, there is new content of at least 4 hours which is repeated 6 times a day. MHRD has nominated NCERT as the National Coordinator for one such channel. CIET-NCERT has planned to disseminate curriculum based ETV programmes for class IX-X and XI-XII through DTH –TV transmission.
- MOOCs for PG Students
UGC is the National Coordinator for development of MOOCs for non-technical post-graduate degree programs. CIET, NCERT is developing MOOCs for the subject of Education. The courses developed so far have been hosted on SWAYAM. A learner can earn certificate/credits on successful completion of any course on SWAYAM.

All India Survey on Higher Education (AISHE)

To portray the status of higher education in the country, Ministry of Human Resource Development has endeavoured to conduct an annual web-based All India Survey on Higher Education (AISHE) since 2010-11. The survey covers all the Institutions in the country engaged in imparting of higher education. Data is being collected on several parameters such as teachers, student enrolment, programmes, examination results, education finance, infrastructure. Indicators of educational development such as Institution Density, Gross Enrolment Ratio, Pupil-teacher ratio, Gender Parity Index, Per Student Expenditure will also be calculated from the data collected through AISHE. These are useful in making informed policy decisions and research for development of education sector.

Identity of Education

Some of the Universities in India, both, old and new, such as, University of Guwhati, University of Mumbai, Ravenshaw University are conferring Doctoral Degrees in Education under the Faculty of Arts. Education is not even considered by them an entity and faculty. So, the question of identity does not arise. Education which is unconditional greatest Service in Society has not been recognized by the Service Sector in India. UPSC in India has failed to include Education as a discipline. *Some think that Education has only a little core, but, more of periphery. Education suffers from the missing elements of unique discipline which are non replicable in other disciplines.* It seems that such thinkers have failed to think and appreciate that Education is the core of every discipline. Education is interdisciplinary. All the disciplines emerge from Education and merge into Education. Education does have a unique body of knowledge, a repertoire of unique skills and attitudes and a code of conduct. As the code of conduct of a doctors is –“We will keep serving the humanity without considering our comfort or discomfort.” Similarly, the code of conduct of an Educationist is –“We will strive for Integral Humanism & Universal Being. Some may use and abuse GURUS, Guardians, Teachers, Masters, recursively, ridiculously; forgiving every misdeed, they will be nurtured, so that, they make Teachers their Patterns to Live & to Die. If we find some people worried about ARTH & KAAM & callous towards DHARM & MOKSH, we will persuade them to initiate correction.” Can we estimate the energy, purity and strength of the Soul of Education? Warriors may win at times physically, it is Education which

only through knowledge can bewitch the minds and liberate the souls. We always feel proud of the teachers who taught us and who are teaching us. Their text is its own testimony. They do not require testimonials. The globe strives to emulate Indian Teachers & Learners.

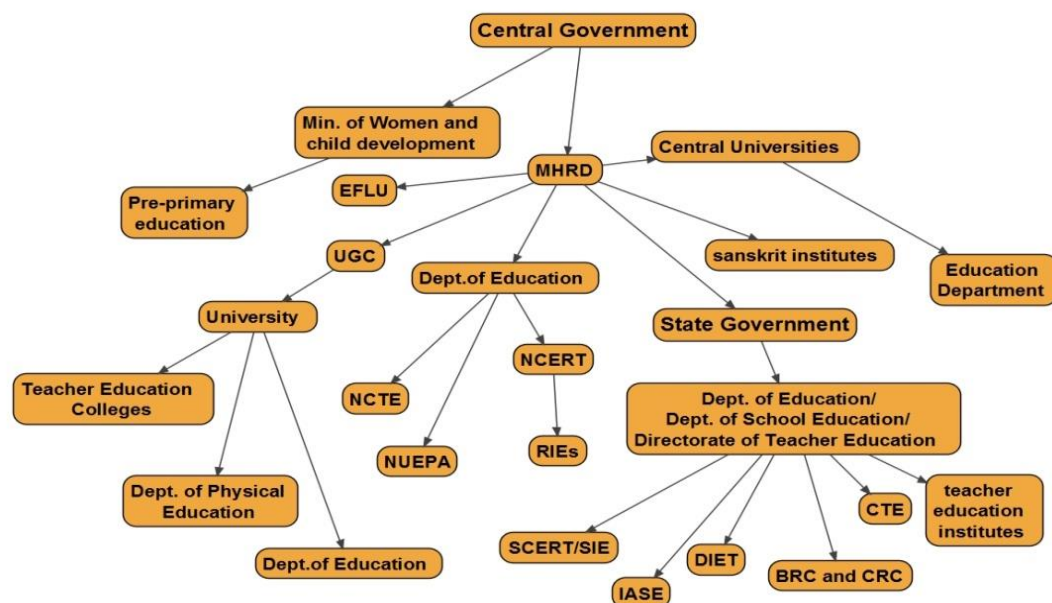
Developmental Challenges of India

We have many a developmental challenges, such as, Assimilating the globalization, Continuous updating of Knowledge & Skills, Creating new age institutions, Balancing materialism and values of orient, Phantom use of Resources, Trans-planet technology stabilization, Working with multiple languages and multiple cultures, Meeting the climatic & environmental challenges, Sustaining development, Collaborative Living, Wholistic development, Developing Vocational Skills, Enhancing Communication Skills, Quality control, Removing Public Private dichotomy, Controlling Rising materialistic values, Realizing even distribution, Controlling Ecological imbalances, Fair Recognition, Valid Accreditation, Sustaining Symbiosis, Respecting Cultural Heritage, Sustaining sensitivity to the basic values, Convergence of State, Society, Education & Judiciary, Respecting Rights of all, Transcending time, space & mind, India which has had the grace of being contented, peaceful, healthy, happy, beauteous, cultured society is moment by moment losing its natural bliss & beauty, We have become insensitive to our Indian Heritage of peaceful struggle, Each one of us needs to recreate, revive and refresh ourselves wholistically to value our heritage and build a Strong, Powerful, Cultured, Dedicated, Gracious and Pioneer India.

TET, TAT, NET & SLET

What are these Tests indicators of ? We the Educational Institutions have started disowning our own products. Convocations without invocation are valueless. *Could we culture the quality of Indian Education and do away with all such Tests? WE should be sensitive to all the parameters of the Education System. Norms should be evolved for all the parameters- Input, Process and Output.*

Structure of Education:



The Education has become stagnant over years, rather, there is degeneration of Educational Institutions. There is no change in Names, in Structures, in Functions, whereas, there is drastic change in the Society and Environment. When will we start renewing our own selves? Every unit in Education should renew itself. We cannot overthrow Education System overnight. Our Education Policy should resonate with our challenges & strengths, sources & resources, sensitivities & sensibilities, Vision & Mission. Our Education Policy should be guided by the Soul of our Soil.

KALA UTSAV (2016)

The second National KALA UTSAV was organized by the NCERT under the aegis of the MHRD from November 15 to November 18, 2016 in the NCC Campus of the Delhi Cantonment area. More than 1700 persons participated (1400+ children including CWSN and their teachers). The KALA UTSAV included Visual Art, Dance, Songs & Theatre. The interaction amongst the various art forms resulted into Unity into Diversity. It was a marvelous UTSAV of United India. Every form of visual art, thoroughly fully resonating each dance, every song emanating from the depth of heart & soul, each & every play re-presenting our states presented our ethos. The momentum in the motor muscles of the children and vision of their eyes, melody of their voice and sound of their steps, still echoes & re-echoes promising the wonderful state of India.

Education & ICT Infusion

Education Programs are largely traditional. Pace of modernization is very slow. We have not yet been in a position to infuse the technological innovations for transacting the education. There is more of knowledge deepening than knowledge construction. We have rare patents in Educational Technology.

A sizable number of studies on effectiveness of CAI developed through various computer languages employing either pre-experimental design or quasi experimental design reveal significant mean score gain from pre-test to post-test. Studies on the effectiveness of CAI reveal favorable reactions of students and teachers towards the CAI. (Prabhakar 1989; Himani 1990, Mahapatra 1991, and Adhikari 1992, DAVV, Indore; Khiwadkar 1999, Zyoud 1999, Yadav 2000, GoelKhirwadkarTomar Das & Joshi, 2000, Macwana 2004, Sharma 2005, Barot 2005, Pradesi 2005, and Rathod 2005, MSU; Suwana 2004, SGU; Upadhyaya 1999, MJP Rohilkhand University, Bareilly; Sanjana2001, MDU and Pandian 2004, DU)

There have been found rare studies on the pedagogic/techno-pedagogic analysis of the computer based educational instructional programs. These studies reveal that there should be added focus on production variables, pedagogic principles and spatial and temporal contiguity of various message forms (Patel, 2001,MSU; Chaudhari,2005, MSU).

Computer as a medium has been found to have the potency of addressing the heterogeneity in terms of variables, namely, IQ, Interest, Motivation, Language level (Zyoud, 1999, MSU).

There are rare studies on effectiveness of CALM in various modes, namely, text, graphics, text & graphics, text, graphics & music. It has been found that the composite modes may not always ensure higher level of language learning (Das, 1998, MSU).

Very few studies have been conducted on the relative effectiveness of CAI with peer interaction in mono, diad and triad (Pardesi,2005, MSU).

Attempts have been made for designing, developing and implementing computer based Learning Resources Management System (LRMS). The automated LRMS has been found definitely more effective than the the manual LRMS (Beryah, 1995, DAVV).

A few studies have been conducted on the relative predictivity of various variables with respect to the criterion variable, namely, Educational Proficiency (Mishra, 1993, DAVV; Goel,2003, MSU).

A study conducted on Time Space Personnel Management System revealed that the computer based TSPM system was found relatively more acceptable and better functional than the manual TSPMS (Biswal, 1995, DAVV).

Though studies have been conducted on the automation of examination system, yet these studies find rare expression at the functional level. Teacher Education Institutions need to promote Choice Based Credit System and on demand examination (Mahajan, 1993, DAVV; Joseph, 1993, DAVV; Shinde, 1993, DAVV; Goel, 1997, MSU).

