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Why “Education India”

Padam Shri Prof. M.S. Sodha¹

Speed in communication is essential for significant impact of research in education; this is particularly true of action-oriented research. It can result in urgent action when most needed, new initiatives and almost online evaluation of ongoing implementation of policies. It is essential for having a studied response to proposed initiatives, so that these may be modified or abandoned, before it is too late to contain the damage; it may also assist in modifying a concept for maximum effectiveness. Even the factual basis for a step can be challenged by a scholarly approach.

We feel that an electronics journal best serves the purpose. Fresh ideas based on original thinking or adaptation of experience anywhere, a critical evaluation of the existing policies/practices, a philosophical even factual basis for action or midcourse correction and quick awareness cum analysis of the present scenario are some of the benefits, which are obviously inherent in an e-journal like “Education India”.

Research also benefits from the quick communication, inherent in an e-journal. Dialogue was the ancient form of research, where a few scholars, limited by geographical considerations, engaged to discuss an important issue and arrive at a consensus or agree to differ. With the advent of printing, this practice, despite frequent conferences/seminars got diluted, mainly because there are few papers of interest to an individual and there is little time to think and discuss the subject. The e-journal offers an opportunity for significant research by the dialogue mode with large participation and presentation of views after great deal of thought and scrutiny by the reviewer.

By offering this free access journal with copyright to the authors and without publication charges we have taken out the economic sting in research and enlarged the readership at the same time. We do not have any objection to the publication of the papers elsewhere.

A unique feature of the present journal is the opportunity to update the paper by comments of the readers and the authors’ reply. The authors also have an opportunity to substitute their original paper by an updated version.

¹ Former Vice-Chancellor Indore, Lucknow & Bhopal Universities, Former Deputy Director IIT-Delhi.
Another notable feature is the extension of the scope from “higher secondary” to “pre primary to post doctoral studies”. Management and planning aspects of education will also receive the much needed impetus.

We welcome suggestions from readers on enhancing the standard, scope and usefulness of the journal.

Welcome to the eternal and exciting pilgrimage from the unknown to known.

*****************************************************************************
Higher Education in India: Emerging Scenario

Prof. D.R. Goel²

& Dr. Chhaya Goel³

Abstract

Higher Education in India will be governed more by neo-liberalism, neo-capitalism and neo-colonialism. The increase in the demand of higher education be it liberal or technical will be unmanageably large, rapid and pressing. India will need significantly greater number of universities to attain gross enrollment ratio of at least 12-15%. Public and private dichotomy will continue to be there in the higher education. The governance & administration of Higher Education will have to be based on Scientific, Democratic, Humanistic principals. CBCS will be largely implemented in higher education. There will be a significant shift from F2F to e-mode to distance mode. Apex agencies will be still lost in the dual mode of granting & monitoring. Higher Education will continue to be governed by bureaucratic, conservative, hierarchical, traditional model. The problems of sharing of resources, inter-disciplines and trans-disciplines will have to be resolved. Higher Education will need more of de-centralization, innovation, creation and construction. Academic Performance Indicators will have to be worked out more scientifically and comprehensively. Learning from the profiles of Nalanda & Takshila the culture of Higher Education will have to be revived. We will have to do away with ritual convocations which are without real invocations. The top academic administrators of Higher Education will have to be interdisciplinary experts having rich profiles and balanced personalities. The Professors will profess to the levels to shake any unconstitutional, unlawful, unethical and wrong administration. The support staff will be real extension of scholarship to guard Higher Education. Higher Education rather than stretching hands for grants will generate corpus of funds through its own production and patents. Higher Education will have to revive its identity. Art without perspective, Commerce without substance, Science without ethics and Administration without sensibilities and sensitivities are meaningless. Erecting tall buildings, with the foundation stones laid down by the tall, and pumping in

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huge public exchequer do not ensure Higher Education. The tertiary Education has to be innovative, creative & constructive to sustain its identity as higher every moment, be it liberal or technical. With all ifs and buts, the Indian Higher Education will continue to be higher and keep serving the universe with all dedication, addressing innumerable problems. New Age Institutions will be created and old age renewed for continuous updating of knowledge and skills. There will be phantom use of resources. Symbiosis, peace & harmony, health & hygiene, production & Marketing, Scholarship & Exchange, indigenous creation & trans-creation, research & construction will be the salient features of Higher Education.

Philosophies Governing Higher Education:

Indian higher education is being governed by neo-liberalism, neo-capitalism, and neo-colonialism and vice-versa. Those who have power to purchase higher education of any kind, from anywhere, at any time can purchase it. These producers and consumers have liberal, borderless, global markets. But, do we get what we want from higher education? We are used to food of our choice, our taste, our suitability, anywhere, anytime, any condition. Now, why are we trying to bring in fast food, fast information, cafes, expecting the consumers to change their tastes as per the tastes of the producers. Fast food, though, provides us more of choice and a variety of strange taste, but, it bewitches neither the body, nor the mind, forget about the spirit. Higher Education, which perceptually is the regime of these neo-isms is the regime of none of these. We need to revive our values and ethos. It is only inculcation of values and sensitivity to the basic culture, which can help us.

Increasing Demand and Dilution:

The increase in the demand for Higher Education, be it liberal or technical has been unmanageably large, rapid and pressing. Particularly, Law, Commerce, Engineering and Education Faculties are over loaded. Higher Education is at the cost of the innocent public, which is investing with high hopes, but, little returns. There are problems of transition from +2 stage to higher education institutions. We have blind floods in higher education, neither knowing their origin nor destination. There are gaps between the academic attitude and academic aptitude of sizeable students enrolled in higher education. There are gaps between the teaching attitude and teaching aptitude of sizeable teachers employed for higher education. There are imbalances in student &
teacher strength in various streams and programs. We have market oriented higher education be it admission, instruction or placement. There is competition, fair or foul.

**Higher Education Identity:**

At present there are 342 universities and university-level institutions in India including 18 Central Universities, 211 State Universities, 95 Deemed Universities, 5 institutions established under State Act and 13 institutes of national importance apart from around 17,000 colleges including 1800 women colleges in India. Of these, 40 universities/Institutions provide higher education in agriculture (including forestry, dairy, fisheries and veterinary science), 25 in medicine (including Ayurveda, Homoeopathy, Pharmacy, Dental, etc.), 49 in engineering and technology, 07 in Information and Communication Technology and 08 in law. The number of Open Universities is 11 and that of Women Universities is 06. The total enrolment of students in universities and colleges is 99.54 lakh while the number of teachers is 4.5 lakh. Only seven percent of the population in the 18-24 age group has access to higher education. India will need 1,500 universities to attain gross enrolment ratio of at least 15 per cent by 2015. This is a key observation made by the National Knowledge Commission (NKC) in its note to the Prime Minister on higher education.

Stating that opportunities for higher education “are simply not enough in relation to our needs,” the NKC has called for a massive expansion of opportunities.

**Higher Education: Maintenance & Expansion:**

There is a problem of maintenance and expansion of higher education. A large number of institutes of higher education have constituted a variety of committees, such as, Admission Committee, Work Load Committee, Fee Committee, Selection Committee, Salary Committee. Inspite of all efforts by the institutes of higher education, there are innumerous problems, such as, follows:

- A large number of State Universities are under staffed.
- The teaching staff positions are sanctioned by the Central Government, but very often there is no State concurrence.
• There is abrupt cut on the teaching and non-teaching staff positions by the States.

• Staff salary on Paper is different and in actuality is different, more so, in case of a sizeable institutions run by a large number of private trusts.

• There is degeneration of a sizeable number of higher education institutions in terms of various parameters- input, process, throughput, and output.

• There are demand and supply in-equations.

There are problems of all levels of maintenance-preventive, corrective, adaptive and perfective. We have significantly lesser number of higher education institutions than what we need. Establish six more IIT. Open ‘n’ more IIM. Establish 1000 more universities. All excellent recommendations by the Committees and Commissions. But, how to? Professors cannot be produced over overnight. Merely pumping money, bestowing grants and laying foundation stones do not ensure suitable infrastructure. Expansion of higher Education is beyond the limited data bases and faculties of Committees and Commissions, it demands a countrywide debate and discussion.

**Higher Education: Public & Private:**

The public and private dichotomy is a continuous phenomenon in higher education. A large number of existing institutions have inadequate infrastructure and educational competence to bear Higher Education. Neither we have been in a position to sustain liberal arts nor develop science and technology. The product which gets the license from the institutes of Higher Education is rarely their product. This is largely the product of off-campus sector which operates in many varied ways. Higher Education day by day is being governed by the private sector, which has more of commercial motive than educational. Higher Education has been made commodity and commerce. How to realize excellence, equity and equality at the same time?

**Higher Education: General & Honours:**

Honours at Bachelor’s level is an anti-thesis to inter-disciplinarity. Graduates without sound knowledge base at a tender age try to be micro-specialists having little understanding of the whole. As a result, they are neither fit for self nor field. It is high time that the nation does away with honours at
under-graduate level. Specialization should emerge from the field even at Post-Graduate level. The Generalist & Micro-Specialist dichotomy is very difficult to resolve.

Choice Based Credit System:

In syllabus, on paper, we offer a large number of optional areas, whereas, in practice, a few. It is a countrywide phenomenon. In fact, there is little choice or no choice. Where is the option? What is wrong with our educational system? It is attributed to limited faculty, diverse courses, and scarcity of resources. But, more than the question of resources it is a question of resourcefulness. If the institutes of higher education do not modernize themselves, then there is every possibility of their going defunct. Choice Based Credit System at the face of it increases the work load of the teaching faculty significantly, particularly, classical F2F faculty. Wider the choice more are the demands on the education system. CBCS demands multiple modes of instruction through expert sources and systems, namely, modular mode, e-mode, synchronous, as well as, asynchronous modes, educational sourcing in addition to traditional formal instruction. Similarly, the evaluation is through electronic evaluation rubrics, continuous, internal, on line, on demand, in addition to paper-pen, activity based and practicum based.

Staff & Student attendance an alarming issue:

Observation of process norms ensures quantum and quality yield. Surprisingly, though, the teaching faculty and students are present on campus, but, some of them do not class. What to label this phenomenon? Present Absent. On the contrary, in some of the faculties, there is very little presence. There are off campus classes by the private sector. The question is, when 80-85% attendance is compulsory, then, without completion of attendance how these students are permitted to appear at end examination? How about their continuous, comprehensive internal evaluation? Still serious issue is professional ethics. More serious are the problems with distance education & open education programs.

Apex Agencies lost in the dual Roles:

A large number of apex agencies, namely, UGC, AICTE, NCTE, NAAC, BCI, MCI, ICAR have come up during the past. Of all these agencies, the NCTE has been questioned most, to the extent, that at one point of time the
nation thought of dissolving it. But, that too, perhaps was not found to be the resolve. UGC, being, both, the Grants Commission & Higher Education Monitoring Agency has been trying its level best. NAAC has taken up the task of observing quality and relevance of higher education. It is functioning relatively better. But, the higher education institutions try to show off what they are not. In between recognition and accreditation, the process of higher education is lost somewhere. In this context the efforts of the NAAC are appreciable in working out the Key Areas, Quality Aspects, & Quality Indicators, particularly, for Assessment and Accreditation of Teacher Education Programs. Engineering, Law, Medicine, almost, all the disciplines need to be regulated. What should these agencies do, so that, the respective institutions and their products have professional feel and appeal? How to excel, exhilarate and enthuse higher educators & institutions?

**In breeding in Higher Education:**

There is lot of inbreeding, that is, regionalism and provincialism in higher education. Some of the States insist on State domicile for admissions into the programs. In addition to this the services rendered by the teaching staff in the other States do not count towards the service benefits. As a result the higher education is administered by a mono-culture, largely, by mediocre.

**Reservation not Remediation:**

We have sizeable reservation (>50%) in higher education. In this age of equity, equality and democracy, it is highly desirable. But, along with this, what is absent is, thorough remediation.

**Inadequate Autonomy, Flexibility & Transparency:**

Higher Education institutions have only a little autonomy, flexibility and transparency, which is too meek to nurture higher education. Higher Education is being governed by bureaucratic, conservative, hierarchical, traditional model rather than by human relations model.

**Higher Education: Input, Process & Output:**

We have little control on the Inputs and Processes of higher education. So, the relevance and quality of the product of higher education cannot be forecasted and achieved deterministically. Process norms are grossly neglected. There is more focus on exposition and instruction, rather than creation and
construction. Higher Education has become more theoretical than practical. There are wide gaps between vision and mission. There are wide gaps amongst educational objectives, curricula, modes of transaction, and evaluation. There is progressive dilution from objectives to evaluation.

**Problems of Sharing of Resources, Inter-disciplines & Trans-Disciplines:**

There is a little networking amongst the agencies and institutions of higher education. Exchange and sharing of resources is very rare. A few consortiums here and there are more for demonstrations, than fully functional. There are rare repositories of learning resources. There are boundaries and seasoned gate keepers amongst disciplines. People from various disciplines rarely sit around the table.

There is a need to share credits intra-university and inter-university. Also, there should be provision for Credit Transfer, Student Mobility and Mutual Recognition. Most of the Higher Education Institutions are working more or less in isolation. There is a need of sharing resources and courses within institutions, between conventional and conventional universities, Open and open universities, and conventional and open universities.

**Centralized Higher Education:**

Most of the Universities in India are affiliating universities. The affiliated colleges go by the curricula, modes of transaction and evaluation designed by the Universities. They have little autonomy, because a large majority of them are not properly equipped for offering Post-Graduate Programs. Being economically affluent and politically powerful does not ensure the higher education credibility of a private trust. The Post-Graduate product of a large number of these trusts has little insight into the national problems and developmental challenges. Research has become a ritual. As a whole the quality of higher education suffers. Should the PG programs be delimited to Universities and autonomous institutions, only? Or else could each and every institute of higher education be resourceful, powerful, and autonomous?

**Innovative Higher Education:**

Inspite of the repeated focus on semester based credit system, still annual and marking system is prevalent in most of the institutions of higher education. Choice Based Credit System is offered by the rare institutions. Continuous
internal evaluation is the feature of rare institutions. Still there is a primitive culture of flying Squads in Higher Education Examination. Even in this age of Technology in Education, Electronic Distribution of Examination Papers is done by only a few institutions. Very often the Innovative Programs proposed by the efforts of some Institutions are declared to be not under the purview of the apex agencies in the respective areas, because, the so called expert committees fail to appreciate these programs. The apex agencies need to be additionally careful while constituting the Expert Committees for the Innovative Programs.

**Research at Higher Education:**

Research at higher education level has been carrying out more of analytical, descriptive and evaluative functions than advisory and inventive. We are more in the realm of description rather than prediction and control. Massive Action Research, Applied Research, Operational Research seem to be mere slogans. Even the Basic Research is not thorough sound theoretical framework. Research Studies have largely lost their research-rigor. A large number of doctoral degrees in various disciplines are conferred every year. The credibility of research of a large number of Institutions of Higher Education is lost. Who is accountable? A large number of projects are approved and financed by the apex bodies without adequate monitoring. As a result there are meager returns. Even with fair intentions how is it that we have not been in a position to realize the enunciated objectives. To begin with, it is because our objectives though highly sounding are questionable. We need to have a thorough vision of the reality and enunciate the objectives objectively. Otherwise we are likely to keep failing our predicaments. Whether it is logical positivism or naturalistic enquiry, we have not done much. There is very often only a little correspondence amongst the research problems identified, objectives enunciated, methodologies adopted and the emerging theses. Neither we have been in a position to solve immediate problems nor have we been in a position to generalize. Even if we claim to have formulated cognitive and meta-cognition theories, what use are these theories without application or expression.

**Invalid Evaluation in Higher Education:**

Evaluation in higher education is largely invalid right from input through process to output to placement. Our admission criteria in most of the faculties are faulty, because we do not have the research base with respect to the
predictors of performance in various programs. Still, the classical Norm Reference Testing continues in most of the institutes of higher education, promoting competition. Rarely we go by Criterion Referenced Testing and Item Response Theory. In the interview boards, rather than trying to know what the candidates know, we try to make them feel stupid by making them conscious of what they do not know. A large number of interview boards fail to discriminate finely between candidates. The problem becomes, still severe, when we need to discriminate between 98th and 99th percentiles. Internal evaluation, revaluation, double valuation, centralized evaluation, all have question marks. A person with B+ passes the life situations, whereas, A+ fails. What do the degrees of a degree represent, if not the helplessness of the Higher Education System? Rather than grading our product on an n point scale could we have pass and not-pass in Higher Education realizing mastery learning.

**Low Return on Investment in Higher Education:**

Only 5-6% of the persons who are conferred degrees are graduates in the real sense. Ritual convocations without real invocation are meaningless. How to observe the Higher Education wear the scarf with distinction, decency, decorum & discipline and glittering medals with resonating pride? For realizing that, we need to revive the culture of higher education. Rather than formally constituted knowledge commissions, each and every entity of higher education should realize and demonstrate its identity as a Knowledge & Action Commission.

**Self Killing Complacency of Micro-Specialists:**

Self-killing complacency of micro-specialists of Higher Education is a matter of great concern. How much each one of we Professors professes even our own discipline? Higher Education has made us more fragmented than wholistic.

**Placement, Promotion and Administration in Higher Education:**

Where are the alumnus of Higher Education? Most of the institutions of Higher Education do not have record of alumnus. What would be more shameful than the institutions of higher education refusing to recognize their own products. Academic administration of the institution must by thinking, speech and action portray their commitment to high ethical standards. A sizeable number of educational institutions do not observe healthy constellation and ethical climate. Many a academic administrators are not in a position to
observe the laid down acts, rules, resolutions and ordinances. The true test of administration is when the rules and acts are silent. At times the conditions demand administrators to be over and above the system at the same time not against the system.

**State of Arts, Commerce, Science & Administration in Higher Education:**

Art without perspective, commerce without substance, science without ethics, and administration without sensibilities & sensitivities are meaningless. This seems to be the greatest problem of higher education. Who should be the top academic administrators of higher education? These have to be essentially inter-disciplinary experts having rich profiles & balanced personalities. An analysis of the top administration of higher education, nationwide, reveals, that civil servants, industrialists, pure academic professionals, and Statesmen all are misfits in the administration of higher education. There are rare personalities with integrated profiles. The Universities and Institutes of Higher Education have to bear with the best possible available. It is disgracing higher education to plant in-compatible administrators.

**Stereotyped Higher Education:**

A large number of refresher courses which are meant for staff development and capacity building are not serving the envisaged purpose. Rather than designing means for staff development we have more of staff rating scales. These tools are more for describing the field than constructing. Same age old practical are repeated in the science laboratories. Same age old theories are practiced inspite of the changing conditions. Arbitrary criteria are superimposed on the reality promoting fundamentalism. Neither we have been in a position to sustain liberal sciences, nor, scientific realism.

**Micro-Specialization, Narrow Breadth and Shallow Depth:**

Though the various disciplines are doing a lot of service to the society, yet there are many emerging issues and problems. How to stop deforestation? Can Botany contribute to the reduction of pollution? How to mass educate the development of the seasonal plants? How to save endangered species of plants? Can Zoology contribute to the regulation of population? How to correct the imbalances in male-female ratio? How to control diffusible diseases? How to save endangered species, for example, lion, tiger, black- buck? How to realize mass production of compatible medicine? How can Chemistry contribute to the
control of pollution? How to produce degradable polymers? How can Physics realize the conservation of energy using conventional sources? There is a lot left to be discovered/constructed in the areas of laser technology enhancement, transportation and space research. Rather than abstract and empty, mathematics needs to be more real and meaningful. Languages should be register specific and functional. Commerce should be more with service motive. Technology is sweeping the globe. But, there is more of media crowd than culture. Educational Instructional Software are rarely user compatible right from KG to University and continuing education levels. Still there are gender discriminating stereotypes in science and technology and more so at the higher education level.