A sizeable number of teacher education institutions in India have initiated into ICT in Education either as a core course or as optional course. In spite of the impeding factors, namely, limited staff, inadequate laboratories with maintenance problems, sizeable classes, the courses have been found to realize their objectives reasonably (Goel, Das, and Shelat, 2003, MSU). A sizeable number of teacher education institutions have been found lacking facilities, such as, Internet, MS Publisher, Acrobat Reader Goel, 2005, MSU). A few studies conducted on the use of Internet in Teacher Education Institutions revealed that the student teachers largely lack in info-savvy skills and techno-pedagogic skills (Joshi, 1999, MSU; Dhodi, 2005, MSU)

Some of the teacher trainees make use of Internet for surfing, e-mail, research, core courses, special areas. But, the Internet is rarely used for web designing, reflective dialogue and outsourcing. Measures of Internet safety are rarely employed. There is a need to develop Net-Savvy Skills in Teacher Educator Trainees (Goel, 2006, MSU). Some Studies have been conducted on bridging the gaps between teaching styles and learning styles. The studies are appreciable but there is a need to conduct many more studies Rathod (2005, MSU). Studies conducted on language instruction through Power Point Presentations on realizing communicative and functional languages have been found to go a great way in integrated. Technology in Education is still under utilized. There is Technological revolution in Teacher Education. There is a shift from Bachelor of Teaching to Bachelor of Learning, that too, Bachelor of e-Learning. There is a shift from e-Learning 1.0 (Online learning) to e-Learning 2.0 (Tweeters, Face-book) to e-Learning 3.0 (Semantic Web) , that is, from content to community to Artificial Intelligence. There is a quick shift from web-1 to web-2 to web-3. We have initiated into Open Education, Open Course Ware, Open Source Software, Open Content and Open Research. There are proposals for e-Teacher Education. Smart Classrooms are emerging, wherein, we have e-learning and e-testing. Terms like Wi-Fi, iPad, e-Book, e-Reader, e-News Letter, Webinar are widely used. Digital Lesson Designs and e-Portfolios have become common features. There are compendiums of e-abstracts and Surveys of Educational Research in India on the World Wide Web. There is wide scope for transformation of Teacher Education through Technology.

Goel Devraj (1989) designed, developed & implemented two degree Programs Bachelor of Computer Education (B.C.Ed.) and Master of Computer Education (M.C.Ed.) at School of Education, Devi Ahilya Vishwavidyalaya, Indore, Madhya Pradesh, India. The pass out of these Programs are domain leaders, particularly, ICT in Education, globe over.

Helaiya Sheetal (2011) conducted a doctoral study on enhancement of life skills through development and implementation of a Life Skills Program for Secondary Student-Teachers. The Ten Life Skills identified by the WHO were considered for the study. An exhaustive attempt was

made to differentiate all these Life Skills into various components. Number of Activities were designed, developed and implemented to enhance the Life Skills. The Life Skills Program was implemented on the Pre-Service Teachers during 2008-2009 at the Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, India. Post-intervention scenario on the Life Skills of the Student-Teachers revealed that there was a remarkable gain in their Self Awareness Skill, Effective Communication Skill, Interpersonal Relationship Skill, Coping with Emotions Skill, Decision Making Skill and Problem Solving Skill. There was moderate gain in their coping with stress skill, Empathy Skill, Critical Thinking Skill and Creative Thinking Skill. The most impeding factor in life is that most of us lack Self Awareness Skill, that is, neither we know our strengths, nor do we know our weaknesses. We do not know our goals. As a result we are poor in many other life skills. If we fail to identify with the self, then we fail to identify with others also, that is, we lack empathy skill. Creative Thinking Skill and Critical Thinking Skill, both in one, is a rare combination. We need to learn how to zoom out and zoom in. The complexities of life are increasing day by day. We need to learn how to cope up with the stress and emotions. We need to learn how to be our own selves and equally how to be one with the others. We need to realize healthy constellation through empathy, interpersonal relations and effective communication. We need to make right decisions, timely. Teachers need to possess healthy life skills for development of healthy society. So the Life Skills should be integrated in Teacher Education.

Archana Dutta (2011) designed, developed and implemented a Program to enhance the emotional skills of Secondary Level Student Teachers. Student Teachers of varied personality attributes were significantly benefitted through the intervention Program. The study has very well demonstrated that how the natural, spontaneous, powerful emotional outbursts can be peacefully regulated, within reasonable time, through scientifically designed skills.

Dhodi Nayana (2012) conducted a doctoral study on Development of Info-Savvy Skills in Student Teachers. The study demonstrates very well how the info-savvy skills of Asking, Accessing, Analyzing, Applying and Assessing were developed in the Pre-Service Teachers of India through surfing on Cultural Heritage of India, Buddhist Heritage of India and on their domains of disciplines. It is a joyful experience to travel through this research volume experiencing various surfing skills, viz., skimming, scanning, authenticating, hyper-linking, switching, skipping culminating into Educational Immersion for seeking solutions

Vaidehi P. Gupta (2013) conducted a Study- Role of ICT for Wholistic Development of the Student Teachers. It is evident from the study that ICT does play its role in wholistic development of Student Teachers. We need to extend the role of ICT for development of all the domains wholistically.

Bharati Ganiger (2014) conducted a study on ICT aided Constructivist Approach for Professional Development of the Pre-School Teachers. The ICT aided constructivist approach was found to be significantly effective.

Chhaya Goel & Devraj Goel (2016) conducted a study on evolving a Taxonomy of Educational Skills. The taxonomy of Educational Skills thus evolved contains 14 domains, which have been further differentiated into various skills.

A website has been constructed at CASE Vadodara, namely, www.icorecase.org. the objective is to share Educational Research & Educational Experiences globally. Some of the volumes uploaded are- Collective Wisdom of India, Researching Pioneer Competencies of India, Universe of Swami Vivekanand& Complete Wholistic Social Development, Compendiums of Educational Research, SAP SPECTRUM, Taxonomy of Educational Research, and Scenario of Doctoral Research at the MSU.

e-Compendiums of Doctoral Research in Education (Five Volumes) have been constructed (

Goel C., Goel D. , Madhvi, Meghavi & Asit) which are available on the web sites www.icorecase.org and www.educationinindia.net.

Two books- EKATAMAK ASTITAV and ANUPRANIT ANUBHOOTI have been uploaded on the web site www.issuu.com/devrajgoel containing poems composed by Anshul Goel & Devraj Goel and edited by Chhaya Goel (2016).

Recently an International Forum on Adopting an ICT Perspective to Education and Learning was organized by the NCERT in collaboration with UNESCO- UNESCO Institute of Information Technologies in Education, International Bureau of Education in partnership with Google. Participating countries included Azerbaijan, Botswana, Egypt, Gabon, India, Lithuania, Oman, Seychelles, Saudi Arabia and Swaziland. Experts from Brazil, Mauritius and the United States also participated. IBE partner Google contributed significantly not only through financial support, but by providing experts to facilitate different Forum sessions. From India a group of officials/faculty representatives RMSA, SCERTs, School Teachers, National ICT Awardees, NCERT and Senior Officials from MHRD- GoI and autonomous bodies under MHRD-GoI also participated. The forum sessions were interactive with hands-on experiences. There was a site visit to SANSKRITI SCHOOL which uses Google Application for Education. Also, there was an ICT Fair to showcase the tools and resources from the participating countries. The return of the international forum was functionally substantive with respect to ICT perspective to Education and Learning.

Here are a few suggestions:

- We should try to differentiate source and resource. It has become a fashion to label entities as resources. Let us learn to love & adore nature as source rather than even thinking of re-sourcing it.
- Apex agencies & Institutes of India should justify their names. We do not require sophisticated structures in the name of apex Institutions. We need Institutions of excellence & universities of universal character.
- We being an Honest & Cultured Nation respect the constitution of India. We are expected to keep our palms on the Preamble of Indian Constitution and SANKALP to observe it in each & every deed & action, irrespective of who we are.
- Identity of each & every Individual entity & Institution deserves recognition, otherwise, we cease to be. While being in greater power, it takes no time to delete, but, it takes life time to construct & connect. Any deletion has to be done more carefully, sensitively & sensibly. History has its own essence. It is not all gone.
- Any General Body, of any agency of India, if seeks public opinion on any Issue, then the public opinion ought to be duly respected. If public has faith in us, we should also have faith in public. Truthfulness, Compassion & Forbearance are the most beautiful attributes of India. This is how India is known since ages.
- We should, simultaneously, focus on the entire system of Education. The isolated part approach has little returns. Along with Elementary Education ABHIYAN, Secondary Education ABHIYAN, RASHTRIYA UCHCHHARTAR SHIKSHA ABHIYAN, could we initiate WHOLISTIC EDUCATION ABHIYAN?
- Courses, such as, Corporate Social Responsibility & Education, Health Education in India, Taxonomy of Educational Skills, Technology Integrated Education, Inclusive Education ought to be introduced.
- New Education Policy should ban Parallel Private Tuition Classes. The beauties of learning need to be respected. We cannot afford to mechanize learning.

- There should be due focus on both the hard skills and soft skills in our Professional Programs.
- ICT ought to be fully utilized for sustainable development, that is, Socio-Economic-Environment development.
- Media culture should emerge out of the media crowd. Due measures have to be taken to control media addiction. There is a need to develop e-civilization.
- Education should develop liberation capabilities through reason, religion and rapport, where, reason is re-as-on knowledge, feelings and skills, because there is no ultimacyof knowledge, feeling and skills. Religion is to be one with the creator and Rapport is unconditional love for all.

Concluding Remarks

The ultimate aim of Education is development of Universal beings. It deals in full, meaningful, happy, healthy, resonating and sustainable life of every organism & entity. There is need to move from Human Development Index to Universe Development Index- the ethos of Indian Education, the history as well as, vision & religion of India. There is a caution that progressively we are becoming market oriented than society oriented, profit oriented than service oriented, resource oriented than source oriented. Technology quotient is trying to superimpose intelligence quotient, emotional quotient, spiritual quotient, health quotient, and environment quotient. We are busy with the reviews than views. We are busy with deletion than construction and connection. It is high time that we revive our heritage & culture which is full of truth, compassion and forbearance. It is high time that we realize SHUBH LABH, that is, hard earned Profit through determination & action with full immersion seeking the beauties of life & living. The first & ultimate aim of Indian education is to realize universal beings. India is striving for wholistic development of all, where, each bud blossoms, blooms, and spreads fragrance. We feel proud being the product of Indian Education, where, we have the right to education. We have been constructed through the persistent patience, competence and struggle of our teachers. Our Educational Institutions have been and are the learning organizations in the prayer, in the classroom, in the corridor, in the library, in the laboratory, in the play fields, in the Health Center, in the community, everywhere. That is why the globe at large aspires to emulate Indian Education. There is an immediate need for Indian Education to strengthen & sustain its Universal Identity.

With all ifs and buts, the Indian Education will continue serving the universe with all dedication, addressing all problems of all. New Age Institutions are being created and old age renewed for continuous updating of knowledge and skills, developing inner power and social ethos. There is progressively phantom use of resources. Symbiosis, peace & harmony, health & hygiene, production & Marketing, Scholarship & Exchange, indigenous creation & trans-creation, research & construction are becoming the salient features of Indian Education. Let us revive & modernize Indian Education. Come, Join, Celebrate & Exhilarate Education! HAPPY NATIONAL EDUCATION DAY! India.

Could we aspire for Indian Class Education which is service oriented, society oriented and Life oriented than Profit Oriented & Market Oriented. Go to any forum, be, it the Court of an Indian University or Annual Day of the Schools there is a standard slogan- WORLD CLASS EDUCATION. What is that World Class Education, perhaps no one knows. The following poem tries to present the World Class Scenario feel.

World Class Education: Desire & Acquire

Where anxiety & aggression
 Trigger in classrooms blind fire
 Kill the innocent including self
 Is this what the World Class Acquires!

What use are the Saints & Shrines;
With indoor & outdoor daily crimes?
Is this the Chaos which Peace Aspires
Is this what the World Class Acquires!

What use are Knowledge Societies & Conventions
What us are Science Technology & Inventions
When the immediate neighbour border fires
Is this what the World Class Acquires!

What use is the Blue LED
What use is the Cognitive GPS
If it is the darkness which light desires
Is this what the World Class Acquires!

What use is the International Outlook
What use is the Global Citizenship
If we are bent on War & Fires
Is this what the World Class Acquires!

Criminals find abode in the Grand Hostels
Failing the High Intelligence Vigilant Bureaus
Is it the intelligence we design & desire
Is this what the World Class Acquires!

Let us Peace & Harmony Aspire
Shedding off the World Class Desire
Universal Being - the Ultimate State
We envision, determine & acquire.

In the rut & race of becoming smart we may not lose Indian ethos. We need to sustain & develop India without identity loss. We need to be innocent & vigilant, respectful & respected, Producers & Consumers (Prosumers), beautiful and beautifying, kings & queens of heaven and decent children of mother earth. With all ifs and buts, we, feel proud of our Education. On every 11th of November we salute Maulana Abul Kalam Azad, as proud Indians reviving, renewing & sustaining the identity of Indian Education.

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Scaling Educational Skills

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Abstract

The paper takes off with a question that whether the Educational Skills are Universal. How to dissolve the democratic and totalitarian dichotomy in the institutionalization of Educational Skills? It tries to scale the status of Teacher Educators on a Taxonomy of Educational Skills developed by the investigators on a five point scale. The objectives of the study were to study the relative status of Teacher Educators on various skills and their comprehensive profiles on various skills. The Paper presents the relative status of Teacher Educators on various skills and their comprehensive profiles on various skills. The emerging questions are What should be the considerations for the institutionalization of skills? How these skills can be

universalized? All the skills which are acceptable by a democratic State may not be accepted by a totalitarian State? Are there phases in the development of skills, such as, awareness, nascent, competence, internalization and precision & ease in application? Can the various skills be developed simultaneously? Do skills, competencies and styles vary from teacher to teacher? Can the skills be revived? Where will temperament come? How about the development of Listening Speaking Reading Writing Skills across Lexican, Grammar & Phonetics? How to do balancing of skills? How to realize heart & brain healthy entrainment ratio? Which are the facilitating & impeding factors for skill development? Are the skills infinite? Is there skill ultimacy? To what extent Education System can cater to the demands of the Skills? Are the facilities with the teachers available for nurturing all the skills? To what extent the various programs & courses nurture the various skills? How to integrate Taxonomy of Educational Skills in Teacher Education? The Paper concludes that There is an immediate need to integrate Educational Skills.

Scaling Educational Skills

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Every skill for creation, construction, connection, peace & harmony has to be a universal skill. Democratic & totalitarian dichotomy needs to be dissolved to sense & appreciate the skills of the creator. India is a Sovereign, Socialist, Secular and Democratic Republic. These attributes of the Indian State ought to be emulated by every one. Such a State demands, nurtures and deploys all the skills. It is an age of skill, scale and speed in all the domains of life. The skills ought to be universal. The complex conditions of the 21st century demand universal skills in all. The emerging question is- are we really skilled people?

Dhodi Nayana (2011) has developed and implemented a program for Enhancing Info-Savvy Skills in Student Teachers. It demonstrates very well how the info-savvy skills of Asking,

Accessing, Analyzing, Applying and Assessing were developed in the Pre-Service Teachers of India through surfing on Cultural Heritage of India, Buddhist Heritage of India and on the domains of their respective discipline methods. It has been a joyful experience to travel through this research volume experiencing various surfing skills, viz., skimming, scanning, authenticating, hyperlinking, switching, skipping culminating into Educational Immersion for seeking solutions.

Helaiya Sheetal (2010) developed and implemented a Life Skills Program for Student Teachers. The following Life Skills identified by the WHO were considered for the study:

- Self Awareness Skill
- Empathy Skill
- Interpersonal Relationship Skill
- Effective Communication Skill
- Critical Thinking Skill
- Creative Thinking Skill
- Decision Making Skill
- Problem Solving Skill
- Coping with Emotions Skill
- Coping with Stress Skills

An exhaustive attempt was made to differentiate all these Life Skills into various components. Number of Activities were designed, developed and implemented to enhance the Life Skills. The Life Skills Program was implemented on the Pre-Service Teachers during 2008-2009 at the Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, India. Post-intervention scenario on the Life Skills of the Student-Teachers revealed that there was a remarkable gain in their Self Awareness Skill, Effective Communication Skill, Interpersonal Relationship Skill, Coping with Emotions Skill, Decision Making Skill and Problem Solving Skill. There was moderate gain in their coping with stress skill, Empathy Skill, Critical Thinking Skill and Creative Thinking Skill. The most impeding factor in life is that most of us lack Self Awareness Skill, that is, neither we know our strengths, nor do we know our weaknesses. We do not know our goals. As a result we are poor in many other life skills. If we fail to identify with the self, then we fail to identify with others also, that is, we lack empathy skill. Creative Thinking Skill and Critical Thinking Skill, both in one, is a rare combination. We need to learn how to zoom out and zoom in. The complexities of life are increasing day by day. We need to learn how to cope up with the stress and emotions. We need to learn how to be our own selves and equally how to be one with the others. We need to realize healthy constellation through empathy, interpersonal relations and effective communication. We need to make right decisions, timely. Teachers need to possess healthy life skills for development of healthy society. So the Life Skills should be integrated in Teacher Education.

Vaidehi P. Gupta (2013) conducted a Study- Role of ICT for Wholistic Development of the Student Teachers. It is evident from the study that ICT does play its role in wholistic development of Student Teachers. We need to extend the role of ICT for development of all the domains wholistically.

The complexity of the prevailing conditions demands skills for healthy, peaceful, harmonious, full & meaningful living under highly complex socio-cultural-political-economic-demographic conditions. So, there is a need to integrate skills in Education. There are numerous skills which various tasks demand. There is a need to arrive at skill level in all the areas to cope up with the challenges. Education ought to be rational as well as scientific. There is a need to realize Skill

inclusive, Skill integrated, and Skill evolving School Education & Teacher Education at all levels, right from pre-primary to tertiary & continued education. The present paper attempts to evolve a taxonomy of Educational Skills & explore the status of Teacher Educators on various skills.

STATUS OF TEACHER EDUCATORS ON VARIOUS SKILLS

A skill scale was constructed to find out the status of Teacher Educators on various skills by the investigators as follows:

Scale on Educational Skills

Name:

Designation:

email ID:

SNO	SKILL	Very Good	Good	Average	Poor	Very Poor
1	Self Development Skills					
1.1	Monitoring one's own learning needs.					
1.2	Locating appropriate resources.					
1.3	Transferring learning from one domain to another.					
2	SOCIAL SKILLS					
2.1	Interpersonal & Collaborative Skills					
2.1.1	Demonstrating Networking					
2.1.2	Adapting to Varied Roles & Responsibilities					
2.1.3	Working Productively with others					
2.1.4	Exercising Empathy					
2.1.5	Respecting Diverse Perspectives					
2.2.	Communication Skill					
2.2.1	Who (Sender Analysis)					
2.2.2	Says What (Content Analysis)					
2.2.3	To whom(Receiver Analysis)					
2.2.4	Through which channel (Medium Analysis)					
2.2.5	With what Effect (Reach Analysis)					
2.3	Resilience Skill					