Though information in Science and Technology is multiplying at exponential rates but still there is a wide gap between the expected rate of evolution of scientific knowledge and what it actually obtains. There are easily perceptible Science and Technology divides in the society. Philosophy and Psychology which are the strongest foundations for society are loosing their identities? How top level administrators very often are found to have low level affect attributes? Our degrees of a Degree are representative of the extent of course completion than developed competencies.

**Inclusive Education: A mere Slogan:**

The expression inclusive education is recurring most frequently these days. What is its origin? What is its structure and function? We talk of multi-lingual models and go on superimposing mono-lingual model. We talk of multi-style teaching, but go on throwing mono-style. We talk of inclusive education but fail to provide differentiated differential inputs. Inclusive education demands highly resourceful dedicated systems.

**Career Advancement Scheme (CAS) in Higher Education:**

CAS in higher education is highly desirable in this age of humanization and democratization, but, it has significantly lost its purpose. The Career Advancement rather than a function of merit is the discretion of whims and fancies of administration and it is loosing credibility due to malpractices prevailing in the institutes of higher education, for example, referees not sending the reports in time, faculty having sound profile being not promoted.
Professional Ethics in Higher Education:

We are largely proud of the Indians for their roles & professional ethics. Inspite of all adverse conditions they perform their duties with all dedication. For parenting Indian parents are models for the globe, for software industry Indian Engineers, for patients Indian Doctors, for learners Indian Teachers. We have harmonious culture and healthy constellation amongst all entities. However, some deviants, here & there spoil the professional excellence, peace & harmony. How? Needs no illustrations. Every one needs to rear the baby. We should not leave it to others. The very presence of doctors relieves the patients of disease and discomfort. All doctors need to observe punctuality & presence. Software engineers should produce vaccines to remedy than viruses to replicate. We teachers need to renew ourselves to remain alive and innovative rather than becoming stale to delete even the already running programs & courses. Rather than neo-liberalism, neo-capitalism, neo-colonialism, let humanism flowing through all professions govern higher education in India.

PROGNOSIS:

Philosophies to Govern Higher Education

There is a need to de-colonize minds. Who will do that? It is Education and Education only. Globalization with equity and equality and sensitivities to the basic culture, liberalization with civilization, Privatization with Service motive, and State with Public Spirit should govern the higher education. The States should not shun away from the responsibility of higher education. With a tendency of doing so, we have already done the greatest harm to the nation. The economy should not try to overarch State and Schools of Higher Education. The economy should realize that it is the return of education. Traditional, conservative, bureaucratic, hierarchical model being a big failure and impeding power, we need to recourse to human relations model. Autonomy, transparency and de-centralization ought to be the salient features of higher education.

Sustaining genuine demand of higher education

Approval for the new Higher Education institutions through NOC should be provided on the basis of up-to-date data, need and demand in public interest. In no case it should be a function of vested interests and malpractices. The norms for recognition of the institutions need to be developed and objectively
observed, irrespective of who constitutes the inspection teams. There should be valid criteria for admission into the Higher Education Programs.

**Correspondence among Objectives, Curricula, Transaction and Evaluation in Higher Education**

We are relatively creative in enunciating the objectives of any program. First dilution takes place at designing of curricula, next in transaction of curricula and highest in evaluation. Every higher education institution should observe an inventory of correspondence amongst various elements of educational instruction design. We need to have clear vision and mission. Gaps between these are lowering the higher education. Particularly, mission functional procedures need to be worked out more meaningfully.

**Consortiums in and networking of higher education**

There should be networking of higher education institutions. More of disciplinary and inter-disciplinary consortia need to be created for sharing of resources. Also, there is a need to establish Consortiums of Research in Education.

**Inter-disciplinary & Trans-disciplinary Higher Education**

More and more inter-disciplinary programs should be designed and implemented in higher education. It should be mandatory for every student of higher education to opt for a course from other faculties to facilitate trans-discipline, and it should be credited.

**Integration of various skills in Higher Education**

Various skills, namely, techno-savvy skills, net-savvy skills, Life skills should be integrated in higher education. In addition to cognition there should be adequate focus on affect attributes and psycho-motor skills. Higher Education ought to be wholistic rather than fragmented.

**Choice Based Credit system**

There should be choice based credit system in higher education. It is possible only when we have innumerable approaches to learning resources, such as, e-contents through open source, learning modules, sharing of credits intra-
faculty, and inter-faculties, intra-university and inter-university. Induction of choice based credit system is very challenging, but, highly desirable.

**Focus on process norms**

If inputs and processes are well taken care of then the output yield and quality are almost ascertained. We do not have adequate mastery on the processes. Some of the institutions have the problem of capacity and burnout, whereas, a sizeable number of them have the problem of throughput and rust-out. Over years we have laid relatively more emphasis on examination reform. We need to reform the processes. There is a need of evolving process norms in almost all areas of Higher Education.

**Evaluation in Higher Education**

There should be semester based credit system and continuous comprehensive internal evaluation in higher education. Various modes of evaluation need to be practiced, such as, activities, assignments, projects, seminars, field work, tests having variety of items, such as, essay, objective and notes. Evaluation should be inclusive of subject specific knowledge, relationship with other subjects, development of psycho-motor skills, life skills and affect attributes. Electronic Distribution of Examination Papers needs to be inducted.

**Research in Higher Education**

Research in higher education should be revealing and suggestive. Along with scientific realism, there should be added focus on phenomenology and construction.

Need to observe Intelligentsia & Ethics in Board of Studies, Faculty Boards, Academic Councils & Executive Bodies

The Board of Studies of various Departments & Faculty Boards should abstain from arbitrary decisions. Not only such decisions are harmful for the particular departments & faculties, but also, these have implications for the wider field. All these Boards, Councils, and Bodies should observe their identities and function as per the acts specified in the constitution observing code of ethics.

**Innovations in Higher Education**
To sustain its identity as Higher, the Higher Education has to be innovative, creative & constructive. The Higher Education ought to be self sustaining through its innovations, production & patents. We feel proud of our Engineers & Doctors who have produced highly valuable products with patents. Our Software Experts are Domain Leaders Globe over.

Concluding Remarks:

With all ifs and buts, the Indian Higher Education has its own strength. The struggle of the average middle class families for higher education of their young ones is remarkable. Higher Education is the highest priority for them. In fact, these are the people who are helping higher education to sustain and develop its identity. Neither the international institutes of higher education, nor the virtual foreign universities can nurture the Indian youth, but it is the indigenous education which can evolve and actualize the self. A thorough analysis of the product of higher education can reveal a lot. We feel proud that we, the innocent public of India have constituted a sovereign, socialistic, secular, democratic, republic India. No economy, howsoever developed, no state howsoever advanced, no judiciary howsoever knowledgeable should commit the mistake of superimposing education, and more so higher education. There is a need to realize inter-disciplinary, trans-disciplinary, inter-domain, wholistic higher education for harmonious living.
Zero-Lecture Program

As a Wholistic Curricular Program in Higher Education

(ZLP)

Prof. B.K. Passi

1. Innovation

I wish to share with you one major innovation which has stood the test of time but is not expanding at the desired rate. May be you would like to improve upon it and implement it in your institution. The special features of this ZLP [Zero-Lecture Program] are

☐ Teacher Talk And Student Achievement – no positive relationship
☐ Self Designed And Self Management Programs Have Been Helpful
☐ Physical, Emotional, Intellectual, And Spiritual Environment
☐ Learning, Working, Living Should Integrate
☐ Planning, Preparing, Discussing, Feedback Giving, And Evaluating
☐ Revising And Transfer To Real Life
☐ Assessment by Self, Peers, Teacher, Induction Supervisor, Headmaster, Parents, Researchers
☐ Experimented with other universities institutions like DIET, Pre-School, B.Ed. And M.Tech, Doctoral Program

2. Experiments At Elementary And Secondary Teacher Education Programs

A number of experiments - called ZLP- have been conducted. Two of them are being reported in two separate papers. In this paper we are reporting to

4 Former Vice-Chair Person NCTE, New Delhi & Former Director, Institute of Education, DAVV, Indore.
an experiment related to secondary teacher education program. The elementary teacher education program has been reported somewhere else. Two experiments are published In Indore, a small group of researchers decided to attempt an innovative program to reverse this trend. They conceptualized, planned, prepared and implemented an interdisciplinary, activity-based, decentralized program managed by participating teachers and students and using a multi-media and multi-modal structure. Given a choice of approaches, the student teachers chose in favor of this “new” teacher education program called the personalized zero-lecture teacher education program. It is a “total immersion” program, with the group planning all things themselves including the physical layout of the room and all support facilities, the society and community work, relationship with program related agencies in the surrounding environment. The Institute of Education did not provide any additional resources to this volunteer group so as to keep parity with other programs in the institute.

The “hot” events and current events having a direct and indirect influence on teacher education are the substance of many unscheduled discussion. Generally, these discussions are frank, unstructured yet serious. Student teachers began to learn the importance of freedom, trust and responsibility. Group presentations, conflict resolutions and value clarification etc. started emerging from the discussions.

The given syllabus topics and curriculum are completed within flexible, small groupings. Presentation of prepared topics through various techniques like team seminars, quizzes, debates, interviews, panel discussions, role playing, games etc. are carried out. A multi-media approach is used. Block presentations of each topic in the syllabus are completed. The presentation, feedback, discussion, clarification, expert teacher comments, reference reading, evaluation of the presentations by teams, assessment and grading of the presentations etc. are carried out continuously by peer trainers. This continues over 2 weeks. No lectures are given by anyone. There are particular improvements observed in cognitive learning, personality changes, and skill improvements through this approach.

The student teachers, teacher educators, critical consultants, school employing authorities, school children, community and media persons have acknowledged the success of this program during the 20 years.
3. **An Overview**

An overview of the program [self managed event]

- **Features Of The Program**
  - Flexible time management
  - Variety of modes of learning zero lecturing by he faculty
  - Diversified and participatory evaluation
  - Personalizing environment
  - Learner’s freedom
  - Outcome compared Teacher as facilitator, organizer & inspirer
  - Field linkages

- **Time Management**
  - No centralized time blocks- calendar
  - Flexibility within working hours
  - Managing time on weekly not on semester basis
  - Management of time: a joint responsibility
  - Flash activities: opportunity to accommodate
  - Autonomy of the group

- **Modes Of Learning**
  - Use variety of modes of learning
  - Zero lecture mode until it is must
  - Content specific learning modes
  - Teacher Specific mode

- **Seminar Mode**
  - Preliminary phase
- Learning phase
- Presentation- observations
- Discussion- feedback- reflections
- Cooperative learning and evaluation

☐ Designing Activities Mode
- Selecting appropriate activity
- Planning execution
- Presentation
- Discussion

☐ Successive Discussion Mode
- Preliminary phase learning
- Discussion (1) pairs (2) small group (3) rotated group
- Presentation
- Discussion and Dialogue

☐ Evaluating Learning - Features
- Diversity in modes of evaluation
- Written, oral recorded
- Performance rehearsed
- Live: spontaneous: on line
- Variety of modes of expression
- Prose, verse
- Skit, cartoons, simulations and gaming
- Role play, debate, aap ki adalat
- Peer participation-evaluation
- Allowed except for written mode
- About 50% weightage
- Examinations
- Situational
- Problematic
- Improvement Questions
- End-Semester question papers
- Personalizing Activities
- Planning, setting, dusting, cleaning, your board
- Exhibiting family photographs & mini profiles, family events
- Sharing diary, sharing new object knowledge
- Silence/prayer, watching nature, acts of kindliness
- Keeping music corner, singing folk songs
- Managing on-going course library
- Dining collectively, sharing, personal liking of local food
- Displaying educational and other work of students
- Arranging innovative excursions and visits
- Arranging meetings with seniors
- Offering opportunities to speak on some important events
- Celebrating birthdays, etc.
- Giving opportunities to manage various activities of special talent, special interest: special schedule Tuesday two hours
- Learner’s Freedom - Students Have Responsible Freedom
- Choosing what they want to study
- Learning wherever they like
- Working under conditions of their own choice
- Designing activities of taste & ability
- Adopting modes & means of presentation according to their dispositions
- Expressing answers the way they like
- Choosing their own group

☐ Role Of Teacher Educator
- Orienting students to activity learning
- Helping to locate learning resources
- Guiding them regarding use of these resources
- Researching new techniques of self learning pedagogy
- Assisting them in preparing for presentation
- Assisting in designing appropriate activities
- Monitoring the execution of activities
- Evaluation learning performance
- Formulating innovative questions
- Evaluating the PTEP-ZLP program
- Beside above
- Maintaining interest & productive participation
- Enhancing sense of belonging and help
- Coordinating among groups
- Understanding learner difficulties & potentialities

☐ Field Linkages
- Teaching in small groups
- Organizing important school, family functions
- Managing playgrounds, library, laboratory, etc.
- Participating in routine tasks
- Undertaking developmental school projects
- Assisting in house system activities
- Helping in elementary children science congress
- Undertaking personalized tutorials in schools

Outcome Compared
- Achievement in final examinations
- Understanding, higher order thinking
- Values, confidence, proaction, cooperation, working together, etc.
- Who benefits most
- All, but more so weaker students
- Assessed by self, peers, teachers, outsiders, researchers
- Economic, time, money, feasible, liked by teacher educators, simplicity, rational,
- What about specialized subjects—same as Ph.D.
- Employers have liked them, and employed these students

Acknowledgements
We are grateful to Dr.A.Sadgopal, Mr.S.C.Behar, Dr.M.S.Sodha, [Dr.S.K.Tyagi, Dr. Chaya Goel], Dr.U.C.Vashishtha, Dr.S.P.Malhotra, Dr. D.R. Goel, and many other friends for their professional, administrative and personal help. All views expressed here are personal.
Some thoughts on the idea of a University

Prof. R.P. Sharma

There is hardly any soul in India today, who would not feel happy and proud at the pomp and pageantry displayed at the India gate and other venues on the 63rd Republic Day. As the martial sounds of the march past and the fly past drown away and spur people on to attend to their daily chores, I settle down to marshal my disquiet which is somewhat inseparable from my nature. Unmistakably this disquiet is of philosophical nature, which more often than not, tugs at the educational scenario prevailing in our country. What better way and opportunity to vent and share this intellectual discomfiture with – “co-brethren of the quill” – (an expression used to identify those who belong to the same profession) all through the medium of your newborn Journal.

Not long ago there was a news item, well-publicised that none of the Indian universities finds any spot in the first hundred top ranking universities of the world. This news byte must have stung every thinking being who is directly or indirectly related to the field of education per se and the universities in particular. Just setting aside the voracity and the mechanism of arriving at this judgement, it does jolt every sensitive being to introspect and invite an inquest into the state of affairs in this domain. What follows is not only a brief impromptu prologue of the well thought out dialogue in which I intend to engage myself and others in future, time on our part and space on the part of the Journal permitting. I am sure there are issues and problems aplenty in the field of higher education, teacher education notwithstanding, which provide grist to the mill for encounters of the intellectual kind.

Triggered by the happenings in the recent past one is bound to reflect on the nature and functions of a modern university particularly in the context of India. The theme unmistakably leads one to thumb through the writings of Cardinal Newman (the idea of University), Abraham Flexner (the idea of modern university) as also that stimulating exposition of the subject by Karl Jaspers (the idea of University) - translated by Karl W Deutsch.

5 Former Head and Dean, CIE, University of Delhi.
'The soul of a people is well mirrored by the universities they establish', holds Lord Haldane and the universities in India are no exceptions, even while suffering yawning social lag, and in some cases even the academic lag. That the products of our universities are no match to the ones belonging to the advanced nations, could be an overshot, perhaps expressed by the minds who would have their own yardsticks to measure academic standards or even their commercial interests to minister. But one must not fight shy of examining one's own standpoint.

One way of debating these issues regarding the health of these citadels of higher learning is to look into how the scholars and scientists of different hues and dispositions respond to the major concerns of the universities and other autonomous research and professional institutes for our immediate purpose, Flexner mentions four such concerns:

1. the conservation of knowledge and ideas
2. the interpretation of ideas
3. the search for truth
4. the training of students who would practice and “carry on”

Certainly this list of functions would swell as we launch into the formulation of an ideal template or the actual variants are available and others in the embryo, in India.

To this repertoire of functions Jaspers would like to add ‘creative cultural life’ which is very much linked to the other functions of academic teaching and scientific and scholarly research. These functions underlying the need of intellectual dialogue and communication for which the whole universe would be a campus.

One may hardly disagree with the common import of what the universities stand for. The Oxbridge model the German and the American ones together with the French model have all their own distinct flavour and intellectual fermentation.
The issue before us is whether we are to exist and flourish? Only in the shadow of the so-called Ivy institutes as the fountain heads of knowledge and learning or we have the traditional wisdom – the cultural capital, and the inner thrust to create our reconstruct our own centres of learning, and without insulating ourselves from the creative wisdom and scholarship of other cultures and centres of learning.

Equally contentious is the question whether the academic word ought to be shaped in accordance with the immediate needs and aspirations of the society or it must discover and rediscover its own wit and genius which could thrive without being a social weathercock. The latter position may fly in the face of the growing economies and democratic polities. Can we cling to a set pattern of some ‘academic constants, without being alive to the ‘civilisational variables’”?

One is provoked to ask the tone and the tenor of the academic interaction, the inner dynamics of the University community composed of scholars and scientists, who are either pliant or defiant and a few free wheelers. How would the assertive democracies view the sacred precincts of knowledge as a closed society?

Do we agree with the two statements I have culled from Flexner’s work:

1. Universities must at times give society not what society wants, but what it needs. Inertia and resistance have their uses provided they be based on reasonable analysis, on a sense of values, not on mere habit.

2. The University professor has an entirely objective responsibility – a responsibility to learning, to his subject and not the psychological or parental responsibility for his students. No fear that he will in consequence be dehumanised.

The sting is in the tail, and obviously some of us are bound to be at variance with this skewed argumentation. Democracy has its premises no less profound than the ones cited above.

I now switch on to another significant aspect of University affairs, more so in the context of the quality of what universities produce – the obvious reference point is the curriculum that various faculties and disciplines trot out in the name of generation of new knowledge and education in its application. Considering that curriculum has an architectonic value for higher education, a
periodic auditing of its design, direction and development becomes imperative to retain its health and sustain its progress.

Zeroing on the Indian knowledge-scape how do we view the adage that no sane human being can transcend his own epoch – how far are the universities in India, of all types, are faithfully responding to the needs and aspirations of the knowledge economy as also the prerequisites of a pluralistic polity?

To what extent and measure can we allow the cosmos of knowledge to be inhabited by positive sciences and technologies only costing a pervasive impact on the lifestyle, attitude and values, that too eclipsing the very survival of humanity based disciplines? The pitch is queered by the market forces which call all the shots. Social sciences, with the exception of economics have to adorn the mantle of sciences to acquire respectability, with an articulate disdain for disciplines which raise questions of the first order, such as philosophy which has and in its essence still can, mother natural sciences. Aristotle has upstaged Plato and Socrates. The defences of these developments are to be found in diversity, speed, specialisation and entrepreneurial expressions.

The issues regarding epistemology and the modus operandi of the present educational dispensation strike another distinct cord. And then, there is a whole field of education - its disciplinary problems, the nature and quality of teacher training courses which need oxygen and other resurrecting treatments. But these and many more problems will constitute the agenda for the future engagements.

I have just broached the issues, nibbling at a sample of the enormous problems that constitute the corpus of University learning, without discussing the full implications. The scholarly and reflective faculty members of this university and other institutions must have their own honoured standpoints and their weltanshauung to put forth their line of thought. Education being the meeting spot we are bound to develop a CRITIQUE OF PRACTICAL (USEFUL) EDUCATION as also the CRITIQUE OF PURE EDUCATION, in the fashion of Immanuel Kant. Your response(s) would definitely be valued and publicised, hopefully through the instrument of this Journal.