2.3.1	Critically sensing the deviant behaviour(s)					
2.3.2	Cause & Effect Analysis					
2.3.3	Marginal Analysis					
2.3.4	Functional Analysis					
2.3.5	Regression Efficiency					
2.4	Social Responsibility Skill					
2.4.1	Acting Responsibly					
2.4.2	Demonstrating Ethical Behavior in Personal Life					
2.4.3	Demonstrating Ethical Behavior in Workplace					
2.4.4	Demonstrating Ethical Behavior in Community					
2.5	Human Relations Skill					
2.5.1	Decency					
2.5.2	Decorum					
2.5.3	Discipline					
2.5.4	Empathy					
2.5.5	Sharing					
2.5.6	Fellow Feeling					
2.5.7	Politeness					
2.5.8	Peace & Harmony					
2.5.9	Healthy Competition					
2.6	Emotional Skills					
2.6.1	Self Awareness					
2.6.2	Self Management					
2.6.3	Social sensitivity					
2.6.4	Social Management					
2.7	Adjustment Skills					
2.7.1	Home Adjustment					
2.7.2	Institute adjustment					
2.7.3	Social Adjustment					
2.7.4	Emotional Adjustment					
2.7.5	Health Adjustment					
2.7.6	Symbiosis					
2.8	Human Development Climate Skills					
2.8.1	Trust					
2.8.2	Risk Taking					
2.8.3	Openness					
2.8.4	Reward					
2.8.5	Responsibility					
2.8.6	Support					
2.8.7	Feedback					
2.8.8	Team Spirit					
2.8.9	Collaboration					
2.9	Citizenship Skills					

2.9.1	Sovereign					
2.9.2	Social Sensitivity					
2.9.3	Learning about community					
2.9.4	Secularity					
2.9.5	Democratic					
2.9.6	Public & Republic					
2.9.7	Leadership					
2.9.8	Management					
2.9.9.	Cooperation & Collaboration					
2.9.10	Participation Skill					
2.10	Accountability & Adaptability Skills					
2.10.1	Personal Responsibility in Personal Context					
2.10.2	Personal Responsibility in Workplace Context					
2.10.3	Personal Responsibility in Community Context					
2.10.4	Setting High Standards					
2.10.5	Meeting High Standards					
3	LIFE SKILLS					
3.1	Self Awareness					
3.2	Empathy					
3.3	Interpersonal Relationship					
3.4	Effective Communication					
3.5	Critical Thinking					
3.6	Creative Thinking					
3.7	Decision Making					
3.8	Problem Solving					
3.9	Coping up with emotions					
3.10	Coping up with Stress					
4	CRITICAL THINKING SKILLS					
4.1	analyzing					
4.2	reflecting					
4.3	weighing Evidence					
4.4	rejecting Alternatives					
4.5	drawing Conclusion					
4.6	rating Results					
4.7	identifying Procedures					
4.8	presenting Arguments					
4.9	self Regulation					
5	REGULATING THINKING SKILLS					
5.1	Impulsive to Booming					
5.2	Non-Pathological to Pathological					
5.3	Invalid to Valid					
5.4	Far to Null					
5.5	Self-centric to Socio-centric					
5.6	Impulsive to Final					
5.7	Artistic to Wholistic					
5.8	Non-sensible to Sensible					

5.9	Additional to Modern					
5.10	Pessimistic to Optimistic					
5.11	Curved to Straight					
5.12	Rigid to Flexible					
5.13	Individual to Social					
5.14	Dependent to Autonomous					
5.15	Narrow to Broad					
5.16	Practical and Theoretical					
5.17	Non-Technical to Technical					
5.18	Non-Logical to Logical					
5.19	Non-Imaginative to Imaginative					
6	RESEARCH SKILLS					
6.1	Skill of identifying problem					
6.2	Developing Conceptual Framework					
6.3	Skill of Reviewing & implication					
6.4	Skill of Research Questioning					
6.5	Developing Rationale					
6.6	Constructing Statement					
6.7	Enunciating Objectives					
6.8	Formulating Hypotheses					
6.9	Operationlization and or Explanation of Terms					
6.10	Deciding Research Type					
6.11	Population & Sampling					
6.12	Specifying Delimitation					
6.13	Constructing/Selecting Tools & Techniques					
6.14	Laying down Data Collection Procedure					
6.15	Working out/ Deciding Data Analysis Techniques					
6.16	Interpreting Analyzed data					
6.17	Formulating Findings					
6.18	Discussion Mechanism					
6.19	Converging into Theses					
6.20	Theory Building					
7	Constructivist Skills					
7.1	Engagement					
7.2	Germination					
7.3	Incubation					
7.4	Innovation					
7.5	Creation					
8	Connectionist Skills					
8.1	Interpretation of units					
8.2	Activation of the network of units					
8.3	Learning Algorithm					
8.4	Recurrent Neural Networking					
8.5	Evolving continuous, dynamic systems approaches					
9	Systems Thinking Skills					
9.1	Cognizing all the parameters					
9.2	Establishing interrelation & interdependence					

9.3	Realizing Integrated Whole					
9.4	Ensuring Efficiency					
9.5	Ensuring Cost Effectiveness					
10	Info-Savvy Skills					
10.1	Asking					
10.2	Accessing					
10.3	Analyzing					
10.4	Applying					
10.5	Assessing					
11	Techno-Pedagogic Skills					
11.1	Media-Message Compatibility					
11.2	Media Designing					
11.3	Integration of message, media and modes					
11.4	Proximity of Message Forms					
11.5	Media Language Proficiency					
11.6	Media Choice					
11.7	Media Credibility & Message Authenticity					
12	Digital Age Skills					
12.1	Functional Literacy skills					
12.2	Scientific Literacy skills					
12.3	Technological Literacy skills					
12.4	Information Literacy skills					
12.5	Cultural Literacy skills					
12.6	Global Awareness skills					
13	Open Education Resourcing					
13.1	Learning-Content (geogebra, google earth)					
13.2	Creativity (hot potato, C map)					
13.3	Evaluation (R-campus & Mahara)					
13.4	Learning Management System (Moodle & Wiki spaces)					
13.5	Teacher-Managed Communication Platforms (Classroom 2.0 & Web Quest)					
13.6	Statistical Tools for data processing					
13.7	e-Journals					
13.8	e-books					
13.9	e-News Letters					
13.10	Webinars & Web Conferencing					
13.11	WBI					
14	Creative Leadership Skills					
14.1	ocio-centric rather than ego driven					
14.2	empowers the people to make decisions rather than take decisions					
14.3	listen oriented than tell oriented					
14.4	Aligns the organization towards a vision					
14.5	Relies on intuition					
14.6	Generates lasting commitment					
14.7	Open minded than opinionated					
14.8	Places importance of self responsibility					

	rather than teaches subordinates to take directions					
14.9	models self responsibility rather than in a self protect mode					
14.10	flows, relaxing control yields results rather than is afraid of losing control					
14.11	focuses on building on strengths rather than finding & fixing problems					
14.12	teaches how to learn from mistakes rather than quick to fire those that fail.					
15	Administration Skills					
15.1	Planning					
15.2	Organizing					
15.3	Staffing					
15.4	Coordinating					
15.5	Budgeting					
16	TIME MANAGEMENT					
16.2	Spacing Things Out; Do not procrastinate					
16.3	Using Social Time Wisely					
16.4	Prioritizing and Reprioritizing constantly					
16.5	Keeping your health/sleep/exercise in check					
17	Spiritual Development Skills					
17.1	Religiosity					
17.2	Knowledge of the soul					
17.3	Quest for life values					
17.4	Conviction, Commitment & Character					
17.5	Happiness & Distress					
17.6	Brotherhood					
17.7	Equality					
17.8	Acceptance & Empathy					
17.9	Love & Compassion					
17.10	Flexibility					
17.11	Leadership in Educational Change					
18	YOGA Skills					
18.1	Yama or Eternal Vows: Ahimsa, Satya, Asteya, Aprigraha & Brahmacharya					
18.2	Niyama or Observances: Saucha, Santosha, Tapas, Savdhya, Ishvarapranidhana					
18.3	Asana: Firm, Comfortable Meditative Posture					
18.4	Pranayama: Regulation of the Vital Force					
18.5	Pratyahara					
18.6	Dharna					

18.7	Dhyana					
18.8	Samadhi					
19	Wholistic Development Skills					
19.1	Cognitive					
19.2	Affective					
19.3	Psychomotor					
19.4	Physical Health					
19.5	Spiritual					

Rationale of the Study

Educational Skills emerge scientifically through problem specific theorization, instantaneously. Now the question is have various skills been integrated in Teacher Education scientifically & comprehensively. 21st century conditions demand skills for healthy, peaceful, harmonious, meaningful and full living under highly complex socio-cultural-political-economic-demographic and environmental conditions. Skill is the Science applied artistically or art applied scientifically, precisely, easily, joyfully, cost effectively. It demands perfect, instantaneous coordination of mind and motor muscles patiently & passionately. Education ought to be science based, skill based and technology integrated. The present paper attempts to explore the status of Teacher Educators on various skills.

Objectives of the Study

1. To study the relative status of Teacher Educators on various skills.
2. To study the comprehensive profile of Teacher Educators on various skills.

Sample for the study

Sample for the study is constituted of 18 Teacher Educators of the School of Science & Education, Navrachana University, Vadodara, Gujarat, India (2015-16).

Tools & Techniques Employed

A Self Tracker on Taxonomy of Educational Skills was constructed by the investigators as presented above. Also FGD was conducted with the Teacher Educators post-administration of the Skill Tracker.

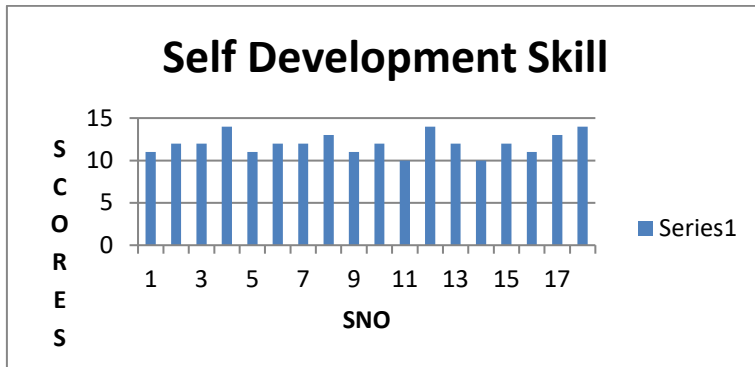
Data Collection

The Skill Tracker was administered on the 18 Teacher Educators. They registered their responses against a five point scale. It was followed by the FGD.

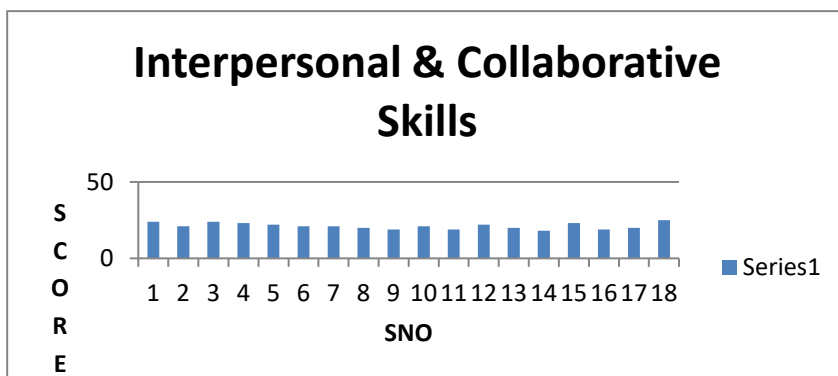
Data Analysis

The data were analyzed in terms of frequencies, skill-wise and over all. Data analysis is presented as follows:

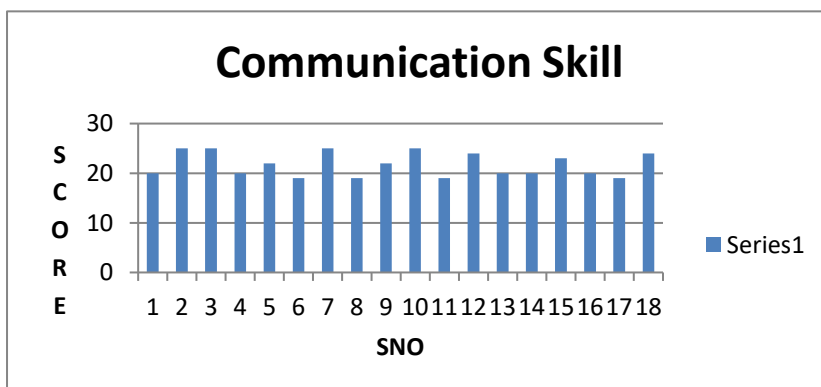
Relative Status of the Teacher Educators on various Skills



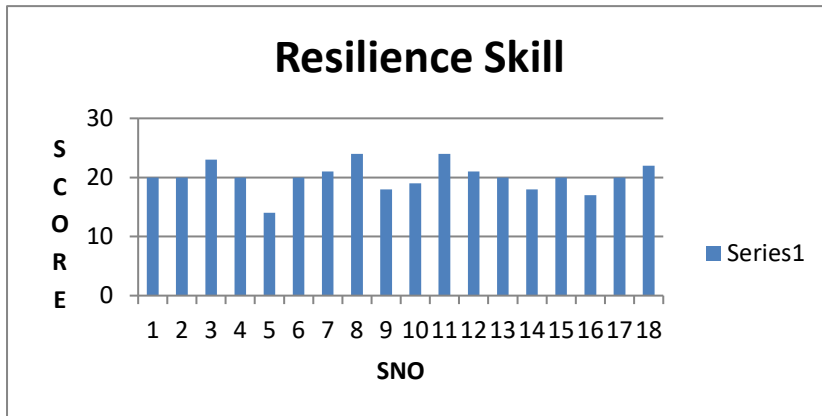
The maximum score obtained on Self Development Skills is 14 out of 15, whereas, minimum score obtained is 10, whereas, the mean score is 12.



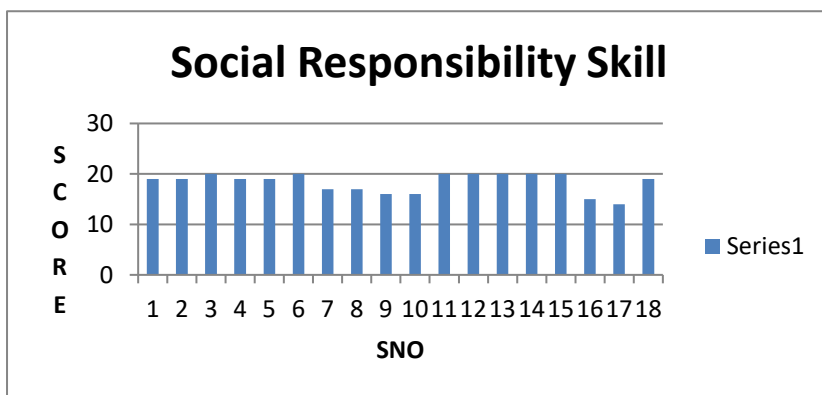
The maximum score obtained on Interpersonal & Collaborative Skills is 25 out of 25, whereas, minimum score obtained is 18, whereas, the mean score is 21.22.



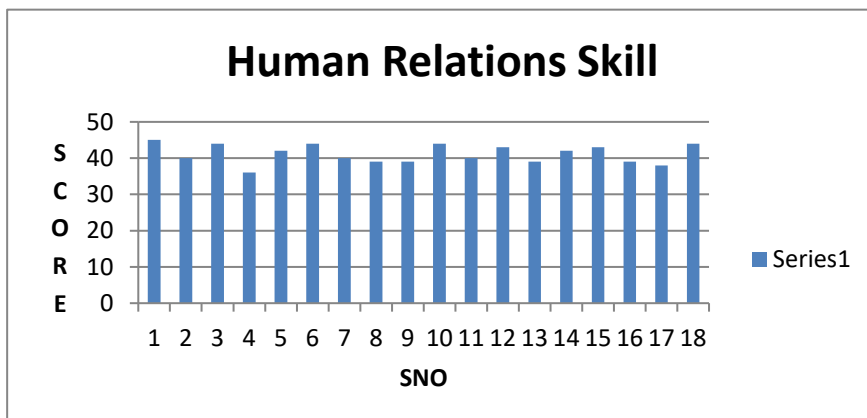
The maximum score obtained on Communication Skills is 25 out of 25, whereas, minimum score obtained is 19. The mean score is 21.72.



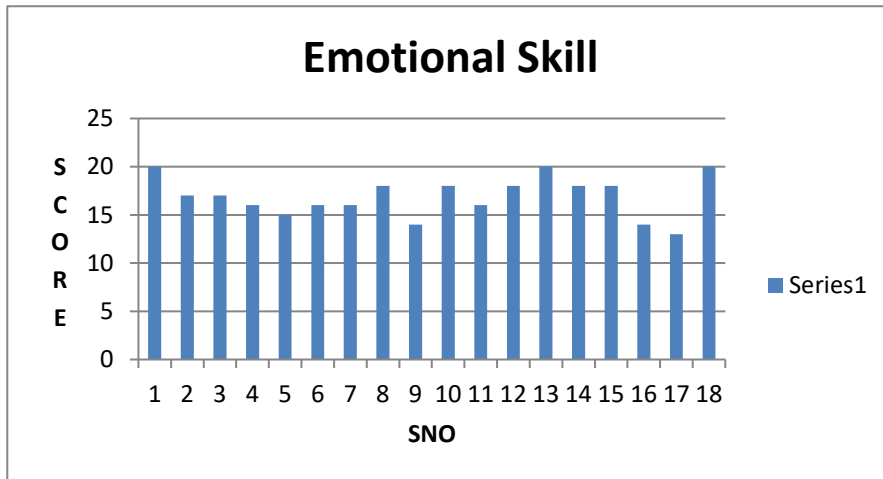
The maximum score obtained on Resilience Skill is 24 out of 25, whereas, minimum score obtained is 19. The mean score is 20.05.



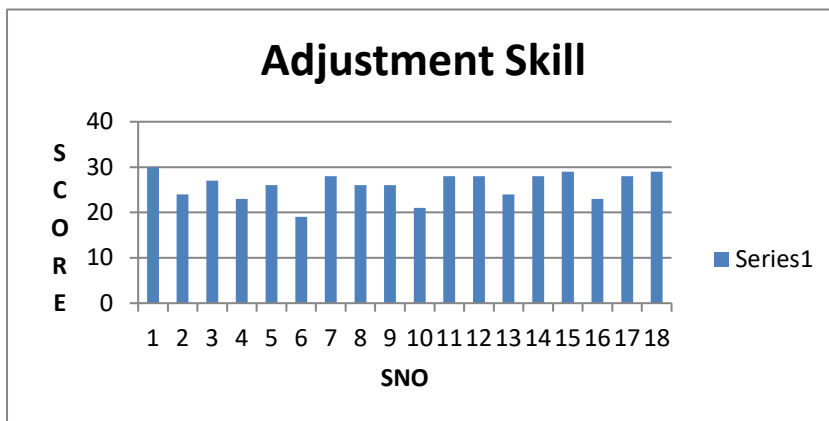
The maximum score obtained on Social Responsibility Skills is 20 out of 20, whereas, minimum score obtained is 14. The the mean score is 18.33.



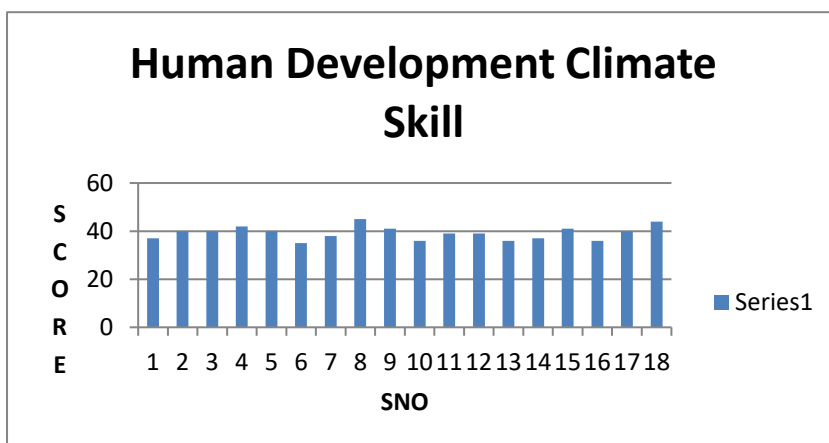
The maximum score obtained on Human Relations Skills is 45 out of 45, whereas, minimum score obtained is 36. The mean score is 41.17.