My felicitations to you and all other faculty members of this Department for providing the much-needed forum for creative thoughts and expression. Sincerely hope it becomes viable in all respects.
COMPARISON OF ITEM DISCRIMINATION INDICES 
OF DIFFERENT 
FORMATS OF MULTIPLE DISCRIMINANT TYPE

AND

MULTIPLE CHOICE TEST ITEMS

Dr. Shanti Tejwani⁶
Prof. S.K. Tyagi⁷

Abstract

The present study attempts to compare the Item Discrimination of Multiple Choice Items (MCI) and different formats of Multiple Discriminant Type Test Items (MDTI). The researcher developed a test with different formats i.e. MDTI with two stems and eight options and MDTI with two stems and six options and MCI with three options for comprehension of concepts of the course ‘Measurement and Evaluation’. The three developed formats were administered on a sample of 635 students selected randomly from Teacher Training Colleges of different Universities. Two least frequently chosen options were removed and the test was reduced to two stems with six options. The test was further reduced to separate parts of one stem and three options ones using the exposed analysis. The data were analyzed using Repeated Measure one way ANOVA. Results indicated that the Mean Item Discrimination indices of MDTI with two Stem Eight Options, two Stem Six Options and MCI with one Stem Three Options differ significantly.

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INTRODUCTION

Education system is inconceivable without evaluation in the same form. Though there are many different types and variations of items such as Multiple choice, Permutation Multiple Choice Question (PMCQ), Multiple Discriminant Type Test Items (MDTI), True-False, Matching, Short answer, Essay type etc. Multiple Choice Test Item is one of the most popular test items which is used in various Competitive exams like GRE, NET, IAS, NDA etc. In Multiple Choice Test with four Options students answer simply through guessing with 25% success. For the reducing the percentage of guessing, a new test item has been suggested i.e. Multiple Discriminant Type Test Items (MDTI). A Multiple Discriminant Type Item (MDTI) consists of more than one stem, say two or three with eight or Twelve Options (as one against one item (stem) and four or three options in multiple-choice item). The alternatives are constructed in such way that they work as distractors for all the two or three stems/items. Each stem has one correct answer or key. This type of test items significantly reduces the chances of guessing in comparison to MCI.

A great number of the researches in the field of education across the world is currently focusing on Types of Test Items. Some of the earliest among researchers viz. Stratton and Catts (1980), Owen and Froman (1987), Cizek and O’day (1994), Bruno and Dirkzwager (1995) & Abad, Olea and Vicente (2001) focused their researches on optimal number of alternative choices in a multiple choice test item. They recommended and concluded that three alternative multiple-choice test items, in typical classroom settings, were optimal. Also Trevisan, Sax and Micheal (1991) found that the reduction of number of options had no material effect on internal consistency reliability. Plumlee (1952), Elley & Mangubhai (1992), Chan and Kennedy (2002), Hastedt & Dirk (2004)
conducted studies to investigate the effect of different format of questions. Plumlee (1952), Elley & Mangubhai (1992) found that the answer format does not have a statistically significant difference on the result, whereas Chan and Kennedy (2002), Hastedt & Dirk (2004) found that the answer format has an effect on the result of the given item. Multiple Choice items are solved on average statistically significantly better than Open-ended items.

Farthing, Jones & Mcphee (1998) analysed the Permutational Multiple Choice Questions and Essay Type Questions. It was found that the PMCQs did not adequately discriminate between the stronger and the weaker candidates. A correlation of only 0.598 was disappointingly low. This meant some weaker candidates did well with PMCQs, and a few stronger candidates did slightly worse. In the second trial in 1997 they found differences between three correlation coefficients to be statistically insignificant. That means every section of the exam paper discriminated equally well between the stronger and weaker candidates.

Swanson et al. (2006) investigated the impact of item format and number of options on the psychometric characteristics and response time for MCIs. They found that test of items with more options were harder and required more testing time. No differences in item discrimination were observed.

Coderre et al. (2004) studied the effect of MCI and EMI (Extended Matching Items) formats on the problem solving strategies. The results showed that two formats were equally potent in testing problem solving abilities, and the number of alternatives did not have significant impact on psychometrics or problem solving strategies utilized. During testing problem solving strategy the question stem or content was more important than the number of alternatives.

Banerjee (2004) developed a validated test in Statistics for B.Ed measurement and evaluation course using MDTI. The investigator evaluated
MDTI from the point of item discrimination, item difficulty, reliability and validity. The major findings of the study were: the reliability of test was .77. The correlation coefficient of only one item with the whole test was not significant. Rests of the items were found to be valid.

The findings of different studies cited here are a bit inconsistent. Moreover, no study has been undertaken on comparing the Discrimination Indices of Different Formats of Multiple Discriminant type test item with Multiple Choice Test Items. Hence, the present study was undertaken.

OBJECTIVE

The Objective of the present study was formulated as below:

To compare the Mean Item Discrimination Indices of MCI with Three Options, MDTI with Two Stems Eight Options and MDTI with Two Stems Six Options test formats respectively.

HYPOTHESIS

The following was the hypothesis of this study:

There is no significant difference in the Mean Item Discrimination Indices of MCI with Three Options, MDTI with Two Stems Eight Options and MDTI with Two Stems Six Options test formats respectively.

SAMPLE

The sample was selected randomly. The present study was conducted on B.Ed. & M.Ed. students of different universities i.e. D.A.V.V. Indore, Lucknow University, Allahabad University, Meerut University and Banaras University of 2007-08 academic sessions. The sample comprised of 635 students in all.
TOOLS

The investigator developed Achievement Test with different formats of Test Items i.e. MDTI with two stems and eight options (ii) MDTI two stems and six options and (iii) MCI with one stem and three options on Measurement and Evaluation subject. Initially an MDTI with two stems eight options Achievement test was developed. It had 80 questions; after try out of items and following the item analysis 24 inferior questions were dropped. Finally, 56 questions were retained in the test. Then the comprehension test having MDTI with two non-functioning options removed i.e. comprising of two stems and six options was further reduced to two MCI with three options each. Each test format had 56 Questions. One mark was given for each correct answer. Thus, the marks could range from 0 to 56. The Medium of the test was Hindi as well as English.

PROCEDURE OF DATA COLLECTION

The Heads of the selected colleges were requested for permission to conduct the study within the college premises. Following the rapport with the students, the selected test were administered with instructions. Firstly, having administered the test of MDTI with two stems and eight options on a small initial sample the responses were scored carefully and analysed empirically. Then from that test two non-functioning options were removed leading to another format of MDTI test i.e. MDTI with two stems and six options. This test was further reduced to MCI format with one stem and three options. After developing all the formats of the test, all three tests were administered on different sample of students.

RESULTS

Firstly, Item Discrimination Indices for each item in the Three Test formats were computed. The data were then analysed with the help of Repeated
Measure One Way ANOVA through GLM in SPSS. The results regarding the assumption of normality for Item Discrimination Indices of Three Test Formats are given in Table 4.3.0 below.

**Table 4.3.0: One-Sample Kolmogorov-Smirnov Test for the Item Discrimination Indices of Three Test Formats**

<table>
<thead>
<tr>
<th>Test Formats</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>Most Extreme Differences</th>
<th>K-S Z</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Absolute</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+Ve</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-Ve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MDTI with Two Stems Eight Opts.</td>
<td>0.3366</td>
<td>.0808</td>
<td>7</td>
<td>.129</td>
<td>.12</td>
<td>.965</td>
</tr>
<tr>
<td>MDTI with Two Stems Six Opts.</td>
<td>0.3487</td>
<td>.0804</td>
<td>5</td>
<td>.081</td>
<td>.08</td>
<td>.606</td>
</tr>
<tr>
<td>MCI with Three Options</td>
<td>0.2880</td>
<td>.0780</td>
<td>5</td>
<td>.112</td>
<td>.11</td>
<td>.841</td>
</tr>
</tbody>
</table>

Table 4.3.0, shows that the three Z–values of K-S test of all the Test Formats are not significant at 0.05 level, meaning that normality of distributions of discrimination indices of all Three Test Formats can safely be assumed. Before Performing Repeated Measure One Way ANOVA and its proper interpretation Mauchly’s Test of Sphericity was conducted. The results are given in Table 4.3.1 below.
Table 4.3.1: Mauchly’s Test of Sphericity for the Item Discrimination Indices in Three Test Formats

<table>
<thead>
<tr>
<th>Within Subjects Effect</th>
<th>Mauchly’s W</th>
<th>df</th>
<th>Approx Chi-Square</th>
<th>Sig.</th>
<th>Epsilon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.986</td>
<td>2</td>
<td>.769</td>
<td>0.681</td>
<td>0.986</td>
</tr>
<tr>
<td>Test Format</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The analysis indicates that the Mauchly’s Sphericity test statistics W is not significant with df=2 since the probability (0.681) is greater than 0.05, Thus it can be assumed that the variances are equal and the sphericity assumption has been met. Therefore, the Test of Within Subjects Effects can be interpreted with sphericity assumptions. Table 4.3.2, shows the summary of Repeated Measure One way ANOVA.

Table 4.3.2: Summary of Repeated Measure One Way ANOVA for the Item Discrimination Indices in Three Test Formats (Test of Within Subjects Effects)

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MSS</th>
<th>F</th>
<th>Sig.</th>
<th>Eta-Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Format</td>
<td>.116</td>
<td>2</td>
<td>0.058</td>
<td>11.154</td>
<td>.000</td>
<td>0.168</td>
</tr>
<tr>
<td>Sphericity-Assumed</td>
<td>.116</td>
<td>1.972</td>
<td>0.059</td>
<td>11.132</td>
<td>.000</td>
<td>0.168</td>
</tr>
<tr>
<td>Greenhouse-Geisser</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Huynh-Feldt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the table, it is evident that F-value for Item Discrimination Indices is 11.154, which is significant at 0.01 level with df equal to 2/110. It indicates that the mean Item Discrimination Indices of MDTI with Two Stems Eight Options, MDTI with Two Stems Six Options and MCI with Three Options test formats differ significantly. In the light of this, the null hypothesis that ‘there is no significant difference in the mean Item Discrimination Indices of Items in MCI with Three Options, MDTI with Two Stems Eight Options and MDTI with Two Stems Six Options test formats’ is rejected. It may, therefore, be concluded that Item Discrimination Index was found to be significantly influenced by test item format. Further, in order to study pair-wise differences in the mean Item Discrimination Indices, pair-wise comparisons were made using SPSS, the results of which are presented below in Table 4.3.3.

<table>
<thead>
<tr>
<th></th>
<th>Lower Bound</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.116</td>
<td>2.000</td>
<td>0.058</td>
<td>11.154</td>
<td>.000</td>
<td>0.168</td>
</tr>
<tr>
<td></td>
<td>.116</td>
<td>1.000</td>
<td>0.116</td>
<td>11.154</td>
<td>.002</td>
<td>0.168</td>
</tr>
<tr>
<td><strong>Error</strong></td>
<td><strong>Sphericity-Assumed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenhouse-Geisser</td>
<td>.574</td>
<td>110</td>
<td>0.0052</td>
<td>108.465</td>
<td>0.0053</td>
<td></td>
</tr>
<tr>
<td>Huynh-Feldt</td>
<td>.574</td>
<td>110</td>
<td>0.0052</td>
<td>55</td>
<td>0.0104</td>
<td></td>
</tr>
<tr>
<td>Lower Bound</td>
<td>.574</td>
<td>55</td>
<td>0.0104</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.3.3: Pair-wise Comparison of Item Discrimination Indices of Different Test Formats

<table>
<thead>
<tr>
<th>Test Format</th>
<th>Mean</th>
<th>SE</th>
<th>Format (I)</th>
<th>Format (J)</th>
<th>Mean Difference</th>
<th>SE</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDTI with Two Stems Eight Options</td>
<td>0.336</td>
<td>.011</td>
<td>(1)</td>
<td>(2)</td>
<td>0.0122</td>
<td>.013</td>
<td>1.000</td>
</tr>
<tr>
<td>MDTI with Two Stems Six Options</td>
<td>0.348</td>
<td>.011</td>
<td>(2)</td>
<td>(3)</td>
<td>0.0608**</td>
<td>.013</td>
<td>0.000</td>
</tr>
<tr>
<td>MCI with Three Options</td>
<td>0.288</td>
<td>.010</td>
<td>(1)</td>
<td>(3)</td>
<td>0.0486**</td>
<td>.014</td>
<td>0.004</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level of significance

Table 4.3.3 presents results of multiple comparisons performed on the three pairs using the Bonferroni adjustment. The fourth column of this table presents the comparisons of the mean Item Discrimination Index of Test Format of MDTI with Two Stems Eight Options, Test Format of MDTI with Two Stems Six Options and that of Test Format of MCI with Three Options. The Fifth column shows the actual difference between each pair of means being compared. Column seventh shows the Significance levels, indicating whether or not any
given pair of means is significantly different. Since \( p < 0.05 \) in this column for first two comparisons, it can be concluded that mean Item Discrimination Index of Test Format of MDTI with Two Stems Eight Options and Test Format of MDTI with Two Stems Six Options, was each significantly different from that of Test Format of MCI with Three Options respectively.

The same is not true, however, for the difference in mean item discrimination indices of Test Format of MDTI with Two Stems Eight Options and Test Format of MDTI with Two Stems Six Options. The difference between Test Format of MDTI with Two Stems Eight Options and MDTI with Two Stems Six Options is not statistically significant, since \( p > 0.05 \) for this comparison in the Significance level column.

**Graph 1.1.0: Test Format-wise Means of Item Discrimination Indices**

Graph 1.1.0 illustrates that mean Item Discrimination Index of MDTI with Two Stems Eight Options Test Format (\( M = 0.337 \)) and MDTI with Two Stems Six Options Test Format (\( M = 0.349 \)) were each significantly higher than Mean Item Discrimination Index of MCI with Three Options (\( M = 0.288 \)). The
mean Item Discrimination Index of MDTI with Two Stems Eight Options Test Formats was a bit lower (M = 0.337) than MDTI with Two Stems Six Options (M = 0.349), but the difference was not significant. This indicates that both Test Formats of MDTI had better discrimination power than MCI with Three Options Test Format.

**Discussion**

The present study compared the mean Item Discrimination Indices of items in MCI with Three Options, MDTI with Two Stems Eight Options and MDTI with Two Stems Six Options test formats. On the basis of analysis of the data it was found that the mean Item Discrimination Index of each of the MDTI with Two Stems Eight Options and MDTI with Two Stems Six Options test formats were significantly higher than the mean item discrimination index of MCI with Three Option test format respectively. This result is opposed to the finding of Coderre et al. 2004; they revealed that the average of item discrimination index of Extended Matching Items is lower than MCI. The finding is obvious in view of the fact that multiple choice items are basically test of discrimination. An item with distractors would in general demand greater discrimination than an item with lesser number of distractors. Hence, MDTI with Two Stems Six Options and MDTI with Two Stems Eight Options are expected to be more discriminating than MCI with Three Options, thus corroborating the results of the study.

However, the mean item discrimination index of MDTI with Two Stems Eight Options was slightly lower than MDTI with Two Stems Six Options. The direction of this result was not supported by Cizek and O’Day 1998; they found that the reduction from 5 to 4 alternatives produced significantly decrease in the discrimination in items. On the other hand this result is opposed to the findings of Swanson et al. 2006; and Trevisan et al. 1991; who found that there was no
significant difference in item discrimination index when number of options was increased. The reason for this finding may lie in the fact that there was more number of quality distractors in MDTI with Two Stems Six Options in comparison to MDTI with Two Stems Eight Options. That is why the discrimination power of MDTI with Two Stems Six Options was found to be higher than MDTI with Two Stems Eight Options.

References:


Perception of Distance mode Teacher Trainees About Learner Support Services

Professor P.K. Sahoo

Teacher education programmes involve various kinds of activities leading to development of conceptual knowledge regarding teaching, skills of performing teaching - learning and evaluation functions and positive attitude towards teaching profession. Distance mode teacher education programme adopts the prescribed norms of professional quality control bodies like National Council of Teacher Education (NCTE) and Distance Education Council (DEC) for organisation of teacher training activities. Learner support Services (LSS) in teacher education programme play key roll in facilitating learning experiences related to theory based and practical based courses. The prescribed norms for theory and practice activities are directly linked with traditional institution based teacher preparation. LSS role is well defined to empower distance learners to perform various kinds of academic functions, viz, clarity of concepts by going through print based study materials and expert cocenselling, performing course based assignments with the help of counsellors and mentors; participation in micro teaching programme with the support of teacher educations; preparation and delivery of subject lessons in real classroom situations under the supervision of mentors and the teacher educators; development and implementation of teaching learning and evaluation materials in real situation, participation in school management activities, co-curricular activities and community services. The entire teacher preparation practices at grass root level need well organised support by teacher educators and mentors. The extent to which the LSS personnel are involved in organisation of local level support services indicate the success of distance education based teacher training programme. There are different background factors that cause

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variations in the performance level of LSS like university system, students personal background and their residential locations. The students perception regarding the problems encountered in LSS and their expectations from LSS can be very well linked with the variations in these background factors. In the Indian contest, the experiences of distance mode secondary teacher education programmes has a long history. The LSS has occupied a refined status in ODL based teacher education programme at secondary stage. The empirical evidences concerning perception of secondary level teacher education students shall reveal the existing status of the functioning of LSS and make the system more relevant and efficient. The present study is conducted with a focus on perception of Open University level B.Ed. trainees about academic learner support services with following objectives.:

- To explore problems perceived by distance mode trainees in LSS in the context of university, gender and locality background.
- To explore expectations of distance mode B.Ed. trainees from LSS in the context of university and locality background.

Hypothesis of the Study:
The response pattern of students regarding problems of LSS is significantly independent from their university, gender and locality background.

- The response pattern of students regarding expectations from LSS are significantly independent from their university, gender and locality background.

Methods and Procedures:
The study focused on the LSS organised for B.Ed. trainees in UP state by India Gandhi National Open University (IGNOU) and UPRT Open University (UPTOU). The structure of LSS for B.Ed. programme of IGNOU and UPTOU follow common guideline of B.Ed. programme of IGNOU, hence, the common ground for comparison was ensured in the study. The sample
respondents of the study were chosen from two study centres of IGNOU and three study centres of UPRTOU. In all 240 students (120 from each University) were identified as sample respondents, depending on their availability in the study centres. Data were gathered with the help of a questionnaire developed on the line of B.Ed. programme guide for LSS. The data were analyzed descriptively as well as with the help of chi-square tests. Analysis and interpretation of data have been done taking in to account different components of LSS and background variables of learners.

**Problems of LSS concerning self learning materials as perceived by B.Ed. Trainees:**

Study of print based self learning materials forms a significant component of ODLS. The theoretical portions covered in study materials focus on conceptual clarity as well as various implications of the subject in teaching learning practices. Learner support is essential in facilitating learning through self study materials. The counsellors organise various kinds of activities in this regard. Problems concerning counselling activities on this aspect are mainly of three types (see Table 1): Lectures during counselling sessions were repetition of study material contents; problems concerning conceptual complexities remain unsolved and the activities mainly focused on lectures by counsellors rather than trainee centred processes. The analysis of data concerning perception of students and its association with their university, gender and locality background reveals that students perception of just repetition of study materials content in lectures was not independent of their university background and locality. Such problem was mainly noticed by UPRTOU students (70.83%) and students belonging to rural areas (66.92%). Moreover, there was strong association between locality factor with the problem concerning non solution of conceptual problems of students during counselling session at .01 level of significance. It can be observed from Table 1 that majority of rural students
(61.54%) faced such problem in comparison to their urban counterparts (38.46%)

In the case of third problem i.e., lectures over dominated group learning methods during counselling session was perceived to be more prominent by a large majority of students (52 + 61 percent) irrespective of their university, gender and locality background. Such response pattern of students was found independent of the background variables viz., university, gender and locality.