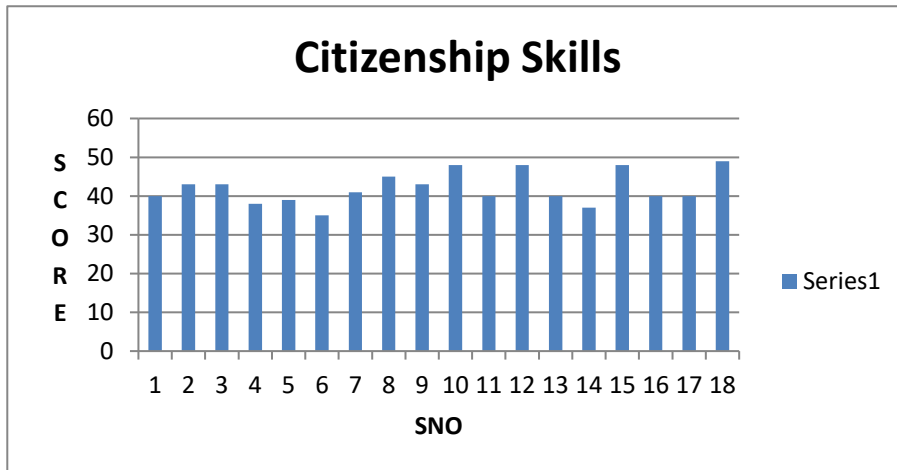
The maximum score obtained on Emotional Skills is 20 out of 20, whereas, minimum score obtained is 13. The mean score is 16.89.



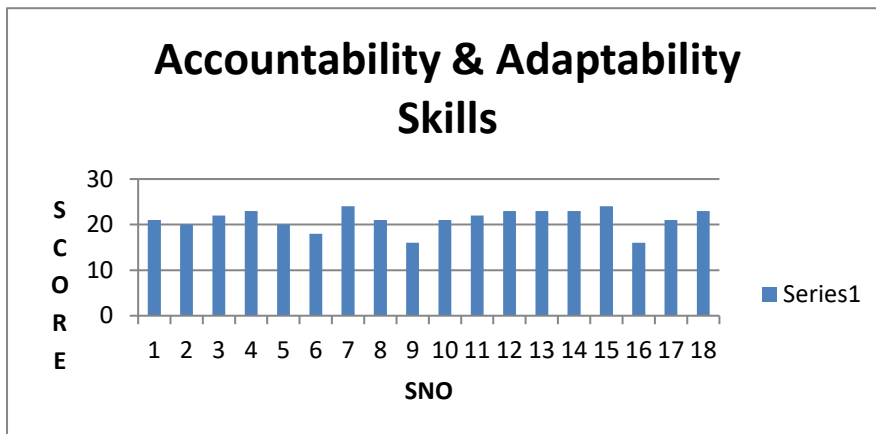
The maximum score obtained on Adjustment Skills is 30 out of 30, whereas, minimum score obtained is 19. The mean score is 25.94.



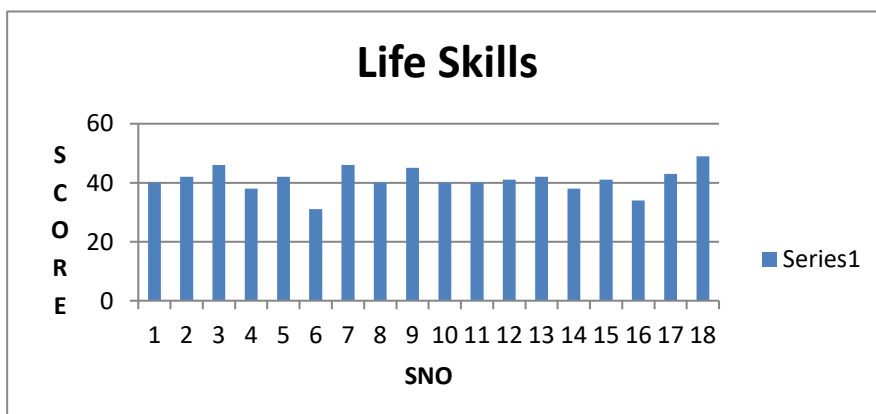
The maximum score obtained on Human Development Climate Skills is 45 out of 45, whereas, minimum score obtained is 35. The mean score is 39.22.



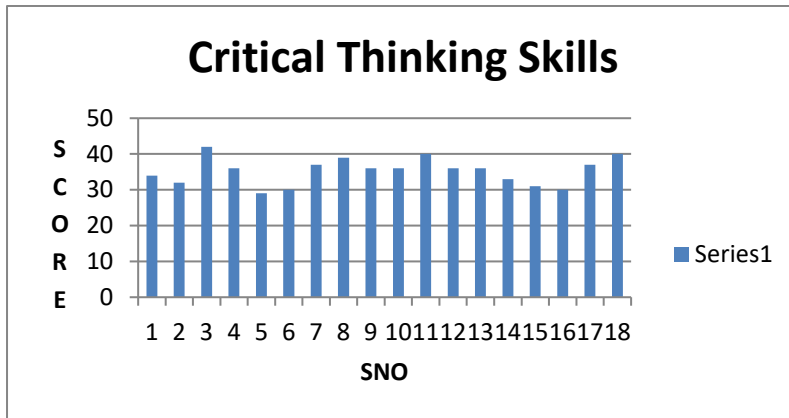
The maximum score obtained on Citizenship Skills is 49 out of 50, whereas, minimum score obtained is 35. The mean score is 42.06.



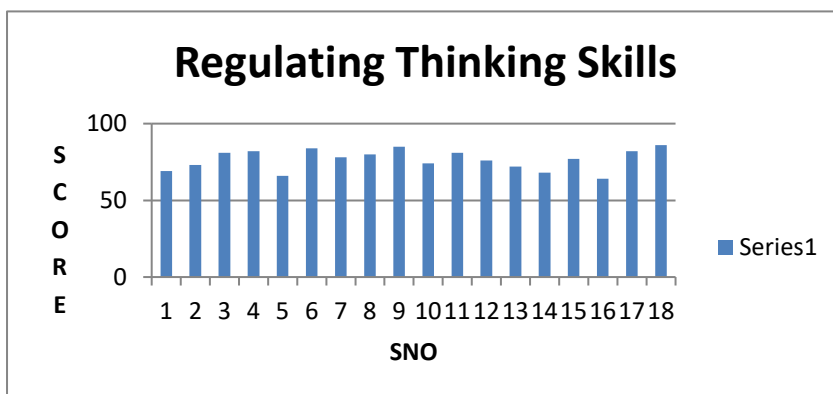
The maximum score obtained on Accountability & Adaptability Skills is 24 out of 25, whereas, minimum score obtained is 16. The mean score is 21.17.



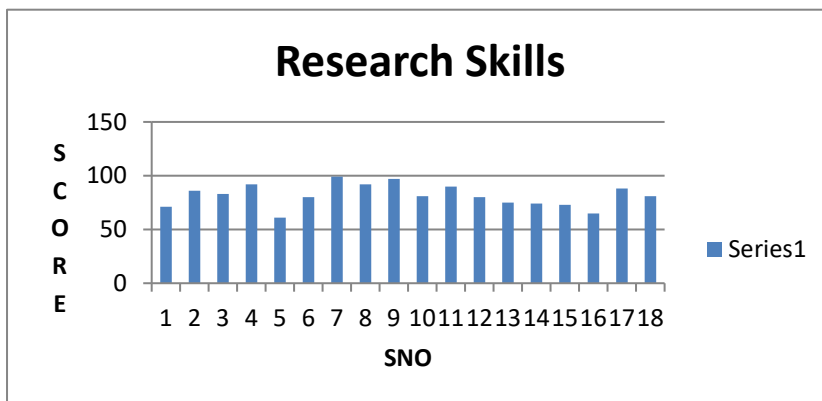
The maximum score obtained on Life Skills is 49 out of 50, whereas, minimum score obtained is 31. The mean score is 41.



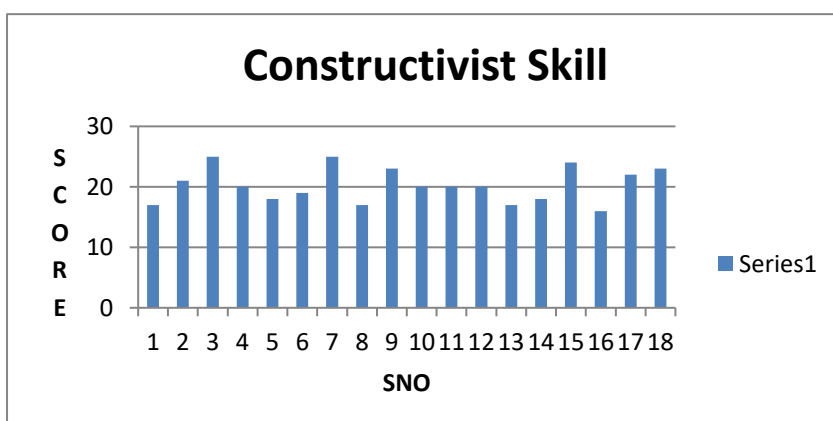
The maximum score obtained on Critical Thinking Skills is 42 out of 45, whereas, minimum score obtained is 29. The mean score is 35.22.



The maximum score obtained on Regulating Thinking Skills is 86 out of 95, whereas, minimum score obtained is 64. The mean score is 76.56.