**Problems of LSS concerning students assignments:**

Students seek assistance for completing different kinds of course based assignments. Moreover, evaluated response sheets act as a major source of sustaining motivation in studies by learners of distance education. Table 2 reveals that almost 50 percent of students irrespective of their university, gender and locality background perceived it problematic to understand the assignments with regard to counsellor's role in guiding students for preparing assignments. It was found that the response pattern of the B.Ed. trainees was not independent of their gender and locality background. It can be observed from Table 2 that majority of students from men's category (55%) and rural areas (53%) complained about indifference of counsellors in solving problems of the trainees concerning assignment completion. Such was not the case with women students and urban localities. The data concerning assignment based feedbacks revealed that majority of students (58-67%) in respective of their university, gender and locality background did not complain about feedback related problems. However a sizable number of (33 to 42 percent) students complained that the feedbacks given on assignments did not help much in their studies. Such response pattern was found independent of background variable of distance learners.

**Problems of LSS concerning B.Ed. trainees teaching competencies:**

The major focus of LSS in teacher education programme remains on
organizing various kinds of activities for development of teaching competencies of teaching competencies of the B.Ed. trainees of ODLS. Table 3 reveals that the response pattern of trainees regarding all the five items were found independent of university, gender and locality backgrounds since the obtained chi-square values were found not significant at .05 level. The item wise evidences from Table 3 reveal that 34 to 56 percent students perceived it problematic to comprehend properly the demonstration of different teaching skill components for microteaching practices. It can be observed that 45 to 52 percent students found it difficult to prepare micro teaching lesson plans. Similarly, almost average number of students (45 to 52 percent) complained about their difficulties in preparing general lesson plans. LSS highlights formative evaluation of micro teaching lessons as well as general classroom based teaching by the mentors and counsellors. Almost average number of students (42-56%) complained about feedbacks given by the counsellors during microteaching lessons were inadequate for mastery of teaching skills. Similar was the response pattern of teacher trainees regarding the counsellors not paying attention towards preparation and delivery of general teaching lesson plans in real classroom situations. The above facts reveal that irrespective of trainees university background, gender variation and locale factors almost average number of trainees perceived major problems concerning support services provided for microteaching practices and general classroom based teaching practices.

**Problems of LSS concerning school based teaching practicals:**

In ODLS based teacher education, practices concerning classroom teaching are done at the trainees school level. The trainees are supposed to locate own mentors at school level. Moreover some of the practical activities concerning teaching are done under the supervision of the teacher educators from the concerned area. Table 4 reveals that there existed strong association
between the response pattern of the trainees and different background factors with regard to identifying mentor teacher at school level by the trainees. The chi-square test values were found significant at .05 level of in the case of all background variables. It can be observed that majority of trainees from UPRTOU (55%) and rural background (53.85%) stated about their problems to locate suitable mentors for guiding the lesson plans and its delivery at school level. The situation was reverse in the case of trainees belonging to IGNOU and urban location. It can be observed from the same table that there was no significant association between the response pattern of the trainees and their university, gender and locality background appropriate regarding lack of provision of appropriate teacher educators to guide the trainees school based practice teaching lessons. Almost average member of trainees (46 to 54%) complained that appropriate number of teacher educators were not available for lesson plan guidance and observation of general practice teaching lessons in different subject areas.

Problems of LSS concerning B.Ed. trainees role in development and use of teaching learning and evaluation materials:

As per curriculum guidelines every teacher trainee is expected to prepare and use appropriate teaching learning and evaluation materials under the supervision of respective counsellors and mentors. It can be observed from Table 5 that there was no significant association between the trainees response pattern and their background variables in the case of all the three statements except one item Table 5 reveals that irrespective of trainees university background, gender variation and locality majority of students (46 to 52 percent) stated about their difficulties in understanding their role in the context of using different kinds of tests and evaluation measures. Similarly 49 to 58 percent of students stated about the inadequacy of practical activities concerning development and administration of tests in classroom situation. A sizable
number of students (48 to 51 percent) irrespective of their university and locally differences stated that guidance provided for development of teaching leaning material was inadequate. However, it was noticed that the gender and response pattern of students was not independent from each other with regard to this statement significantly at .05 level. A large majority (59.23%) of men students complained about lack of suitable guidance in preparation of teaching learning materials. The response pattern was just reverse with regard to women students.

**LSS problems related to trainees role in school management activities:**

Every ODL B.Ed. trainee is supposed to participate in various kinds of school management activities such as preparation of timetable, maintaining school records, conducting action research, organization of school assemblies etc. On such learning experiences the trainees response pattern was found independent of their university background, and locality background (see Table 6). A large chunk of ODL trainees (45 to 59 percent) did not have problems regarding their participation in school management activities. There was significant association between gender and students response pattern on this item at .05 level of significance. While majority of men students (51.54%) faced problems concerning their role in organization school based practicals the case was reverse with regard to women students (60.91%).

**Problem of LSS concerning B.Ed. trainees participation in community services and co-curricular activities:**

Training experiences concerning competencies in organisation of community services and co-curricular activities is a meaningful component of B.Ed. programme. It can be observed from Table 7 that a large chunk of students from different backgrounds (48-71%) did not perceive problems concerning above experiences. There was no significant association between students response pattern and their university background, gender and locality factor on two items, viz.:
• Activities concerning community services and its relevance to trainees;
• Guidance related to co-curricular activities developed trainees organizational skill.

However the gender background had significant association with students response concerning organization of various kinds of activities at programme study centres. It can be observed from Table 7 that comparatively more number women students (71%) did not have problem regarding various activities than their men counterparts (56.15%). There was no significant association between students response pattern and their university and locality background. It can be interpreted that majority of students perceived such activities relevant and meaningful.

LSS problems concerning the human resource support:

The counsellors and study centre co-coordinators role in organisation of LSS concerning is very much pertinent in the B.Ed. training programme. It is a positive indication that in almost all the cases majority of trainees appreciated the role of resource persons, counsellors and the programme centre co-ordinations irrespective of University gender, and locality variations. It can be observed from Table 8 that there was strong association between students response pattern and university, gender and locality background with regard to their response towards counsellors and programme co-ordinators role. It was found that comparatively more number of students (73.73%) from IGNOU expressed positive response on these points than their UPRTOU counterparts (56-61%). The women students (78-79%) were more positive towards human support system than their men counterparts (53%). The urban students were more positive towards human support system (74-77%) than their rural counterparts (54-58%). However on the contrary to this picture a large segment of students from UPRTOU (44 to 58 percent); men group (47 to 55 percent) and
rural background (42 to 53%) had been critical about the role of counsellors and the study centre co-ordinations in LSS.

**Expectations of B.Ed. trainees from LSS with regard to theory courses:**

The expectations of trainees from LSS can be understood very well in the context of their problems faced in different contexts of LSS. It can be noticed from Table 9 that a large majority of students (81-87%) irrespective of their university, gender and locality background expected use of appropriate methods and techniques by the counsellors to solve problems concerning difficult concepts of the course. Similarly huge number of respondents (81-90%) expected organisation of small group based activities. Table 9 reveals that there was significant association between response pattern and university background at .05 level. It was found that comparatively larger number of students from UPRTOU (90%) had insisted on this point than their IGNOU counterparts (81%). Such expectations can be linked with the facts stated in Table 1 that mostly lectures delivered by the counsellors dominated the teaching learning practices as per large chunk of students belonging to UPRTOU and rural background.

**Expectations of B.Ed. trainees regarding LSS on development of teaching competencies:**

The core component of LSS in teacher education programme is to make appropriate provisions for development of teaching competencies in simulated as well as real classroom situations. The case is more complicated in distance education setup in comparison to that of face to face mode. In this context a large majority of ODL students stated about different support system activities should be organised at programme centres and in their practising schools. It can be observed from Table 10 that a large majority of students (70-92%) expected the following provisions.
• Demonstrations by teacher educators must be specific in the context of different skill components;
• Facilities for video-based demonstrations on teaching skills must be available in study centres;
• Skill components must be explained by teacher educators point-wise with the help of video lessons.
• Interaction between trainees and teacher educators must be encouraged during demonstration of teaching skills.
  It can also be observed from Table 10 that a large majority of students (69 to 94 percent) had expected about following role teacher educators during teaching practices.
• Lesson plan demonstrations must cover different components of teaching skills;
• Teacher educator must give adequate feedback to each trainee on delivery of microteaching lessons.
• Adequate interaction must take place between teacher educators and trainees for preparation of lesson plans.
  All the background factors were associated with different expectations significantly in most of the items. The chi-square test results revealed that larger number of urban students (87%) insisted on demonstration of skills than their rural counterparts (74%). Majority of gents trainees (79 to 88%) suggested about video demonstrations than their women trainee counterparts. It can also be observed from Table 10 that more number of women students (92%) insisted on better interaction of teacher educators with trainees during demonstration of teaching skills. The university factor had strong association with response pattern of students regarding detailed coverage of teaching skill components in demonstration and provision for adequate feedback to trainees on delivery of microteaching lessons. The IGNOU students (83 to 91%) were more vocal
about these expectations than their UPRTOU counterparts (69 to 79%). Similarly larger number of women students (95%) were expecting teacher educators seriousness in coverage of different skill components of teaching than their men counterparts (86%). With regard to trainees expectations concerning feedbacks on delivery of micro lessons larger chunk of urban students (94%) were more vocal than that of their rural counterparts (82%).

**Expectations of B.Ed. trainees concerning LSS on learner assignments:**

Various kinds of practical based assignments are treated integral part of ODL B.Ed. curriculum. LSS facilitates completion of assignments related to course work from Table 11 it can be observed that a large majority of students (76 to 88%) expected appropriate counselling for-

- understanding the nature of different assignments and its relevance;
- preparation of assignments and
- improvement of learners performance in studies through evaluation of assignments.

There was no significant association between response pattern and students background variables with regard to first two points. Cutting across university, gender and locality variables 79 to 86 percent students expected major role of LSS in understanding the nature of assignments and preparing assignments appropriately. There was strong association between students response and gender with regard to provision of diagnosing the academic problems of students through assignments and suggesting remedial measures to overcome their problems. It can be observed from Table 11 that comparatively larger member of women students (88%) insisted on such provision than that of their men counterparts (78%). The above response pattern can be very well linked with assignment related problems stated in Table 2.

**Expectation of B.Ed. Trainees regarding LSS for preparation and use of teaching learning and evaluation materials:**
Students need proper guidance for developing appropriate teaching learning and evaluation materials and their application in classroom situation. It can be observed from Table 12 that a large number of students (75 to 88%) expected the following in this regard:

- organization of relevant activities to understand role of trainees in developing such materials;
- provision for timely feedback on preparation and administration of question papers, test items and psychological tests; and
- activity based guidance for development of teaching learning materials.

Table 12 reveals that there existed strong association between the response pattern of students and their university background with regard to the expectation concerning the role of trainees in development and use of teaching learning and evaluation material. Comparatively larger number of UPRTOU students (88%) demanded that relevant activities must be organized to enable learners to understand their role in development and use of such materials. In rest of the cases, a large majority of students expressed high expectations from LSS regarding teaching learning and evaluation materials irrespective of university, gender and locality background.

**Expectation of B.Ed. trainees from LSS regarding community services and co-curricular activities:**

LSS is very much significant in guiding B.Ed. students for development of organizational skills and positive attitude concerning community services and co-curricular activities. Data concerning expectations of B.Ed. students regarding this component of LSS. Table 13 reveals that a large majority of students (76088%) stated about use of appropriate methods in following areas:

- to design community services under the supervision of counsellors/mentors.
- to supervise field work by the study centre co-ordinators/counsellors; and
• to organise training concerning organisation of co-curricular activities.

It can also be observed from Table 13 that there was significant association between locality factor and students response regarding suitable design of community services under the supervision of mentors/counsellors. More number of urban students (88%) expressed favourable opinion regarding this than that of their rural counterparts (78%). In rest of the cases there was no significant association between the background factors and response pattern concerning suitable LSS for organization of community services and co-curricular activities.

**Expectation of B.Ed. trainees concerning the role of counsellors and study centre co-ordinators:**

The counsellors and programme centre co-ordinators play prominent role in organisation of LSS in any professional programme. It can be observed from Table 14 that a large majority of students (71 to 88%) suggested the following role of counsellors/programme co-ordinators. In LSS they must be well acquainted with the problems of the trainees;
• they must pay serious attention to such problems;
• the co-ordinators must be accountable to B.Ed. trainees regarding solution of problems.

Table 14 reveals that there was significant association between university background and students expectations regarding acquaintance of counsellors/mentors with the problems of trainees comparatively larger number of IGNOU students (86.67%) expressed such expectations from counsellors that their UPRTOU counterparts (75.83%) similarly there was high level association between gender and students response regarding co-ordinators to be accountable to students of ODL system in solution of their problems. Such expression was more prominent among women students (84.55%) than their men counterparts.
As a whole, the expectations of students regarding their counsellors and co-ordinators were more focused one.

**Expectation of B.Ed. trainees concerning orientation of resource persons:**

In continuation to the presentation on the foregoing section a large majority of B.Ed. trainees (76.88%) perceived that the mentors must be orientated duly about their role in B.Ed. training programme; there must be provision for regular supervision of teaching lessons by teacher educators; and there must be provision for learner feedback on delivery of every lesson. Besides these facts it can be observed from Table 15 that there was significant association between students expectations and their university background. Comparatively larger number (86.67%) IGNOU students expressed in favour of orientation of mentors than their UPRTOU students (75.83%) Similarly if was noticed that there was significant association between gender background with students expectations about feedback provision on delivery of every lesson by the trainees. Comparatively larger member of women students (89.09%) were more vocal about such provision than that of their men counterparts (48.18%).

**Major findings and discussion:**

The study reveals that solving knowledge oriented and skill oriented problems of professional programme depended heavil on teacher centred activities at programme centres. Predominance of lecture method by the counsellors during contact classes was a common feature of LSS. The situation was more prominent in the state open university centres and in rural centres. The expectations of students for organization of small group based activities in clarification of concept related problems during counselling sessions was quite genuine in nature. The role of counsellors in enabling the trainees to understand various kinds of assignments and completing the same appropriately. The students perception regarding indifference of counsellors regarding such area,
particularly among students of men category and rural background was of alarming nature. However, majority of students were satisfied with assignment based feedback mechanism. Students expectations from counsellors/ mentors regarding their above roles in assignments must be understood with right perspective.

Since professional competency development activities involve practical activity based training in simulated situations and real classroom situations, expert guidance must play significant role in training process. The problems concerning lesson preparation and its delivery need to be supported by proper demonstration, peer reviews and feedback to the trainees. The facts reveal genuine problems of teacher trainees regarding micro teaching based training activities as well as general lesson delivery based activities. Inadequacy in guidance and feedbacks on teaching practices performed in simulated situation as well as real classroom situation must be attended properly by the LSS personnel. Moreover, training activities carried out at trainees own school level had been associated with several problems like identification suitable mentors at local level, their limited guidance in preparation and delivery of lesson and teacher educators lack of supervision of delivery teaching lessons. Hence, the trainees expectations from the LSS is considered more genuine concerning detailed skill based demonstration by teacher educators; facilities for appropriate media support in training practices and provision for detailed interaction of teacher educators with the trainees on their performances. The ODL system must be more sensitive about adequate human resource support to the distance trainees on this issue. Moreover, media and technology based LSS which is almost neglected in teacher training practices need to be strengthened at study centre level. Appropriate delivery system must be streamlined considering the trainees background factors. The complementary role of information and communication technology supported training with traditional
teacher dominated training must be encouraged with flexibility, relevancy and suitability in specific training situations.

Teacher trainees problems concerning clarity of their role in development and application of teaching learning and evaluation materials in real school situation are worthy of references. Inadequacy in guidance as perceived by different groups of trainees must be dealt in properly at local level. Exposure to alternative form of support system must be encouraged. The school based experiences must be lively in nature and formative evaluation of such activities must be linked with day to day practices. Similarly, the problems faced by men students concerning organization of school based management practices draw special attention of teacher educators. Their expectations concerning activity based presentations, timely feedback on preparation of good test items, question papers and psychological test administration techniques, organization of appropriate activities concerning school management practices etc. must be highlighted as significant component of LSS. Teacher trainees problems concerning organization of co-curricular activities and community services were not perceived with much intensity. The problems might not be perceived because of working teachers (trainees) acquaintance with different practices adopted at their own school level on these areas. However, majority of them expected that the activities need to be designed and implemented under the supervision of expert mentors and teacher educators at grass root level. Above all, the success of LSS in teacher preparation depends heavily on the efficiency level and attitude of the mentors, teacher educators and the programme coordinators. Even though majority of B.Ed. trainees appreciated the role of counsellors and coordinators. in LSS, they expected that the counsellors and coordinators must have proper understanding of B.Ed. trainees problems and must have positive attitude towards the students. These facts lead to empowerment of the human support system of ODL based B.Ed. programme. Currently the
traditional face to face mode pattern mode training system dominates the training practices of distance B.Ed. programme. Appropriate strategies must be adopted to empower the teacher educators/counsellors and mentors to facilitate training practices of ODL system mode trainees. The uniqueness of ODL mode delivery system, LSS and ICT facilities must be designed appropriately in the empowerment processes of the counsellors/ facilitators of B.Ed. distance mode system.
<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td><strong>1. a</strong> Lectures on theory papers are just repetition of self study materials.</td>
<td>Agree</td>
<td>53 (44.17)</td>
<td>85 (70.83)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>67 (55.83)</td>
<td>35 (29.17)</td>
</tr>
<tr>
<td>Chi value</td>
<td>17.46</td>
<td><strong>x²=2.73</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1. b</strong> Problems concerning understanding the self study materials are not solved during counseling sessions.</td>
<td>Agree</td>
<td>47 (44.17)</td>
<td>57 (47.48)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>73 (55.83)</td>
<td>63 (52.52)</td>
</tr>
<tr>
<td>Chi value</td>
<td>x²=1.70 NS</td>
<td>x²=6.53 NS*</td>
<td></td>
</tr>
<tr>
<td><strong>1. c</strong> During counseling sessions lecturers are delivered in place of trainee oriented activities.</td>
<td>Agree</td>
<td>65 (54.17)</td>
<td>73 (60.83)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>55 (45.83)</td>
<td>47 (39.17)</td>
</tr>
<tr>
<td>Chi value</td>
<td>x²=1.09 NS</td>
<td>x²=0.32 NS</td>
<td></td>
</tr>
</tbody>
</table>
Note: Figures in parentheses indicate percentages

*  \( X^2 \) Value Significant at .05 level
** \( X^2 \) Value Significant at .01 level
NS: Not Significant
Table - 2
Problems perceived by B.Ed. Trainees assignment related learner support services: University wise, gender wise and locality wise

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>2. a</td>
<td>It is problematic to understand the assignments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>60 (50.00)</td>
<td>54 (45.00)</td>
<td>62 (47.69)</td>
</tr>
<tr>
<td>Disagree</td>
<td>60 (50.00)</td>
<td>66 (55.00)</td>
<td>68 (52.31)</td>
</tr>
<tr>
<td>Chi value</td>
<td>x²=0.60 NS</td>
<td>x²=0.05 NS</td>
<td>x²=4.04*</td>
</tr>
<tr>
<td>2. b</td>
<td>The Counsellors do not solve the problems concerning completion of assignments.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>40 (33.33)</td>
<td>57 (47.50)</td>
<td>71 (54.62)</td>
</tr>
<tr>
<td>Disagree</td>
<td>80 (66.67)</td>
<td>63 (52.50)</td>
<td>59 (45.38)</td>
</tr>
<tr>
<td>Chi value</td>
<td>5.00*</td>
<td>x²=17.04**</td>
<td>x²=12.94*</td>
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<tr>
<td>2. c</td>
<td>Feed backs given on assignments do not help much in our studies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>44 (36.67)</td>
<td>47 (39.17)</td>
<td>55 (42.31)</td>
</tr>
<tr>
<td>Disagree</td>
<td>76 (63.33)</td>
<td>73 (60.83)</td>
<td>75 (57.69)</td>
</tr>
<tr>
<td>Chi value</td>
<td>0.16 NS</td>
<td>$x^2=2.32$ NS</td>
<td>$x^2=0.08$ NS</td>
</tr>
</tbody>
</table>

**Note:** Figures in parentheses indicate percentages

* $X^2$ Value Significant at .05 level

** $X^2$ Value Significant at .01 level

**NS:** Not Significant
Table - 3
Problems perceived by B.Ed. Trainees teaching competency development related learner support services:
University wise, gender wise and locality wise

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>3. a</td>
<td>It is problematic to comprehend the demonstration concerning different skill components in microteaching.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>53 (34.17)</td>
<td>67 (55.83)</td>
<td>72 (55.38)</td>
</tr>
<tr>
<td>Disagree</td>
<td>67 (55.83)</td>
<td>53 (44.17)</td>
<td>58 (44.62)</td>
</tr>
<tr>
<td>Chi value</td>
<td>3.27 NS</td>
<td>$x^2=2.35$ NS</td>
<td>$x^2=1.33$ NS</td>
</tr>
<tr>
<td>3. b (i) We find it difficult to prepare micro teaching lesson plans.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>55 (45.83)</td>
<td>60 (50.00)</td>
<td>66 (50.77)</td>
</tr>
<tr>
<td>Disagree</td>
<td>65 (54.17)</td>
<td>50 (50.00)</td>
<td>64 (49.23)</td>
</tr>
<tr>
<td>Chi value</td>
<td>$x^2=0.42$ NS</td>
<td>$x^2=0.92$ NS</td>
<td>$x^2=0.41$ NS</td>
</tr>
<tr>
<td>3. b (ii) We find it difficult to prepare general teaching Lesson plans.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>55 (45.83)</td>
<td>60 (50.00)</td>
<td>66 (50.77)</td>
</tr>
<tr>
<td>Disagree</td>
<td>65 (54.17)</td>
<td>60 (50.00)</td>
<td>64 (49.23)</td>
</tr>
<tr>
<td>Chi value</td>
<td>$x^2=0.42$ NS</td>
<td>$x^2=0.92$ NS</td>
<td>$x^2=0.41$ NS</td>
</tr>
<tr>
<td>3. c Feedbacks given by counsellors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>50 (41.67)</td>
<td>67 (55.83)</td>
<td>65 (50.00)</td>
</tr>
</tbody>
</table>
during micro teaching lessons are inadequate for mastery of skills.

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>4. a</td>
<td>Agree</td>
<td>44 (36.67)</td>
<td>66 (55.00)</td>
</tr>
</tbody>
</table>

Note: Figures in parentheses indicate percentages
* $X^2$ Value Significant at .05 level
** $X^2$ Value Significant at .01 level
NS: Not Significant

Table - 4
Problems perceived by B.Ed. Trainees school based practical activities related learner support services: University wise, gender wise and locality wise
A mentor who can guide me well for Lesson Plan preparation and its delivery.

<table>
<thead>
<tr>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 (45.83)</td>
<td>76 (63.33)</td>
</tr>
<tr>
<td>60 (50.00)</td>
<td>54 (45.00)</td>
</tr>
<tr>
<td>70 (53.85)</td>
<td>68 (52.31)</td>
</tr>
<tr>
<td>51 (46.36)</td>
<td>77 (70.00)</td>
</tr>
<tr>
<td>76 (50.77)</td>
<td>60 (46.15)</td>
</tr>
<tr>
<td>54 (49.09)</td>
<td>70 (63.64)</td>
</tr>
</tbody>
</table>

**Chi value**
- $x^2 = 8.12^{**}$
- $x^2 = 7.80^{**}$
- $x^2 = 7.34^{**}$

4. b My teaching is incomplete because of lack of provision for teacher educators for observation of practice teaching Lessons.

<table>
<thead>
<tr>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 (54.17)</td>
<td>65 (54.17)</td>
</tr>
<tr>
<td>60 (50.00)</td>
<td>60 (50.00)</td>
</tr>
<tr>
<td>60 (46.15)</td>
<td>60 (46.15)</td>
</tr>
<tr>
<td>59 (53.64)</td>
<td>59 (53.64)</td>
</tr>
<tr>
<td>64 (49.23)</td>
<td>64 (49.23)</td>
</tr>
<tr>
<td>56 (50.91)</td>
<td>56 (50.91)</td>
</tr>
</tbody>
</table>

**Chi value**
- $x^2 = 0.42 NS$
- $x^2 = 1.33 NS$
- $x^2 = 0.67 NS$

**Note:** Figures in parentheses indicate percentages
* $X^2$ Value Significant at .05 level
** $X^2$ Value Significant at .01 level
NS: Not Significant
Table - 5
Problems perceived by B.Ed. Trainees involved in development of TLM and evaluation materials related learner support services: University wise, gender wise and locality wise

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>5. a It is problematic to understand trainees role in the context of use of different kinds of tests and evaluation measures.</td>
<td>Agree 62 (51.67)</td>
<td>63 (52.50)</td>
<td>65 (50.00)</td>
</tr>
<tr>
<td></td>
<td>Disagree 58 (48.33)</td>
<td>57 (47.50)</td>
<td>65 (50.00)</td>
</tr>
<tr>
<td></td>
<td>Chi value $x^2=0.02$ NS</td>
<td>$x^2=0.08$ NS</td>
<td>$x^2=0.64$ NS</td>
</tr>
<tr>
<td>5. b Practical activities concerning development and administration of tests are in inadequate for myself.</td>
<td>Agree 61 (50.83)</td>
<td>65 (58.33)</td>
<td>69 (53.08)</td>
</tr>
<tr>
<td></td>
<td>Disagree 59 (49.17)</td>
<td>55 (41.67)</td>
<td>61 (46.92)</td>
</tr>
<tr>
<td></td>
<td>Chi value $x^2=0.27$ NS</td>
<td>$x^2=0.23$ NS</td>
<td>$x^2=0.54$ NS</td>
</tr>
<tr>
<td>5. c Guidance given for development of teaching learning material is inadequate for myself.</td>
<td>Agree 57 (47.50)</td>
<td>61 (50.83)</td>
<td>77 (59.23)</td>
</tr>
<tr>
<td></td>
<td>Disagree 63 (52.50)</td>
<td>59 (49.17)</td>
<td>53 (40.77)</td>
</tr>
<tr>
<td>Item</td>
<td>University wise</td>
<td>Gender wise</td>
<td>Locality wise</td>
</tr>
<tr>
<td>------</td>
<td>-----------------</td>
<td>-------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>6. a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>49</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(40.83)</td>
<td>(42.50)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>71</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(59.17)</td>
<td>(57.50)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>x²=0.07 NS</td>
<td>x²=3.72 NS</td>
</tr>
</tbody>
</table>

**Note:** Figures in parentheses indicate percentages

* $X^2$ Value Significant at .05 level

**$X^2$ Value Significant at .01 level

NS: Not Significant

Table - 6
Problems perceived by B.Ed. Trainees role in school management activities related learner support services: University wise, gender wise and locality wise
**  $X^2$  Value Significant at .01 level

NS:  Not Significant
Table - 7
Problems perceived by B.Ed. Trainees training activities on community services and co-curricular activities related learner support services: University wise, gender wise and locality wise

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>7. a</td>
<td>Agree</td>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 (33.33)</td>
<td>80 (66.67)</td>
<td>57 (43.85)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>51 (42.50)</td>
</tr>
<tr>
<td></td>
<td>x² = 2.14 NS</td>
<td></td>
<td>x² = 5.56*</td>
</tr>
<tr>
<td>7. b</td>
<td>Agree</td>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td></td>
<td>47 (39.17)</td>
<td>73 (60.83)</td>
<td>56 (43.08)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>57 (47.50)</td>
</tr>
<tr>
<td></td>
<td>x² = 1.70 NS</td>
<td></td>
<td>x² = 0.39 NS</td>
</tr>
<tr>
<td>7. c</td>
<td>Agree</td>
<td>Disagree</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51 (42.50)</td>
<td>69 (57.50)</td>
<td>64 (49.33)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>63 (52.50)</td>
</tr>
<tr>
<td></td>
<td>x² = 4.23 NS</td>
<td></td>
<td>x² = 0.79 NS</td>
</tr>
</tbody>
</table>

It is a formality to organize different activities in the study centres other than delivery of lectures.
Activities related to community work does not help much to teacher trainees.
Guidance related to co-curricular activities do not enable trainees to organize them in real school situation.
<table>
<thead>
<tr>
<th></th>
<th>Chi value</th>
<th>$x^2=2.41$ NS</th>
<th>$x^2=2.05$ NS</th>
<th>$x^2=0.67$ NS</th>
</tr>
</thead>
</table>

**Note:** Figures in parentheses indicate percentages

* $X^2$ Value Significant at .05 level

**$X^2$ Value Significant at .01 level

NS: Not Significant
Table - 8
B.Ed. trainees perception on problems related to role of L.S.S. personnel

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>8. a Counsellors do not pay attention to my questions.</td>
<td>Agree</td>
<td>52 (43.33)</td>
<td>52 (43.33)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>68 (56.67)</td>
<td>68 (56.67)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>$x^2=0.00$ NS</td>
<td>$x^2=5.10^*$</td>
</tr>
<tr>
<td>8. b Counsellors are indifferent towards my academic problems.</td>
<td>Agree</td>
<td>32 (26.27)</td>
<td>53 (44.17)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>88 (73.73)</td>
<td>67 (55.83)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>$x^2=8.03^{**}$</td>
<td>$x^2=17.72^{**}$</td>
</tr>
<tr>
<td>8. c The study centre co-ordinator does not solve our problems on time.</td>
<td>Agree</td>
<td>32 (26.27)</td>
<td>46 (38.33)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>88 (73.73)</td>
<td>74 (61.67)</td>
</tr>
<tr>
<td>Chi value</td>
<td>$x^2=3.72^*$</td>
<td>$x^2=16.42^{**}$</td>
<td>$x^2=10.28^{**}$</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------</td>
<td>------------------</td>
<td>------------------</td>
</tr>
</tbody>
</table>

**Note:** Figures in parentheses indicate percentages  
* $X^2$ Value Significant at .05 level  
** $X^2$ Value Significant at .01 level  
NS: Not Significant
Table - 9
Expectations of B.Ed. Trainees from learner support services about course activities: University wise, gender wise and locality wise

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>University wise</td>
<td>Gender wise</td>
<td>Locality wise</td>
</tr>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>9. a</td>
<td>The teacher educators should adopt appropriate methods and techniques for solving complete problems of trainees related to theoretical aspects of the B.Ed. course.</td>
<td>Agree</td>
<td>105 (87.50)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>15 (12.50)</td>
<td>21 (17.50)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>$x^2=1.18$ NS</td>
<td>$x^2=0.33$ NS</td>
</tr>
<tr>
<td>9. b</td>
<td>Activities in study centres must be of small group based nature.</td>
<td>Agree</td>
<td>97 (80.83)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>23 (19.17)</td>
<td>12 (10.00)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>$x^2=4.05^*$</td>
<td>$x^2=0.12$ NS</td>
</tr>
</tbody>
</table>

**Note:** Figures in parentheses indicate percentages

* $X^2$ Value Significant at .05 level

**$X^2$ Value Significant at .01 level

NS: Not Significant
Table - 10
Expectations of B.Ed. Trainees from learner support services regarding training activities: University wise, gender wise and locality wise

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>10. a Demonstration by teacher educators must be specific in the context of different skill components.</td>
<td>Agree</td>
<td>103 (85.83)</td>
<td>95 (79.17)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>17 (14.17)</td>
<td>25 (20.83)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>$x^2=1.85$ NS</td>
<td>$x^2=2.10$ NS</td>
</tr>
<tr>
<td>10. b Facilities for Video Lesson based demonstrations of teaching skills must be available in study centres.</td>
<td>Agree</td>
<td>105 (87.50)</td>
<td>84 (70.00)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>15 (12.50)</td>
<td>36 (30.00)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>$x^2=10.98$ **</td>
<td>$x^2=4.85$ *</td>
</tr>
<tr>
<td>10. c Skill components must be explained by teacher educators points wise with the help of video Lesson demonstrations.</td>
<td>Agree</td>
<td>104 (86.67)</td>
<td>89 (74.17)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>16 (13.33)</td>
<td>31 (25.83)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>$x^2=5.95$ *</td>
<td>$x^2=10.33$ **</td>
</tr>
<tr>
<td>10. d Interaction between trainees and teacher educators and teacher</td>
<td>Agree</td>
<td>109 (90.80)</td>
<td>104 (86.67)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>11</td>
<td>16</td>
</tr>
</tbody>
</table>
educators must be encouraged during demonstration of teaching skills.

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi value</td>
<td>$x^2=1.04 \text{ NS}$</td>
<td>$x^2=9.71^{**}$</td>
<td>$x^2=2.62 \text{ NS}$</td>
<td>$x^2=2.62 \text{ NS}$</td>
<td>$x^2=9.71^{**}$</td>
<td>$x^2=2.62 \text{ NS}$</td>
<td>$x^2=9.71^{**}$</td>
<td>$x^2=2.62 \text{ NS}$</td>
</tr>
</tbody>
</table>

10. e Lesson plan demonstration must cover different components of teaching competencies.

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi value</td>
<td>$x^2=22.25^{**}$</td>
<td>$x^2=5.95^{*}$</td>
<td>$x^2=0.02 \text{ NS}$</td>
<td>$x^2=0.02 \text{ NS}$</td>
<td>$x^2=5.95^{*}$</td>
<td>$x^2=0.02 \text{ NS}$</td>
<td>$x^2=5.95^{*}$</td>
<td>$x^2=0.02 \text{ NS}$</td>
</tr>
</tbody>
</table>

10. f The teacher educator must give adequate feedback to each trainee on delivery of micro teaching Lessons.

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi value</td>
<td>$x^2=7.19^{**}$</td>
<td>$x^2=3.42 \text{ NS}$</td>
<td>$x^2=6.99^{**}$</td>
<td>$x^2=6.99^{**}$</td>
<td>$x^2=3.42 \text{ NS}$</td>
<td>$x^2=6.99^{**}$</td>
<td>$x^2=3.42 \text{ NS}$</td>
<td>$x^2=6.99^{**}$</td>
</tr>
</tbody>
</table>

10. g Adequate interaction must take place between teacher educator and trainees related to preparation of Lessons Plans.

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi value</td>
<td>$x^2=0.22 \text{ NS}$</td>
<td>$x^2=2.93 \text{ NS}$</td>
<td>$x^2=1.25 \text{ NS}$</td>
<td>$x^2=1.25 \text{ NS}$</td>
<td>$x^2=2.93 \text{ NS}$</td>
<td>$x^2=1.25 \text{ NS}$</td>
<td>$x^2=2.93 \text{ NS}$</td>
<td>$x^2=1.25 \text{ NS}$</td>
</tr>
</tbody>
</table>

**Note:** Figures in parentheses indicate percentages

* $X^2$ Value Significant at .05 level
** $X^2$ Value Significant at .01 level
NS: Not Significant
### Table - 11
Expectation of B.Ed. Trainees from learner support services regarding assignments: University wise, gender wise and locality wise

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>11. a</td>
<td>Appropriate guidance must be given to enable trainees to understand different views of assignments.</td>
<td>Agree</td>
<td>95 (79.17)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disagree</td>
<td>25 (20.83)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>$x^2$=0.00 NS</td>
<td>$x^2$=0.44 NS</td>
</tr>
<tr>
<td>11. b</td>
<td>Appropriate guidance must be given to enable trainees to prepare assignments.</td>
<td>Agree</td>
<td>102 (85.00)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disagree</td>
<td>18 (15.00)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>$x^2$=1.39 NS</td>
<td>$x^2$=1.70 NS</td>
</tr>
<tr>
<td>11. c</td>
<td>Appropriate steps be taken to diagnose the problems of trainees through assignments and suggest</td>
<td>Agree</td>
<td>105 (87.50)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disagree</td>
<td>15 (12.50)</td>
</tr>
</tbody>
</table>
remedial measures to overcome their problems.

| Chi value | \( x^2 = 3.00 \) NS | \( x^2 = 3.97^* \) | \( x^2 = 0.33 \) NS |

**Note:** Figures in parentheses indicate percentages  
* \( X^2 \) Value Significant at .05 level  
** \( X^2 \) Value Significant at .01 level  
NS: Not Significant
**Table - 12**  
Expectation of B.Ed. Trainees from learner support services regarding TLM & evaluation tools: University wise, gender wise and locality wise

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>12. a</td>
<td>Activities concerning the role of trainees in tests and evaluation measures must be organized adequately to enable them to understand their role in it.</td>
<td>Agree</td>
<td>91 (75.83)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>29 (24.17)</td>
<td>14 (11.67)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>x²=6.37*</td>
<td>x²=0.49 NS</td>
</tr>
<tr>
<td>12. b</td>
<td>Teacher educators must give feedback to each trainees on preparation of question papers test items any psychological test.</td>
<td>Agree</td>
<td>96 (80.00)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>24 (20.00)</td>
<td>16 (13.33)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>x²=1.92 NS</td>
<td>x²=0.03 NS</td>
</tr>
<tr>
<td>12. c</td>
<td>Guidance on preparation of teaching learning materials must be activity</td>
<td>Agree</td>
<td>102 (85.00)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>18 (15.00)</td>
<td>28 (23.33)</td>
</tr>
<tr>
<td>based.</td>
<td>Chi value</td>
<td>$x^2=2.69$ NS</td>
<td>$x^2=0.48$ NS</td>
</tr>
</tbody>
</table>

**Note:** Figures in parentheses indicate percentages

* $X^2$ Value Significant at .05 level

**$X^2$ Value Significant at .01 level

NS: Not Significant
Table - 13  
Expectation of B.Ed. Trainees from learner support services regarding co-curricular activities: University wise, gender wise and locality wise

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>13. a</td>
<td>Workout organization of community Services under supervision of counsellors.</td>
<td>Agree</td>
<td>108 (81.67)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>22 (18.33)</td>
<td>29 (24.17)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>x²=2.02 NS</td>
<td>x²=0.06 NS</td>
</tr>
<tr>
<td>13. b</td>
<td>Supervision of field work by study centre co-ordinators.</td>
<td>Agree</td>
<td>109 (82.50)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>21 (17.50)</td>
<td>25 (20.83)</td>
</tr>
<tr>
<td></td>
<td>Chi value</td>
<td>x²=0.42 NS</td>
<td>x²=0.02 NS</td>
</tr>
<tr>
<td>13. c</td>
<td>Paying attention on training related to co-curricular activities.</td>
<td>Agree</td>
<td>96 (80.00)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>24 (20.00)</td>
<td>27 (22.50)</td>
</tr>
<tr>
<td>Item</td>
<td>University wise</td>
<td>Gender wise</td>
<td>Locality wise</td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
<td>-------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>14. a The counsellors must be well acquainted with problems of distance mode B.Ed. trainees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>105 (87.50)</td>
<td>96 (80.00)</td>
<td>103 (71.54)</td>
</tr>
<tr>
<td>Disagree</td>
<td>15 (12.50)</td>
<td>24 (20.00)</td>
<td>37 (28.46)</td>
</tr>
<tr>
<td>Chi value</td>
<td>$x^2=2.48$ NS</td>
<td>$x^2=8.22$**</td>
<td>$x^2=2.20$ NS</td>
</tr>
<tr>
<td>14. b The counsellors must pay serious attention to the problems of distance mode B.Ed. trainees.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>103 (85.83)</td>
<td>107 (89.20)</td>
<td>99 (86.15)</td>
</tr>
<tr>
<td>Disagree</td>
<td>17 (14.17)</td>
<td>13 (0.80)</td>
<td>31 (23.85)</td>
</tr>
</tbody>
</table>

**Note:** Figures in parentheses indicate percentages
* $X^2$ Value Significant at .05 level
** $X^2$ Value Significant at .01 level
NS: Not Significant

Table - 14
Expectation of B.Ed. Trainees from learner support services personnel: University wise, gender wise and locality wise
The Study Centre Co-ordinators must be accountable to solve course related problems of B.Ed. trainees.