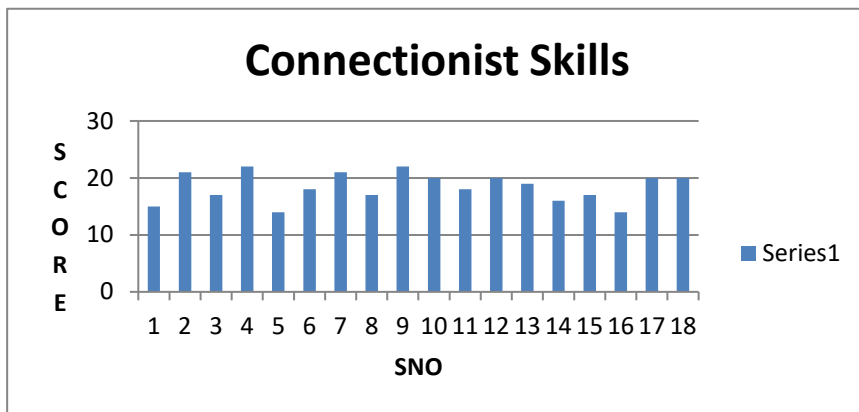


The maximum score obtained on Research Skills is 99 out of 100, whereas, minimum score obtained is 61. The mean score is 81.56.

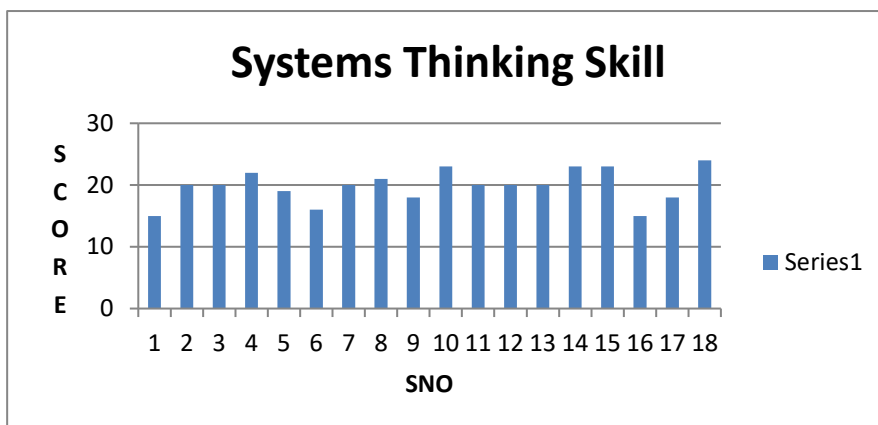


The maximum score obtained on Constructivist Skills is 25 out of 25, whereas, minimum score obtained

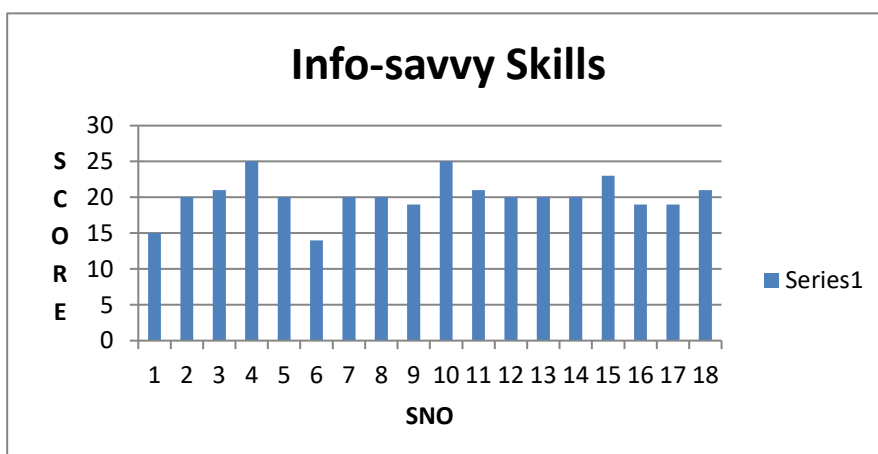
is 16. The mean score is 20.28.



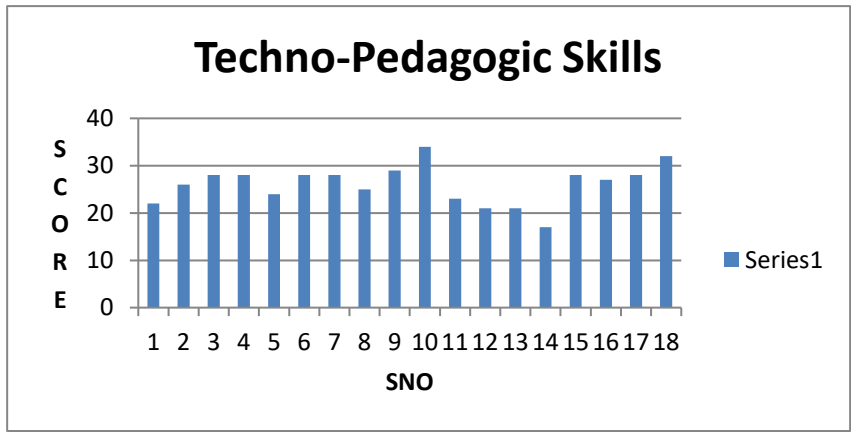
The maximum score obtained on Connectivist Skills is 22 out of 25, whereas, minimum score obtained is 14. The mean score is 18.39.



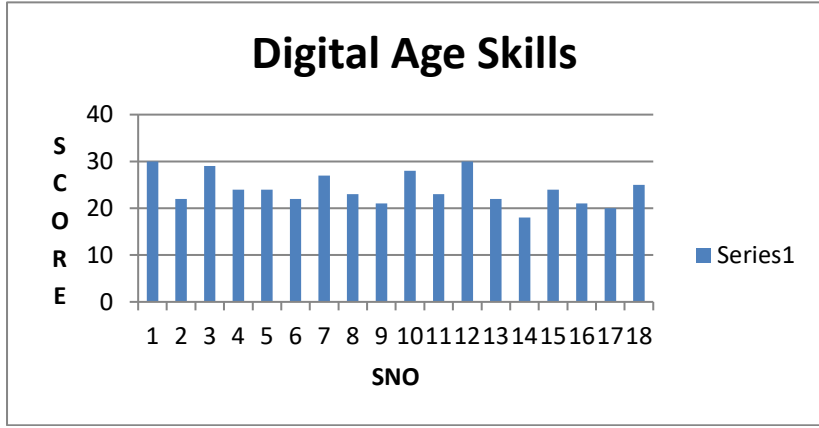
The maximum score obtained on Systems Thinking Skills is 24 out of 25, whereas, minimum score obtained is 15. The mean score is 19.83.



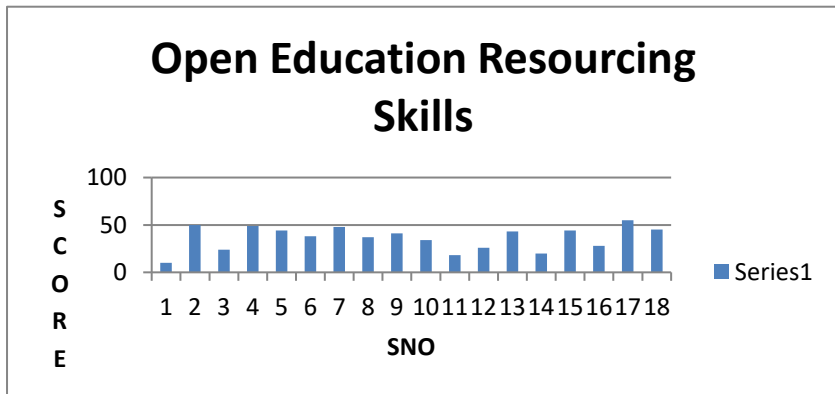
The maximum score obtained on Info-savvy Skills is 25 out of 25, whereas, minimum score obtained is 14. The mean score is 20.11.



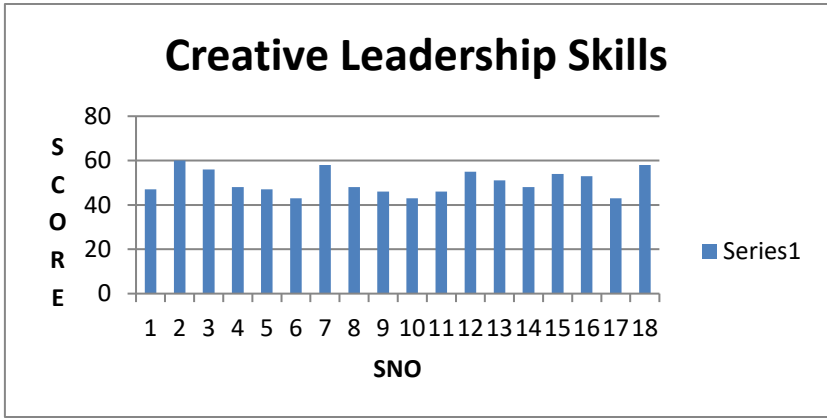
The maximum score obtained on Techno-Pedagogic Skills is 34 out of 35, whereas, minimum score obtained is 17. The mean score is 26.06.



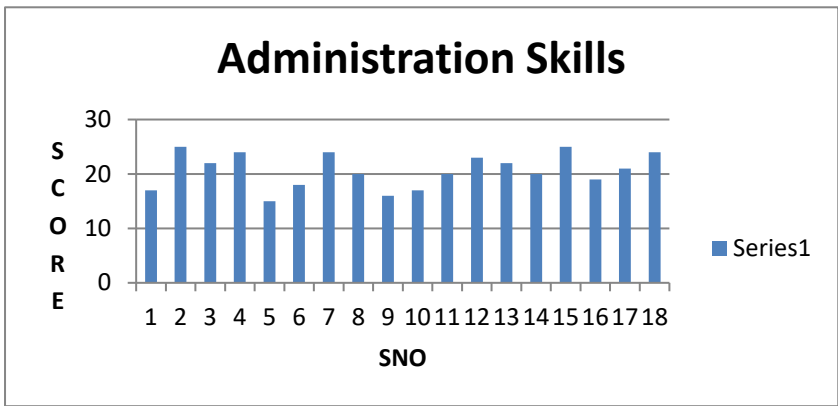
The maximum score obtained on Digital Age Skills is 30 out of 30, whereas, minimum score obtained is 18. The mean score is 24.06.