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>14. c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>108 (81.67)</td>
<td>103 (85.83)</td>
<td>104 (80.00)</td>
</tr>
<tr>
<td>Disagree</td>
<td>22 (18.33)</td>
<td>17 (14.17)</td>
<td>26 (20.00)</td>
</tr>
</tbody>
</table>

Chi value $x^2=0.61$ NS $x^2=5.76^*$ $x^2=0.53$ NS

Chi value $x^2=0.36$ NS $x^2=0.84$ NS $x^2=1.24$ NS

Note: Figures in parentheses indicate percentages
* $X^2$ Value Significant at .05 level
** $X^2$ Value Significant at .01 level
NS: Not Significant

Table - 15
Expectation of B.Ed. Trainees related to orientation of learner support services personnel: University wise, gender wise and locality wise

<table>
<thead>
<tr>
<th>Item</th>
<th>University wise</th>
<th>Gender wise</th>
<th>Locality wise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IGNOU</td>
<td>UPRTOU</td>
<td>Gents</td>
</tr>
<tr>
<td>15.a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>104 (86.67)</td>
<td>91 (75.83)</td>
<td>102 (78.46)</td>
</tr>
<tr>
<td>Disagree</td>
<td>16 (13.23)</td>
<td>29 (24.17)</td>
<td>28 (21.54)</td>
</tr>
</tbody>
</table>
B.Ed. trainees.

<table>
<thead>
<tr>
<th></th>
<th>Chi value</th>
<th>$x^2=4.62^*$</th>
<th>$x^2=1.45$ NS</th>
<th>$x^2=0.33$ NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. b</td>
<td>There must be provision for must an supervision of practice teaching Lessons by teacher educators.</td>
<td>Agree</td>
<td>103 (85.83)</td>
<td>97 (80.83)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>17 (14.17)</td>
<td>23 (19.17)</td>
<td>28 (21.54)</td>
</tr>
<tr>
<td>Chi value</td>
<td>$x^2=1.08$ NS</td>
<td>$x^2=0.01$ **</td>
<td>$x^2=0.16$ NS</td>
<td></td>
</tr>
<tr>
<td>15. c</td>
<td>There must be provision for giving feedback to trainees on delivery of every practice teaching Lessons.</td>
<td>Agree</td>
<td>106 (88.33)</td>
<td>96 (80.00)</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>14 (11.67)</td>
<td>24 (20.00)</td>
<td>29 (51.82)</td>
</tr>
<tr>
<td>Chi value</td>
<td>$x^2=3.13$ NS</td>
<td>$x^2=6.89$ **</td>
<td>$x^2=1.85$ NS</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Figures in parentheses indicate percentages

* $X^2$ Value Significant at .05 level

** $X^2$ Value Significant at .01 level

NS: Not Significant
IMPLEMENTING PEDAGOGY TECHNOLOGY INTEGRATION
IN TEACHER EDUCATION

Dr. H.K. Senapaty

Abstract

Paradigm shifts in education in recent years envisions a new type of learning culture that demands ICT integration with pedagogy in Teacher Education Programme. Implementing the pedagogy-technology integration in teacher education and managing the changes are highly complex and possibly one of the most challenging tasks for any teacher education institution. ICT has to be infused into pedagogy in such a way that its uses can improve learning. The proposed model is derived from international and national studies on ICT development that has identified a series of broad stages that educational system and institutions typically proceed through in the adoption and the use of ICT. These broad stages have been termed as Emerging, Applying, Infusing and Transforming stages of ICT development (UNESCO, 2005). The model is then mapped on the basis of: (a) stages of ICT usage and (b) pedagogical usages of ICT. At the heart of good teaching with technology there are three core components: content, pedagogy, and technology, along with the relationships among and between them. The interactions among the three components, account for the wide variations seen in the extent and quality of pedagogy technology integration. These three knowledge bases (content, pedagogy, and technology) form the core of the technology, pedagogy, and content knowledge (TPACK) framework (Koehler & Mishra, 2008; Mishra & Koehler, 2006). The framework describes how teachers’ understandings of technology, pedagogy, and content can interact with one another to produce effective discipline-based teaching with educational technologies. In this framework, there are three

9 Principal, RIE, NCERT, Bhopal, M.P.
interdependent components of teachers’ knowledge: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). In view of this, here an attempt has been made to discuss various issues and strategies for implementation of pedagogy-technology integration in teacher education for teacher development.

Information and communication technologies have revolutionized our society. In last two decades, technology has dramatically penetrated into every area of society and, every aspect of social and cultural lives. Television was the initiator. Television rediscovered and recast the world as a direct experience. Computers made it possible for vast amount of information to be made instantly available and modified with a keystroke. The very nature of work has changed, with an increasing demand for workers who could master the new technologies and use them to conduct business that formerly did not require computer at all. Our children have been raised in a world of instant access to knowledge. They are used to create an environment where they control information flow and access with the press of a button, in which geographic mobility, intellectual flexibility, and the synthesis of work and learning are the norms in the work place.

Although schools are embedded in our culture and reflect its values, the technological changes that have swept through society at large have left the educational system largely unchanged. In last two decades a dramatic rift has opened between the process of teaching and learning in the school and the way of obtaining knowledge in society at large. There have been no wholesale revisions in the curriculum and no substantial change in the process of teaching. The result is an estrangement of the schools from society, and from the children who live in it.
This estrangement has a negative effect. The institutions responsible for educating our children are locked in the past. In the classroom knowledge is presented to them in a linear, didactic manner that differs dramatically from the children’s previous experience outside the school. For the children, school is rigid, uninteresting and ultimately alienating. This divergence between our children and our educational practice needs a drastic educational reform so that it will bring the classroom and the society into one line. The National Curriculum Framework 2005 is an attempt to minimize the estrangement between the school and community.

We are entering a world that is changing in all spheres: scientific and technological, political, economic, social, and cultural. The emergence of the 'knowledge-based’ society is changing the global economy and the status of education. There is growing awareness among policy-makers, political leaders and educators that the educational system designed to prepare learners for an agrarian or industry-based economy will not provide students with the knowledge and skills they will need to thrive in the 21st century’s knowledge-based economy and society. The new knowledge-based global society is one in which:

the world’s knowledge base doubles every 2–3 years;

- 7,000 scientific and technical articles are published each day;
- data sent from satellites orbiting the earth transmit enough data to fill 19 million volumes every two weeks;
- graduates of secondary schools in industrialized nations have been exposed to more information than their grandparents were in a life-time;
- there will be as much change in the next three decades as there was in the last three centuries (National School Board Association, USA, 2002).
The challenge confronting our educational systems is how to transform the curriculum and teaching-learning process to provide students with the skills to function effectively in this dynamic, information-rich, and continuously changing environment.

The UNESCO Information and Communication Technologies in Teacher Education (2002) notes that the technology-based global economy also poses challenges to countries as national economies become more internationalized, with the increasing flow of information, technology, products, capital, and people between nations. This new economic environment is creating a new era of global competition for goods, services, and expertise. All of these changes are producing dramatic shifts in the political, economic and social structures of many countries around the world. These trends pose new challenges to educational systems to prepare students with the knowledge and skills needed to thrive in a new and dynamic environment of continuous technological change and accelerating growth in knowledge production.

The UNESCO World Education Report (1998) notes that the new technologies challenge traditional conceptions of both teaching and learning and, by reconfiguring how teachers and learners gain access to knowledge, have the potential to transform teaching and learning processes. ICTs provide an array of powerful tools that may help in transforming the present isolated, teacher-centred and text-bound classrooms into rich, student-focused, interactive knowledge environments. To meet these challenges, schools must embrace the new technologies and appropriate the new ICT tools for learning. They must also move toward the goal of transforming the traditional paradigm of learning.

In the modern society one of the major changes in education can be described as a general shift from teaching to learning. The teacher’s role is
increasingly to assist students to become good learners. At the same time, teachers must help create stronger relationships between the subjects of study and concrete reality, putting them in a more relevant context for students. In many cases, this implies integration of disciplines and cooperation among teachers of different subject areas.

Paradigm shifts in education in recent years envisions a new type of learning culture that demands ICT integration with pedagogy. Implementing the pedagogy-technology integration in teacher development and managing the changes are highly complex and possibly one of the most challenging tasks for any teacher education institution.

**Stages of ICT Development**

ICT has to be infused into pedagogy in such a way that its uses can improve learning. The proposed model is derived from international and national studies on ICT development that have identified a series of broad stages that educational system and institutions typically proceed through in the adoption and the use of ICT. These broad stages have been termed as Emerging, Applying, Infusing and Transforming stages of ICT development (UNESCO, 2005). The model is then mapped on the basis of: (a) stages of ICT usage and (b) pedagogical usages of ICT.

Studies of ICT development in both developed and developing countries identify at least four broad approaches through which educational systems and individual institutions typically proceed in their adoption and use of ICT. Sometimes, the number of stages identified varies. However, there is a general consensus that the introduction and use of ICT in education proceeds in broad stages that may be conceived as a continuum or series of steps. These steps, termed Emerging, Applying, Infusing, and Transforming,
Emerging Stage

Institutions at the initial stages of ICT development demonstrate the emerging approach. Such institutions have just started their journey in the ICT field with a skeleton computing infrastructure either donated or purchased by the institution authority. To start with, administrators and teachers just begin to explore the possibilities and consequences of using ICT for institutional management and adding ICT to the curriculum. Institutions at this emerging phase are still firmly grounded in traditional, teacher-centred practice. The curriculum reflects an increase in learning how to acquire ICT basic skills such as office automation, e-mail and basic operation of computers, so that it prepares the ground for moving to the applying stage. In the emerging approach to ICT development, the focus is on the technical functions and uses of ICT and on the need for some knowledge and representation of the impacts of ICT on the system as a whole.
This approach often involves teachers’ personal use of ICT, such as, the use of word processing to prepare documents and spreadsheet to prepare a database, locating information on CD-ROMs or on the Internet, or communicating with friends and family by e-mail. Here, teachers are developing their ICT literacy and learning how to apply ICT to a range of personal and professional tasks. The emphasis is on training in a range of tools and applications, and increasing teachers’ awareness of the opportunities for applying ICT to their teaching in the future.

**Applying Stage**

In this second stage ICT tools are integrated into various school subjects. Administrators and teachers use ICT for tasks already carried out in institutional management and in the curriculum. Teachers largely dominate the learning environment. Institutions at the applying stage adapt the curriculum in order to increase the use of ICT in various school subjects with specific tools and software such as drawing, designing, modeling and application of specific tools. This curriculum assists the institutions to move to the next stage.

In the applying stage, teachers use ICT for professional purposes, focusing on improving their subject teaching in order to enrich how they teach with a range of ICT applications. This stage often involves teachers in integrating ICT to acquire specific subject skills and knowledge, help teachers to change their teaching methodology in the classroom, and use ICT to support their professional development.

Teachers gain confidence in a number of ICT tools that can be applied to the teaching of their subject area. The opportunity to apply ICT in all their teaching is often limited only by a lack of ready access to ICT facilities and resources.

**Infusing Stage**
At the third stage, the infusing approach involves integrating or embedding ICT across the curriculum, and is seen in those institutions that now employ a range of computer-based technologies in laboratories, classrooms, and administrative offices. Teachers explore new ways which changes their personal productivity and professional practice. The curriculum begins to merge subject areas to reflect real-world applications. In this infusing stage, ICT infuses all aspects of teachers’ professional lives to improve student learning and the management of learning processes. The approach supports active and creative teachers who are able to stimulate and manage the learning of students, integrating a range of ICT tools in achieving their goals. The infusing stage often involves teachers easily integrating different knowledge and skills from other subjects into project-based curricula.

In this approach, teachers fully integrate ICT in all aspects of their professional lives to improve their own learning, as well as, the learning of their students. Thus, they use ICT to manage not only the learning of their students but also their own learning. They use ICT to assist all students to assess their own learning in achieving specific personal projects. In this approach, it becomes quite natural to collaborate with other teachers in solving common problems and in sharing their teaching experiences with others.

Transforming Stage

In this stage, ICT becomes an integral, though invisible, part of daily personal productivity and professional practice. The focus of the curriculum is now learner-centred that integrates subject areas in real-world applications. ICT is taught as a separate subject at the professional level and is incorporated into all areas. Institutions have become centres of learning for their communities.

In the transforming approach to ICT development, teachers and other staff members regard ICT as a natural part of the everyday life of the institutions that they begin to look at the process of teaching and learning in
new ways. The emphasis changes from teacher-centred to learner centred. Teachers, together with their students, expect a continuously changing teaching methodology designed to meet individual learning objectives.

**Mapping the Model**

The continuum model can be mapped onto two interwoven tracks for the development of teachers’ capacity in harnessing ICT with regard to (a) stages of ICT usage and (b) pedagogical usages of ICT.

**Stages of ICT usage**

Studies of teaching and learning in schools around the world identify four broad stages in the use of ICT. These four stages give rise to the mapping depicted in terms of awareness, learning how, understanding how and when, and specializing in the use of ICT tools.

**Becoming aware of ICT**

In the initial phase, teachers and learners become aware of ICT tools and their general functions and uses. In this stage, there is usually an emphasis on ICT literacy and basic skills. This stage of discovering ICT tools is linked with the emerging stage in ICT development.

**Learning how to use ICT**

Following on and from the first stage comes the stage of learning how to use ICT tools, and beginning to make use of them in different disciplines or subject areas. This stage involves the use of general or particular applications of ICT, and is linked with the applying stage in the ICT development model.

**Understanding how and when to use ICT**
The next stage is to understand how and when to use ICT tools to achieve a particular purpose, such as in completing a given project. This stage implies the ability to recognize situations where ICT will be helpful, choosing the most appropriate tools for a particular task, and using these tools in combination to solve real problems. This stage is linked with the infusing stage in the ICT development model.

**Specializing in the use of ICT**

The fourth and the last stage involve specializing in the use of ICT tools which occurs when one creates and transforms the learning environment with the help of ICT. This is a new way of approaching teaching and learning situation with specialized ICT tools and is linked with the transforming stage in the ICT development model.

**Pedagogical usages of ICT**

Adoption of ICT in the classroom generally proceeds in four broad stages in the way the teachers and learners use ICT as a support to teaching and learning. These four stages give rise to the mapping that have been broadly classified as supporting work performance, enhancing traditional teaching, facilitating learning and creating innovative learning environments, according to the stages of the proposed model.

More than three decades ago, computers and related information technology were introduced to educators for direct teaching and learning purposes. ICT started its journey primarily with productivity tools, proceeded to self-learning courseware and multi-modal instruction, and finally progressed to web-based learning management system.

**Supporting work performance**
In the initial phase, teachers use productivity tools such as word processor, visual presentation software, spreadsheet, database, email etc., to support their daily work performance. During this stage, there is usually an emphasis on basic operations of electronic office software. This stage of using productivity tools for teaching and learning is linked with the emerging stage in ICT development.

*Enhancing traditional teaching*

From the productivity software, comes the stage of learning how to use and develop computer-assisted learning software in different disciplines. This stage involves the technique of integrating computer-based learning in the traditional instructional process, and is linked with the applying stage in the ICT development model. Various instructional packages were selected, developed and used to enhance traditional classroom teaching.

*Facilitating learning*

The next stage involves using various types of ICT tools to facilitate student learning. The key point is that the teachers need to learn how to choose the most appropriate tools for a particular task, and using these tools in combination to solve real life problems. This stage implies the ability to recognize situations where various multimedia and specialized software can be utilized for teaching and learning. This stage is linked with the infusing stage in the ICT development model.

*Creating innovative learning environments*

The fourth and last stage involves specializing in the use of ICT to create an innovative learning environment that transforms the learning situation. This is possible by incorporating emerging trends in pedagogy and learning principles in teaching and learning.
For this purpose, specialized software including modeling and simulation, expert systems, semantic networking etc., are employed to support pedagogical innovation. It helps to develop, deliver and manage open and flexible learning programme. This stage is linked with the transforming stage in the ICT continuum model.

**Scenario of Indian Schools**

India is emerging as the fastest-growing economy in the world. Several international reviews predicted that 21st century belongs to India and China as much as 20th century belonged to the USA, and 19th century to Europe. Such international reviews also warn lot of pitfalls and landmines on the way. The success depends largely upon human resource development. But it is observed that the education being imparted in our schools and higher education institutions, including the vast majority of our best schools and colleges, is sub-standard.

As reported in Times of India, 15th January, 2012, titled “India at the bottom of education pile”, India ranked second last among i.e. 72 out of 73 countries that participated in the programme for International Student Assessment (PISA), conducted annually to evaluate education systems worldwide by the OECD (Organisation for Economic Cooperation and Development) Secretariat. PISA assesses the skill and knowledge (reading, mathematical, problem solving and scientific literacy) students have acquired at the end of their compulsory education. The PISA sample is drawn from a population of students between 15 years and the three months and 16 years and two months who attend educational institutions and are in the equivalent to grade 7 or above. A minimum of 150 schools were selected in each country; India participated in PISA for the first time. In all, 143 schools from Tamil Nadu and 66 schools from Himachal Pradesh were covered in the PISA
assessment. The two states were considered as one entity. The province of Shanghai, which participated in PISA for the first time scored the highest in reading. It also topped in mathematics and science.

As reported by Kurrien (2007) the results of a large-scale study conducted last year from the best 142 English-medium schools in five metro cities - Bangalore, Chennai, Kolkata, Mumbai and New Delhi - 32,000 students were selected from classes 4, 6 and 8. They were administered tests to evaluate their understanding of mathematics science and English. Students fared poorly in questions testing understanding or application of knowledge to new situations. They were only able to do answer questions based on recall or standard procedures. They were simply unable to answer questions that appeared to be different from what they typically encountered in their textbooks. Whatever else our best schools may claim to be teaching, clearly most of them are failing miserably in one of their principal goals - to help students understand what is learnt, relate it to the world outside the classroom and to think critically.

*Are schools in other countries doing a better job of teaching their children?*

We have no objective basis to make any comparative judgments, as India does not participate in international studies of student achievement. However, the study on our best schools did include 11 questions on mathematics and science that were taken from an international study of 43 participating countries. The results are indicative. Class 4 students from our best schools scored lower than even the average performance of class 3 students from these 43 countries on the same 11 questions. Even though this evidence is limited, it surely indicates that there is something rotten in the state of our top English-medium schools if our best students are performing worse than average students in other countries.
A similar false consciousness exists about the quality of our elite institutions of higher education. In the recently published 2007 Times Higher Education World University rankings, not a single Indian institution featured in the top 200. Of the 26 Asian universities in this list, Japan had 11 and China 6. Hong Kong, which has less than half the population of Mumbai, had 4 universities in the top 200. (Kurrien, 2007)

As reported in the editorials of Times of India (18 December 2007) Elementary school must necessarily be viewed as a training ground for young minds. Unfortunately, in India, it is a battleground where children are forced to cram and learn by rote. It is proven that the development of cognitive abilities is not uniform among children. Their needs, interests, responsiveness necessarily differ. It is, therefore, crucial that teachers are equipped to address the specific needs of young children. It is imperative that the present one-dimensional and merely instructive flow of information — from tutor to the taught — is replaced by a more interactive system where learning is made meaningful. To that end, it does not matter if an elementary schoolteacher is a graduate or not. All that matters is that she is competent and up to the job. (It is Elementary, Editorial, Times of India, 18 December 2007)

In current scenario, institutions like NCERT, CBSE, Board of Secondary Education and SCERT of different states design the curricula, instructional methods, textbooks and other materials, which, after having a stamp of approval from ministries of education, are distributed to schools and teachers. A teacher’s duty is to read and follow closely the body of these materials in order to deliver it piecemeal to students, who are expected to memorize the content one chunk after another, and checking in to see if they succeed. The basic, though rarely announced, assumption is that teachers need not add a word to what has been
given from higher authorities. Teacher-to-student communication is predominantly oral. Visual aids are usually illustrations taken from books.

There is little hands-on activity with physical materials and tools on workbenches. The teacher is a lecturer, not a master of a craft. Little communication exists between teachers of different subjects on how to collaborate in making the educational process truly involving and effective. There is rigid timing; monologue lecturing and schools are considered as teaching institutions. The curriculum: a sum of disparate subjects.

The Traditional View of the Learning Process

The existing view of the learning process emerged out of the factory model of education at the turn of the 20th century and was highly effective in preparing large numbers of individuals with skills needed for low-skilled positions in industry and agriculture. The UNESCO Information and Communication Technologies in Teacher Education (2002) notes that the traditional educational paradigm is often characterized by the following views of learning:

**Learning is hard.** Many view learning as a difficult and often tedious process. According to this view, if students are having fun or enjoying what they are doing in a learning activity, they probably are not learning.

**Learning is based on a deficit model of the student.** The system strives to identify deficiencies and weaknesses of the student. Based on noted deficiencies, students are tracked, categorized, remediated or failed. The impact of the deficit model of student learning is most obvious in compensatory education programmes. Bruer, in his book, *Schools for Thought*, notes that research overwhelmingly concentrates on the weaknesses of poor children. Very little research has been done on their strengths. In addition, the weaknesses
identified are often deficiencies in terms of the traditional organization and content of schooling. Very little thought has been given to the idea of changing schooling to accommodate new kinds of students; all the effort has gone to changing the students so that they will fit into the schools (Bruer, 1993).

**Learning is a process of information transfer and reception.** Much of our present learning enterprise remains "information-oriented," emphasizing students reproducing knowledge rather than producing their own knowledge. It also remains teacher-centered. Many still see the role of the teacher as a dispenser of information and the role of the student as a passive receiver, storer and repeater of the transmitted information.

**Learning is an individual/solitary process.** In a study of schools in the United States, the National Assessment of Educational Progress noted that most students spend long hours working alone at their desks completing worksheets or repetitive tasks. A London Times survey of English school children indicated that students almost unanimously rejected this daily ordeal of dull and ritualistically solitary classroom activity and called for a broader and more exciting curriculum. Above all, they wanted more work allowing them to think for themselves. They wanted to design and make things, to experiment and to engage in first-hand observation. The Times reported, however, that there was little evidence of changes in the curriculum that would respond to the students’ wishes. (Resta, 1996)

**Learning is facilitated by breaking content/instruction into small isolated units.** The educational system is often geared more to categorizing and analyzing patches of knowledge than to sewing them together. Bruer (1993) notes that the technology of mass education is quite adept at "breaking knowledge and skills into thousands of little standardized, decontextualized pieces, which could be taught and tested one at a time." Neil Postman in his
book, *Teaching as a Subversive Activity*, states that our educational systems break knowledge and experience into "subjects, relentlessly turning wholes into parts, history into events without restoring continuity." (Postman, 1969)

**Learning is a linear process.** Frequently, the textbook or teacher provides only one linear path through a narrowly bounded content area or sequence of standardized instructional units. For example, in a mathematics text only one correct problem solution trail may be offered for a specific subclass of problems. However, the problems encountered in daily life (or in mathematics) seldom have only one solution path or sequence.

**New Paradigm of the Learning Process**

The UNESCO Information and Communication Technologies in Teacher Education (2002) notes that in contrast to the traditional teaching-learning paradigm, a new paradigm of the teaching-learning process is emerging, based on three decades of research in human learning, that encompasses the following views of the human learning process:

**Learning is a natural process.** The natural state of the brain is to learn, however, not everyone learns in the same way. There are different learning, perceptual and personality styles that must be considered in the design of learning experiences for the individual student. Given interesting and rich learning environments, and supportive and stimulating teachers, students will learn. Teachers have often noted that children who appear disruptive or to have short attention spans when confronted with typical classroom instruction, may spend long periods engaged in meaningful and interesting computer-related activities.

**Learning is a social process.** The communal context of knowledge and learning is beginning to be rediscovered, as evidenced by the rapid growth of quality circles and computer-supported collaborative work in business, government,
medicine, and higher education. As Vygotsky (1978) noted long ago, students learn best in collaboration with peers, teachers, parents, and others when they are actively engaged in meaningful, interesting tasks. ICTs provide opportunities for teachers and students to collaborate with others across the country and across the globe. They also provide new tools to support this collaborative learning in the classroom and online.

**Learning is an active and not a passive process.** In most fields, people are faced with the challenge of producing knowledge rather than simply reproducing knowledge. To allow students to move toward competence, they must be actively engaged in the learning process, in activities such as solving real problems, producing original writing, completing scientific research projects (rather than simply studying about science), dialoguing with others on important issues, providing artistic and musical performances, and constructing physical objects.

**Learning may either be linear or non-linear.** Much of what now happens in schools appears based on the notion that the mind works like a serial processor that is designed to process only one piece of information at a time in sequential order. But the mind is a wonderful parallel processor that may attend to and process many different types of information simultaneously.

**Learning is integrative and contextualized.** Pribram’s holistic brain theory suggests that information presented globally is more easily assimilated than information presented only in a sequence of information elements (Pribram, 1991). It is also easier for students to see relations and to make connections.

**Learning is based on a strength model of student abilities, interest, and culture.** Based on the work of Howard Gardner and others, schools are beginning to consider the specific strengths and interests that students bring to the learning environment, and are designing learning activities that build on
student strengths rather than focusing only upon remediating weaknesses. In addition, schools increasingly recognize diversity as a resource rather than a problem in the classroom.

*Learning is assessed through task completion, products, and real problem solving of both individual and group efforts.* Rather than simply evaluating students through paper and pencil tests, assessments are made using portfolios of actual performances and work in both collaborative and individual learning tasks. As noted by Driscoll (1994), we no longer can view learners as "empty vessels waiting to be filled, but rather as active organisms seeking meaning." Don Tapscott, in his book *Growing Up Digital: The Rise of the Net Generation* (1998), notes that we are entering a new era of digital learning in which we are in the process of transitioning from "broadcast" learning to "interactive" learning. Today’s students no longer want to be passive recipients in the information transfer model of learning. Rather they want to be active participants in the learning process. There is growing recognition that today’s world requires that students be able to work collaboratively with others, think critically and creatively, and reflect on their own learning processes.

**A Paradigm Shift: From Teaching to Learning**

As technology has created change in all aspects of society, it is also changing our expectations of what students must learn in order to function in the new world economy. Students will have to learn to navigate through large amounts of information, to analyze and make decisions, and to master new knowledge domains in an increasingly technological society. They will need to be lifelong learners, collaborating with others in accomplishing complex tasks, and effectively using different systems for representing and communicating knowledge to others. A shift from teacher-centred instruction to learner-centered instruction is needed to enable students to acquire the new 21st century
knowledge and skills. The following table (Sandholtz, Ringstaff, and Dwyer, 1997) identifies the shift that will take place in changing from a focus on teaching to a focus on learning.

**Table 1.1**

**Teacher-Centered and Learner-Centered Learning Environments**

<table>
<thead>
<tr>
<th>Classroom activity</th>
<th>Teacher Centered learning environments</th>
<th>Learner centered learning environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher role</td>
<td>Fact teller, Always expert</td>
<td>Collaborator, Sometimes learner</td>
</tr>
<tr>
<td>Instructional emphasis</td>
<td>Facts’ memorization</td>
<td>Relationships, Inquiry and invention</td>
</tr>
<tr>
<td>Concepts of knowledge</td>
<td>Accumulation of facts, Quantity</td>
<td>Transformation of facts</td>
</tr>
<tr>
<td>Demonstration of</td>
<td>Norm referenced</td>
<td>Quality of</td>
</tr>
</tbody>
</table>

*Teacher Centered learning environments* involves a didactic approach where the teacher is the central figure, imparting knowledge through lectures and didactic activities. In contrast, *Learner centered learning environment* focuses on active learning, where students are encouraged to explore and interact with the material, leading to a deeper understanding and transformation of facts.
success

understanding

Assessment
Multiple choice items
Criterion referenced, Portfolios and performances

Technology use
Drill and practice
Communication, access, collaboration, expression

Shifting the emphasis from teaching to learning can create a more interactive and engaging learning environment for teachers and learners. This new environment also involves a change in the roles of both teachers and students. As shown in Table 1.2 (adapted from Newby et al., 2000), the role of the teacher will change from knowledge transmitter to that of learning facilitator, knowledge guide, knowledge navigator and co-learner with the student. The new role does not diminish the importance of the teacher but requires new knowledge and skills. Students will have greater responsibility for their own learning in this environment as they seek out, find, synthesize, and share their knowledge with others. ICTs provide powerful tools to support the shift to learning centered education and the new roles of teachers and students.

Table 1.2
Changes in Student and Teacher Roles in Learner-Centered Environments
### Changes in Teacher’s Role

<table>
<thead>
<tr>
<th>A shift from:</th>
<th>A shift to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge transmitter, primary source of information, content expert, and source of all answers</td>
<td>Learning facilitator, collaborator, coach, mentor, knowledge navigator, and co-learner</td>
</tr>
<tr>
<td>Teacher controls and directs all aspects of learning</td>
<td>Teacher gives students more options and responsibilities for their own learning</td>
</tr>
</tbody>
</table>

### Changes in Student Role

<table>
<thead>
<tr>
<th>A shift from:</th>
<th>A shift to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive recipient of information</td>
<td>Active participant in the learning process</td>
</tr>
<tr>
<td>Reproducing knowledge</td>
<td>Producing and sharing knowledge, participating at times as expert</td>
</tr>
</tbody>
</table>
Learning as a solitary activity | Learning collaboratively with others

(Table adapted from one developed by Newby et al., 2000).

**Instructional Role of Information and Communication Technologies**

Information and Communication Technology alone, of course, does not produce learning; technology is a tool that can be used in many ways, to enhance learning. The literature generally describes three major categories of instructional use for computer-based technologies; these are: learning from the technology, learning about the technology and learning with the technology.

**Learning from the technology**

When technology is used to convey specific information or skills, Zucchermaglia (1991) describes it as "full" technology--full of information to be conveyed to the student. Maddux, Johnson, and Willis (1997) label applications that support this use as Type I applications, which are "designed to make it easier, quicker, or otherwise more efficient to continue teaching the same things in the same ways we have always taught them" (p. 18). Use of technology in this case mirrors traditional classroom practice: users are relatively passive, the content and interaction between the user and the software are predetermined, and there is a limited repertoire of acceptable responses. The acquisition of facts through repeated practice and rote memory, or learning from the technology (Jonassen, 1996), is the goal of instruction. This use of technology was the most prevalent one in the 1970s and 1980s (Jonassen, 1996).
"Full" or Type I technologies include computer assisted instruction, integrated learning systems, computer-based tutoring systems, assessment software, and administrative software, such as electronic grade books or attendance record-keeping software. Computer-assisted instruction and integrated learning systems have been readily adopted in many schools as they closely match the traditional routine of classroom life. McClintock (1992) points out that technology has often been used as a replacement for existing tools, such as books, rather than as an alternative medium through which different tasks might be performed and different objectives might be achieved. Some researchers (Vockell and Schwartz, 1992; Merrill, Tolman, Christensen, Hammons, Vincent, and Reynolds, 1986) suggest that computer-assisted instruction can increase achievement because it leads to automaticity of lower-level skills through extended practice. A computer that is endlessly patient with the learner monitors this practice. In the tutorial form of computer-assisted instruction, the computer provides additional information to the learner if an incorrect answer is supplied. This continues until the learner is successful.

Hundreds of research studies have been conducted regarding the effects of computer-assisted instruction (CAI). From his analysis of twelve meta-analyses of the effectiveness of computer-based instruction programs developed primarily prior to 1990, Kulik (1994) concludes that students usually learn more and in less time with computer-based instruction. Becker (1992), however, found numerous methodological problems with many studies that have demonstrated positive effects of using CAI. In his meta-analysis of 100 studies, he concludes that differences in CAI users and non-users are too small to have educational significance.

Learning about the technology
Another use of technology in schools that exemplifies traditional learning environments includes learning about the technology itself (Jonassen, 1996). Classes in computer programming and computer literacy are designed to teach students how computers work. Students learn specific skills related to using the computer, such as keyboarding skills, ethical uses of computers, or a particular programming language, but these skills are not tied to other content. These classes were prevalent in the 1980s, but Jonassen (1996) observes that this use of technology is now less emphasized in schools. He attributes the change to:

- the increasing availability of computers in society that gives students more experience with them outside of schools;
- the understanding that one does not have to know how a computer works to take advantage of it as a tool; and the
- emphasis on memorizing vocabulary about computers in computer literacy classes, which had little applicability to educational goals of schools.

**Learning with the technology**

Learning with technology drives much of the current thinking about the use of technology to support learning (Jonassen, 1996). Bonk, Hay, and Fischler (1996) note, "Currently popular ideas about students using electronic tools to be designers of knowledge are akin to Dewey's arguments that children must actively construct and interrelate knowledge by learning in more authentic ways" (p. 95). According to this perspective, when technology becomes an integral part of the classroom learning environment it provides a tool for both teachers and students that can facilitate new roles and new instructional strategies.
Technology used as a tool can serve as a means to seek and process information, and to reflect on one's understandings, beliefs, and thinking processes. Used in this way, technology is "empty" as it allows the learner to enter information and explore new content relationships (Zucchermaglia, 1991). Ordinary application software such as word-processing, spreadsheet, graphics, presentation, and database software; problem-solving software; simulations; electronic mail; and the Internet are technology tools that fit into this category. These applications, labeled Type II by Maddux et al. (1997), give the user control of almost everything that happens, including the interaction between the user and the machine. An extensive repertoire of acceptable responses is provided for. Rather than rote memorization of facts, Type II applications encourage the accomplishment of creative, higher-level tasks (Maddux et al., 1997).

Because of the interactive nature of technology and the power of its information-processing capabilities, Jonassen (1996) proposes that when students learn with technology, it becomes a "mindtool." He defines mindtools as "computer-based tools and learning environments that have been adapted or developed to function as intellectual partners with the learner in order to engage and facilitate critical thinking and higher-order learning" (p. 9). Using commonly available software (databases, spreadsheets, electronic mail, multimedia, hypermedia, and others), learners employ technology to both construct and represent knowledge.

Information and Communication Technologies in Teaching and Learning

The instructional implications of information and communication technologies are mostly based on Constructivist theory -- based on observation and scientific study -- about how people learn. It says that people construct their own
understanding and knowledge of the world, through experiencing things and reflecting on those experiences

Constructivism transforms the student from a passive recipient of information to an active participant in the learning process. Always guided by the teacher, students construct their knowledge actively rather than just mechanically acquiring knowledge from the teacher or the textbook. Students become engaged by applying their existing knowledge and real-world experience, learning to hypothesize, testing their theories, and ultimately drawing conclusions from their findings.

**Changing roles of student, teacher and community**

*Students as Teachers*

The age of the teacher as the primary source of knowledge in the classroom is gone. Today, with the universe of experts and information available through the Internet, students can access new and relevant information not yet discovered by their teacher. Internet-using educators are discovering a new mode of learning that we call "Side-by-side learning." It is becoming a more and more common experience to find students assuming both informal and formal roles as teachers of their peers and younger students, and in many cases of teachers.

*Teacher as coaches*

Teachers who involve their students in project-based learning activities also find their own role logically and naturally changing. Rather than being simple dispensers of knowledge, they discover their primary tasks are to guide and coach and mentor their students. They teach their students how to question, and how to develop hypotheses and strategies for locating information. They become co-learners as their students embark on a variety of learning projects, which chart unfamiliar territory.
Community as guide and mentor

With the growth of the World Wide Web, more and more of "the community" can be found online, therefore permitting closer relationships between people inside schools and outside in the "real world". Parents, business leaders, scientists, political leaders and administrators, and many other members of the community can play more effective and innovative roles as motivators, role models, sources of information, critics, evaluators, guides, and mentors.

The changing role of teacher in ICTs based interactive learning

In the traditional teaching learning situation, the relation between the teacher and the pupil is frontal –the role of the teacher is to deliver knowledge to the pupil. There is some co-operation among pupils. Teachers do not possess adequate knowledge and skills for the effective exploitation of ICTs. In many cases teachers are less expert than their pupils. Further, teachers find themselves in a situation where they are no longer the principal source and deliverer of information. In this context, teachers need to be properly trained for developing pupils’ learning abilities. The skills needed how to use computers as tools for learning i.e. develop a critical mind; how to make lines among different sources and types of information; and how to help pupils to construct their knowledge with ICTs.
For effective education, it is essential that there be more opportunities for student participation in the learning process, more team work, more self-study
and self-evaluation, as well as more peer evaluation and less examination oriented teaching and learning. It is felt that ICTs can assist in promoting more student centered and interactive learning.

The new technologies have enormous potential to revolutionize education. It is obvious that the monopolies enjoyed by schools as formal education providers will diminish.

What the teacher has to do in a learning centered classroom?

Teacher has to use many techniques in the teaching process. For example, he may:

- prompt students to formulate their own questions (inquiry)
- allow multiple interpretations and expressions of learning (multiple intelligences)
- encourage group work and the use of peers as resources (collaborative learning)

The literature suggests that technology can support constructivist learning environments when technology is used as a tool for learning, rather than the object of instruction or as the instructor, it can assist the teacher to uncover students’ prior knowledge, understanding and beliefs; base instruction on the posing of problems; increase the complexity of the context; take on the role of the facilitator; increase the ability of students to test multiple scenarios and thus challenge preconceived notions and misconceptions: and, broaden the circle of social interaction to include students’ peers and experts beyond the classroom, the school, the community and even their own country.

In a constructivist learning environment technology plays an acknowledged and purposeful role in the day-to-day activities, but does not become the object of
instruction (McClintock, 1992). According to its advocates, this environment can provide students with a complex laboratory in which they can observe, question, practice, and validate knowledge. The following discussion examines how technology can be used to support the creation of classroom environments based on the instructional implications of constructivist learning theory. This discussion is based on the premise that it is learning with, not from or about, technology that makes computer-based technologies important tools in a constructivist learning environment.

**A Frame Work of Integration**

At the heart of good teaching with technology are three core components: content, pedagogy, and technology, along with the relationships among and between them. The interactions among the three components, account for the wide variations seen in the extent and quality of educational technology integration. These three knowledge bases (content, pedagogy, and technology) form the core of the technology, pedagogy, and content knowledge (TPACK) framework (Koehler & Mishra, 2008; Mishra & Koehler, 2006). The framework describes how teachers’ understandings of technology, pedagogy, and content can interact with one another to produce effective discipline-based teaching with educational technologies. In this framework (see Figure 1), there are three interdependent components of teachers’ knowledge: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK).

**Figure-1**
Content Knowledge (CK)

Content knowledge (CK) is teachers’ knowledge about the subject matter to be learned or taught. As Shulman (1986) noted, this knowledge would include knowledge of concepts, theories, ideas, organizational frameworks, knowledge of evidence and proof as well as established practices and approaches toward developing such knowledge. In the case of art appreciation, such knowledge would include knowledge of art history, famous paintings, sculptures, artists and their historical contexts, as well as knowledge of aesthetic and psychological theories for evaluating art. Not having a comprehensive base of content knowledge can be prohibitive. For example, students can receive incorrect information and develop misconceptions about the content area (National Research Council, 2000).
Pedagogical Knowledge (PK)

Pedagogical knowledge (PK) is teachers’ deep knowledge about the processes and practices or methods of teaching and learning. They encompass, among other things, overall educational purposes, values, and aims. A teacher with deep pedagogical knowledge understands how students construct knowledge and acquire skills and how they develop habits of mind and positive dispositions toward learning. Pedagogical knowledge requires an understanding of cognitive, social, and developmental theories of learning and how they apply to students in the classroom.

Pedagogical Content Knowledge (PCK)

PCK is consistent with and similar to Shulman’s (1986) idea of knowledge of pedagogy that is applicable to the teaching of specific content. Central to Shulman’s conceptualization of PCK is the notion of the transformation of the subject matter for teaching. According to Shulman (1986), this transformation occurs as the teacher interprets the subject matter, finds multiple ways to represent it, and adapts and tailors the instructional materials to alternative conceptions and students’ prior knowledge. PCK covers the core business of teaching, learning, curriculum, assessment and reporting, such as the conditions that promote learning and the links among curriculum, assessment, and pedagogy.