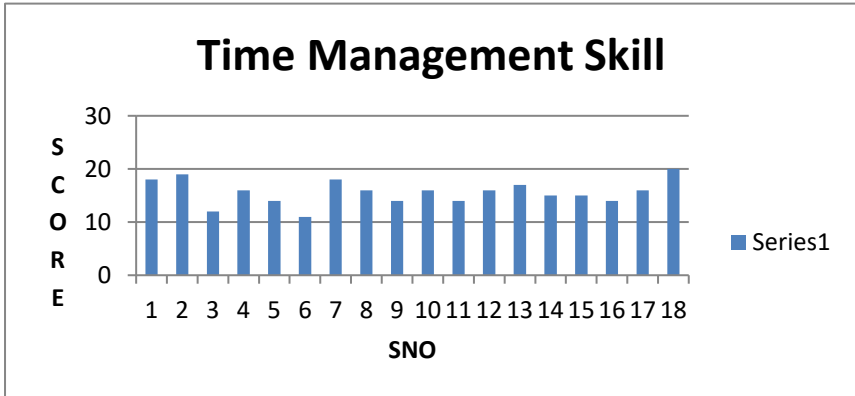
The maximum score obtained on Open Education Resourcing Skills is 55 out of 55, whereas, minimum score obtained is 10. The mean score is 36.33.



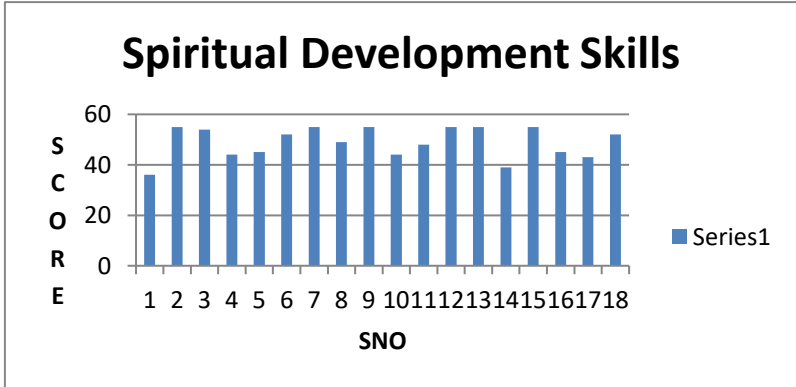
The maximum score obtained on Creative Leadership Skills is 60 out of 60, whereas, minimum score obtained is 42. The mean score is 50.22.



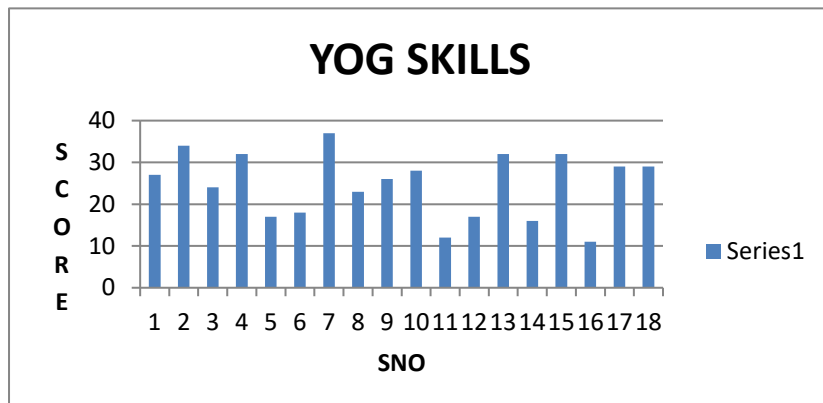
The maximum score obtained on Administration Skills is 25 out of 25, whereas, minimum score obtained is 15. The mean score is 20.67.



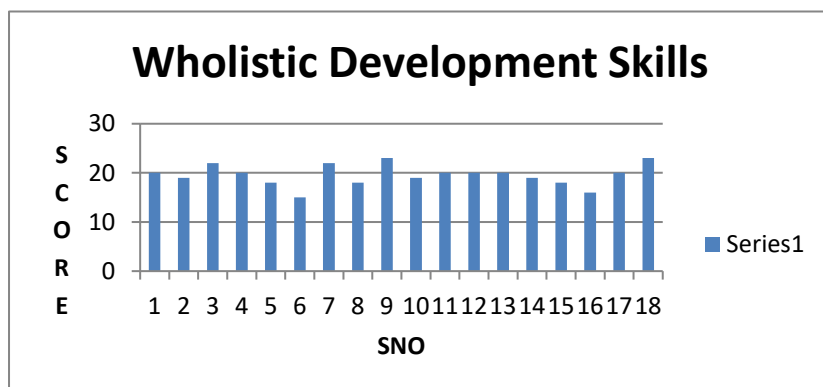
The maximum score obtained on Time Management Skills is 20 out of 20, whereas, minimum score obtained is 11. The mean score is 15.62.



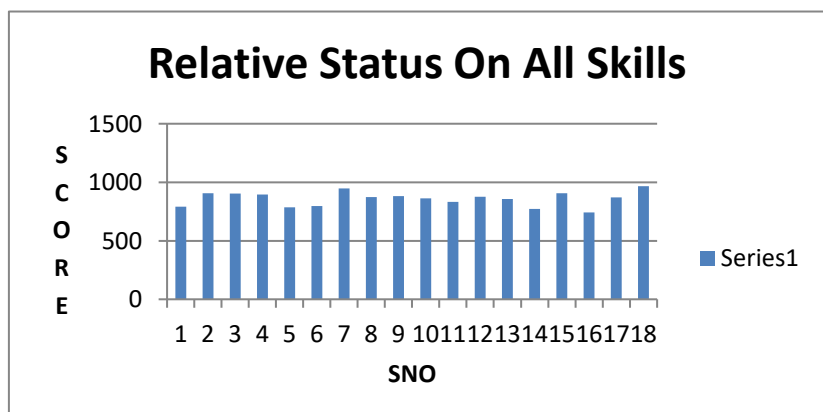
The maximum score obtained on Spiritual Development Skills is 55 out of 55, whereas, minimum score obtained is 36. The mean score is 48.94.



The maximum score obtained on Yog Skills is 37 out of 40, whereas, minimum score obtained is 11. The mean score is 24.67.



The maximum score obtained on Wholistic Development Skills is 23 out of 25, whereas, minimum score obtained is 15. The mean score is 19.56.



The maximum score obtained on the Skills as a Whole is 965 out of 1060, whereas, minimum score obtained is 741. The mean score is 858.83.

Emerging Questions through FGD

- What should be the considerations for the institutionalization of skills?
- How these skills can be universalized?
- All the skills which are acceptable by a democratic State may not be accepted by a totalitarian State?
- Are there phases in the development of skills, such as, awareness, nascent, competence, internalization and precision & ease in application?
- Can the various skills be developed simultaneously?
- How to develop info-savvy skills?
- Do skills, competencies and styles vary from teacher to teacher?
- Can the skills be revived?
- Where will temperament come?
- How about the development of Listening Speaking Reading Writing Skills across Lexican, Grammar & Phonetics?
- How to do balancing of skills?
- How to realize heart & brain healthy entrainment ratio?
- Which are the facilitating & impeding factors for skill development?
- Are the skills infinite?
- Is there skill ultimacy?
- To what extent Education System can cater to the demands of the Skills?
- Are the facilities with the teachers available for nurturing all the skills?
- To what extent the various programs & courses nurture the various skills?
- Why there is added focus on skills in 21st Century than on knowledge?
- How to reduce anger, stress & strain?
- How to live full, meaningful, healthy, hilarious and resonating life?
- How to integrate Taxonomy of Educational Skills in Teacher Education?

Concluding Remarks

The complexities of the living conditions demand skillful persons in various dimensions of life. All the skills have their own significance. Info-Savvy & Digital Skills are as important as Spiritual Intelligence and Yoga Skills. Self Awareness Skills are as important as Systems Thinking Skills. Production Skills are as important as Consumption Skills. Zooming out is as important as Zooming in. Personal Skills are as significant as Citizenship Skills. General as well as Special Skills have their own value. Research is as important as Construction. Downloading is as important as uploading. How can life be a network of arrays of innumerable skills, where, ideas spring, feelings flow, motor creates, spirit reins, and the self resonates with the sphere in this digital age? Dancing crops, flowing wisdom, enchanting music, touching songs, resonating dance, immersing verses, speaking sculptures, enlightened learners, innovative researchers, skillful scholars and creative constructors are the wonderful springs of nature.

India ought to have skill, scale & speed to realize sustainable development. We need to be proficient on hard skills & soft skills, Science Process Skills & Digital Age Skills, Research Skills & Constructivist Skills, Laboratory Skills & Connectionist Skills, Self Direction Skills & Social Development Skills, Digital Age Skills & Spiritual Development Skills, Cognitive Skills & Emotional Development Skills, Micro-Specialist Skills & Wholistic Development Skills, Time-Space-Personnel Management Skills & Spiritual Development Skills, Production Skills and Marketing Skills, Human Development Skills & Universal Becoming Skills, Production-cum- Consumption Skills, Downloading Skills & Uploading Skills, becoming skills & debecoming skills, and above all Skills for living and leading full meaningful, happy & healthy life. There has to be added focus on Healthy Relationship Skills realizing trust, transparency, cleanliness, honesty, patience, tolerance, truthfulness, compassion, forbearance, respect, controlling emotions and expression. Also we need to observe decency, decorum, discipline in every meeting by

viewing wisely, listening deeply and speaking analytically and critically, also, agreeing to disagree at times

The scope of skills is infinite. The skills ought to be universal. There ought not to be any disclaim or disclaimer. When will we learn to adore the biosphere which is full of life, energy and wonderful skills? When will the Teacher Education rise above the ritual of microteaching and Teach us the wholistic skills, the balancing skills, the resonating skills, the immersion skills, the production skills, the consumption skills, the presumption skills, the transcendence skills, the life skills? There is an immediate need to integrate Educational Skills.

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