Technology Knowledge (TK)

Technology knowledge (TK) is always in a state of flux. The definition of TK used in the TPACK framework is close to that of Fluency of Information Technology, as proposed by the Committee of Information Technology Literacy of the National Research Council (NRC, 1999). Fluency of Information Technology, therefore, requires a deeper, more essential understanding and mastery of information technology for information processing, communication,
and problem solving than does the traditional definition of computer literacy. Acquiring TK in this manner enables a person to accomplish a variety of different tasks using information technology and to develop different ways of accomplishing a given task.

Technological Content Knowledge (TCK)

TCK is an understanding of the manner in which technology and content influence and constrain one another. Teachers need to master more than the subject matter they teach. They must also have a deep understanding of the manner in which the subject matter (or the kinds of representations that can be constructed) can be changed by the application of particular technologies. Teachers need to understand which specific technologies are best suited for addressing subject-matter learning in their domains and how the content dictates or even changes the technology or vice versa.

Technological Pedagogical Knowledge (TPK)

TPK is an understanding of how teaching and learning can change when particular technologies are used in particular ways. This includes knowing the pedagogical affordances and constraints of a range of technological tools as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies. To build TPK, a deeper understanding of the constraints and affordances of technologies and the disciplinary contexts within which they function is needed. For example, consider how whiteboards may be used in classrooms. Because a whiteboard is typically immobile, visible to many, and easily editable, its uses in classrooms are presupposed. Thus, the whiteboard is usually placed at the front of the classroom and is controlled by the teacher. An understanding of the affordances of technology and how they can be leveraged differently according to changes in context and purposes is an important part of understanding TPK.
TPK becomes particularly important because most popular software programs are not designed for educational purposes only. Software programs such as the Microsoft Office Suite (Word, PowerPoint, Excel, and MSN messenger) are usually designed for business environments. Web-based technologies such as blogs or podcasts are designed for purposes of entertainment, communication, and social networking.

Thus, TPK requires a forward-looking, creative, and open-minded seeking of technology use, not for its own sake but for the sake of advancing student learning and understanding.

Technology, Pedagogy, and Content Knowledge

Technological & pedagogical content knowledge is an understanding that emerges from interactions among content, pedagogy, and technology knowledge. Underlying truly meaningful and deeply skilled teaching with technology, TPACK is different from knowledge of all three concepts individually. Instead, TPACK is the basis of effective teaching with technology, requiring an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students’ prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones.

By simultaneously integrating knowledge of technology, pedagogy and content, expert teachers bring TPACK into play any time they teach. Each situation presented to teachers is a unique combination of these three factors, and accordingly, there is no single technological solution that applies for every teacher, every course, or every view of teaching. Rather, solutions lie in the
ability of a teacher to flexibly navigate the spaces defined by the three elements of content, pedagogy, and technology and the complex interactions among these elements in specific contexts.

Thus, teachers need to develop fluency and cognitive flexibility not just in each of the key domains (Technology, Pedagogy, and Content), but also in the manner in which these domains and contextual parameters interrelate, so that they can construct effective solutions.

The TPACK framework suggests that content, pedagogy, technology, and teaching/learning contexts have roles to play individually and together. Teaching successfully with technology requires continually creating, maintaining, and re-establishing a dynamic equilibrium among all components.

Impact of Collaboration in Technology Based Collaborative Learning

The impact of collaboration in technology based collaborative learning environments on study performance and nature and quality of knowledge construction has been studied during four subsequent years (Schellens, 2004; Schellens and Valcke, 2000, 2002, Schellens, Van Keer, and Valcke, 2004a, 2004b, reported by Valeke, M. et al. 2005)

In the first study, 300 of 850 freshman students studying psychology and educational sciences participated. They worked four months in 38 asynchronous discussion groups on authentic task and problems in which they applied the theoretical base of different instructional theories. Group size was manipulated this study. The complete transcripts of nine groups were analyzed to determine levels of knowledge construction reflected in these messages. The results of this study confirm the task related nature of the group communication. Building on the hypothetical hierarchical nature in the levels of knowledge construction, the results further reveal higher proportions of phases of knowledge construction in
all groups. As to the group size, smaller groups (8-10 students) reached significantly higher levels of knowledge construction than average size (11-13) and large groups (15-18).

In a subsequent study, 230 freshmen worked in 23 asynchronous discussion groups as a formal part of their curriculum. Group size was constant in this study (10 per group) and the focus was on determining the impact of task structure (Global task versus pre-structured task) and participation levels (three levels, based on the number of observed contributions in the group discussions) on construction. Complete transcripts of eight randomly selected discussion groups were analyzed. The results again confirm the highly task oriented nature of the discussions. Discussions in more actively engaged groups (reflecting the highest participation level) show significantly higher level of knowledge construction. The findings also hint at a significant impact of task structure. More complex tasks foster higher levels of knowledge construction.

In the third study, with 286 students, multi-level analysis was applied to determine the impact of individual student characteristics (i.e., positive attitude towards collaborative learning; deep, surface, or strategic learning style; participation level). And task characteristics (i.e., role assignment, task complexity) on two dependent variables, namely level of knowledge construction and study performance. To determine the level of knowledge construction, the same models were applied to code the transcripts as in the second study. With respect to the in-depth exploration to the task environment, task complexity (availability of conceptual base and availability of a solution procedure) was measured and considered to have a differential impact.

The results of this study point at the impact of task complexity. When tasks are too complex, the levels of knowledge construction are significantly lower. On the other hand, when the tasks are too straightforward, the number
and quality of constructions drop significantly. The results confirm the earlier findings that a task should be in the learners’ zone of proximal development (Schellens et al., 2004a; Quinn, 1997). With respect to the impact of roles, only the role of the ‘summarizer’ resulted in significantly higher levels of knowledge construction. Considering the results of the multi-level analysis dealing with student, group, and task variables, a large part of the overall variance in students’ level of knowledge construction can be attributed to differences between the various discussion themes and tasks. As to the impact of student characteristics, the amount of individual contributions and students’ attitude towards the online learning environment are significant predictors of students’ mean level of knowledge construction.

The findings of the above studies are largely in line with the results of studies that fit into the long tradition of collaborative and cooperative learning research. The research results reveal that task structure is an important issue to consider for developers of such environments. A careful balance should be respected between open and closed structure of discussion. Along with task structure, task complexity is also a significant factor. Tasks should not be too complex as students’ motivation might decline. It implies that students are capable of seeing that they can complete the activity that is within their zone of proximal development. On the other hand, when tasks are too straightforward, we might expect that students experience no challenge and that the quality of contributions also drops. It appears that challenge is an important concept in this context. In order to keep the learning in this zone of proximal development, focus should be laid on structuring of assignment. Another practical implication is that task should be enjoyable.

These strategies are consistent with constructivist approaches to learning and instruction to foster engagement in an online learning environment. Present
achievable goals and clear evaluation criteria, organize authentic learning, and set tasks at the appropriate level of complexity.

**Conclusion**

It may be concluded that it is learning with, not from or about, technology that makes computer based technology an important tool in a new paradigm of learning. In order to capitalize on the potential of new technology, and particularly digital technology as a teaching tool there is an urgent need of the professional development of teachers. Professional development that allows teachers to construct professional knowledge about pedagogy, content, and technology, as well as strategies for managing the changing classroom environments brought about with the creation of constructivist learning environments supported by technology. To achieve this, there is need of providing learning experiences to the teachers. These experiences should be situated in an authentic context for teachers, 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. By providing such learning experiences to the teachers, we can enable them to create learning experiences appropriate for the children of the Information Age and take the advantage of Information and Communication Technologies in a new paradigm of learning.

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Financing of British Universities: What India can Learn

Prof. Mohd. Muzammil

England is the earliest home of modern higher education. The world famous universities of Oxford and Cambridge are situated in England. Almost all learned scholars in yester years in India received their education in England and a few of them also taught there. Even today it is the most favourite destination of Indian students seeking specialized knowledge and training. They also enjoy the social and cultural milieu of the British society. The universities are run so well without much written rules of governance, that anybody may feel envious of the same. It is said that universities like Oxford and Cambridge are run by their own noble traditions.

The development of Indian higher education also owes its origin to the English pattern. While the academic structure was almost copied in toto but the funding pattern of Indian universities after the Independence of the country could not develop on the same lines as in England. Opinions are often expressed that the colonial legacy in higher education is still looming large on the minds of academicians that needs to be done away with. This opinion was aired recently among participants of a conference as a widely shared feeling in erstwhile British colonial countries. The Conference was held in June 2011 in Malaysia on this very theme ‘Decolonising our Universities’ from the colonial academic hangover. In fact, the British experience has seldom been looked into when changes or modifications were attempted in the pattern of financing of higher education in India. There would be no denying that there is much to learn from the experience of the funding of higher educational institutions (universities and colleges) in England.

The relative enrollment ratio in higher education is very high in England as compared to India. As per Browne Report (2010), the Gross Enrollment Ratio (GER) in higher education in England is now 45 percent up from 39 percent a decade ago. Providing quality education to this large number of people is an enormous task. The Government of England is striving hard through governance reforms and restructuring the financing system of the

10 Vice-Chancellor, M.J.P. University, Bareily, U.P., Former Head, Department of Economics, University of Lucknow. Email: prof.muzammil@gmail.com
universities to set things right and deliver quality education to the ever increasing number of students.

Universities and higher education institutions receive funding from different sources. The two main sources are the public sources and the private sources. The main funding of universities is England is done by Higher Education Funding Council for England (HEFCE; hereinafter referred to as the Council). Council grant being the most important source of income to universities, tuition fees provide the second vital source of financing teaching activities. The Research Councils also provides funding for research projects and some postgraduate students in universities. The Research Councils themselves are funded by the Department for Innovations, Universities and Skill (DIUS) and other Government Departments.

The following are broad aims of the Council:

- Increase opportunities for students from all types of backgrounds to benefit from higher education
- Maintain and enhance the quality of teaching and research
- Encourage universities and colleges to work with business and the community
- Support diversity
- Encourage efficiency in the use of public funding
- Provide stability in funding from year to year

As against the long time consuming process in India, the Council in England starts the process of allocating grants in the month of March every year for teaching and research grant for the academic year beginning from 1st August to 31st of July of the following year. The practice in India is that grants for universities and colleges are usually made for the fiscal year from 1st April to the 31st of March of the following year.

In England, the grants are made on the basis of the following three criteria:

- Number and type of students
- Subjects taught and
- Amount and quality of research undertaken

What is important to be noted is that of the three criteria mentioned above, only one is quantitative indicator and the other two are quality indicators.
This is one of the important reasons that in England grants can ensure better results and quality improvement in higher education.

Once the amount of funding is decided by the HEFCE for any institution it is given in the form of a Block Grant. Block Grant is used by the institution concerned in the manner they decide according to their own priorities within the broader guidelines of the Council. The recipient institution is free to distribute this grant internally and spend it in ways that it supports teaching, research and other activities.

The Council is usually concerned only with overall teaching and research quality and does not intervene in other matters. The teaching funding method of grants by the Council was last revised in 1997-98 and further revision was taken up by a Survey in 2005; and the second consultation was done in 2007. This has brought in changes to the teaching funding method since 2008-09. The review thus made has set the public expenditure level for the next three years i.e. up to 2010-2011. The next review of the method of grants by the Council would thus become due thereafter.

The Council also acts as an Advisory Body and advises the Secretary of State (Department of Innovation, Universities and Skills) on the funding needs of higher education in England. The actual funding for higher education is decided by the Government and voted upon by the Parliament. On the other hand in India, often the education budget is passed without discussion and just by raising hands in the Parliament or the State Assemblies. The broad policy guidelines to the Council are provided by the Secretary of State of the DIUS.

The area of operation of the Council is very large. As in 2008-09, it undertook the funding of 129 Higher Education Institutions (HEIs) and 124 further education colleges (FECs) that provide higher education in England. The Council provides funding to further education colleges for various courses like first degree courses of BA, BSc, BEd etc., Postgraduate, Professional, Diploma and Certificate courses.

The annual funding cycle of the Council provides funding for teaching research and other activities in universities and colleges. The amounts of funding provided by the council for 2008-09 are given in Table - 1.
Table 1

Composition of higher education funding 2008-09

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount in millions of GBP</th>
<th>As Percent of the total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching</td>
<td>4,632</td>
<td>62.0</td>
</tr>
<tr>
<td>Research</td>
<td>1,460</td>
<td>19.5</td>
</tr>
<tr>
<td>Business and Community Engagement</td>
<td>120</td>
<td>1.6</td>
</tr>
<tr>
<td>Special Funding</td>
<td>337</td>
<td>4.5</td>
</tr>
<tr>
<td>Earmarked Capital Funding</td>
<td>902</td>
<td>12.1</td>
</tr>
<tr>
<td>Additional funding for very high cost and vulnerable science subjects</td>
<td>25</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7,476</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: HEFCE( 2008

These grants (as shown in Table 1), are distributed to universities and colleges on the basis of set formulae which are published by the Council so that the institutions may also check the process and the final outcomes. The formulae take into account the volume and mix of individual institution’s teaching and research.

In distributing funds the Council aims to meet the needs of students, employers and the nation by promoting higher quality teaching. Since the overall budget is set by the government, the Council cannot raise or reduce the total amount of funding meant for universities and colleges.

The funding method of the Council is designed to have the following features:

1. Transparency: the funding method is clear and public and the accounts submitted by institutions are subject to audit and made public
2. Predictability: the funding is so clearly based on formulae that institutions can easily predict the amount of funding they are likely to receive from the Council
3. Fairness: Differentiation in funding of institutions is based on justifiable reasons that can be explained easily.
4. Efficiency: the funding method does not impose administrative burden of the institutions receiving the grant.
5. Flexibility: the method of funding is flexible enough to respond in a strategic manner to external policy changes or to the developments in the policy of the Council itself.

The government in England expects that teaching and learning to be financed both by public sources (Council grants) and by those who benefit most directly from it – students themselves though the tuition fees that they pay and increasingly, employers. Full time undergraduate students may receive assistance with their tuition fees. Post graduate students pay fees mostly from their own funds. Students from outside the European Union (EU) are generally expected to meet the full cost their courses. It is the combination of these different sources of income that can ensure adequate financing for higher education in England.

The calculation of Council’s grant goes through four stages:

- **Stage I:** *Standard Resource* is calculated for each institution. It is based on the profile of students and takes into account the following: (i) Number of students, (ii) Subject related factors, and (iii) London weighting. This calculation of standard resource for each institution provides a notional benchmark.
- **Stage II:** *Assumed Resource* of the institution is calculated. This is based on the teaching grant of the previous year. It is adjusted for various factors like inflation, tuition fees etc.
- **Stage III:** The Council compares the *Standard resource* and the *Assumed resource* of the institutions and works out the percentage difference between them.
- **Stage IV:** If the difference is no more than (+/-) 5 percent, then the Council carries forward the same grant to the next year. This plus or minus 5 percent margin is called the *tolerance band* and is the means by which Council ensures that the institution receive similar resources for similar activities. For institutions outside the tolerance band, their grant and/or students’ number need to be adjusted so that they move to within the *tolerance band*.

The *tolerance band* gives the institutions a type of flexibility and it also minimizes the burden of accountability. This flexibility allows the institutions to
change the number and mix of students and change the provision (of courses etc) given to students without financial implications. It is for this reason that the principle of funding method has been ‘to have similar resources for similar activities’ and not the same resources for the same activities. This broad brush approach to funding helps to keep the accountability burden lower than might otherwise be the case.

The institutions can also apply for additional fully funded students’ places to the Council and additional grants which the Council does process through the Strategic Development Fund (SDF). As for 2008-09, the Council provides for 16,700 fully funded students places in HEIs in England. Further, there are targeted allocations made by the Council for supporting additional students in addition to mainstream teaching funding.

In addition to regular teaching funding, there are targeted allocations made by the Council for specific purposes. The targeted allocations are meant for protecting the vulnerable features of higher education in England. These are provided outside the mainstream teaching grants in accordance with key policy initiatives. These allocations also fall outside the tolerance band calculations. This means that changes in student profile will have a much more direct and immediate effect upon grant levels. The new system makes it easier for the institutions to determine how much of their grant is associated with a particular policy initiative of the government implemented though the Council.

Targeted allocations are meant for various purposes. These are detailed out in Table 2 which also lays down the amount of allocation for the year 2008-09 under targeted allocation to institutions of higher education in England.

Table 2
Funding through Targeted Allocations 2008-09

<table>
<thead>
<tr>
<th>Heads/Items</th>
<th>Total allocation in GBP in Millions for 2008-09</th>
<th>Qualifying Instituions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Allocations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widening participations</td>
<td>364 (72.8)</td>
<td>HEIs and FECs</td>
</tr>
<tr>
<td>Foundation Degrees</td>
<td>24 (4.8)</td>
<td>HEIs and FECs</td>
</tr>
<tr>
<td>Part time</td>
<td>43</td>
<td>HEIs and FECs</td>
</tr>
<tr>
<td>undergraduates</td>
<td>(8.6)</td>
<td>HEIs and FECs</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------</td>
<td>---------------</td>
</tr>
<tr>
<td>Accelerated and intensive provision</td>
<td>69 (13.8)</td>
<td>HEIs and FECs</td>
</tr>
<tr>
<td>TOTAL VARIABLE ALLOCATIONS</td>
<td>500 (100.0)</td>
<td>HEIs and FECs</td>
</tr>
</tbody>
</table>

Fixed Allocations

| Old and Historic Buildings | 41 (31.3) | HEIs only |
| Institution Specific costs | 59 (45.0) | HEIs only |
| Non Exempt students in strategically important and vulnerable subjects | 31 (23.7) | HEIs and FECs |
| TOTAL FIXED ALLOCATIONS | 131 (100.0) | HEIs and FECs |

Source: same as in Table 1

Note: HEIs- Higher Education Institutions; FECs- Further Education Colleges

Table 2 shows that of the targeted allocations, GBP 631 Millions, 79 percent allocation is for variable allocation and 21 percent is for the fixed allocation.

The Council has also drawn up a funding agreement with each institution that it funds. The funding agreement requires the institution to:

- Remain within or move towards tolerance band
- Meet certain students full time equivalent targets relating to allocations for additional students
- Meet the same targets for students to specialized courses

The outlook for future is beset with additional money being mobilized in the form of fee hikes. The British system of higher education is all set to embark upon a big jump in fee rates from 2012. Very recently, in 2011, the Government of England has released a Higher Education White Paper which puts ‘students at the heart of the system’. Interestingly the proposal which situates students at the Centre placed more financial load on them. The White Paper addresses four issues, the first of which is ‘Reforming the Funding of Universities’. The other three points included are: (a) Delivering a better student...
experience, (b) Enabling the universities to increase social mobility, and (c) Reducing regulations and reducing barriers for new providers.

Table 3

Students and Fees in England 2012-13

<table>
<thead>
<tr>
<th>Number of students in Universities</th>
<th>85,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of high performing students</td>
<td>65,000</td>
</tr>
<tr>
<td>Number of places to reward universities and colleges that combine good quality with value for money (at low fee)</td>
<td>20,000</td>
</tr>
<tr>
<td>Fees in GB Pounds</td>
<td>7,500 or less per year</td>
</tr>
<tr>
<td>Minimum fees, basic threshold (from Autumn 2012) for all institutions in GB Pounds</td>
<td>6,000 per year</td>
</tr>
<tr>
<td>Maximum charge of fees in GB Pounds</td>
<td>9,000 per year</td>
</tr>
<tr>
<td>Grades of Students for admission in university (to improve quality)</td>
<td>AAB or above at A level</td>
</tr>
</tbody>
</table>

Source: Based on the White Paper (2011)

The government of England is not thinking in terms of reducing the number of students or reducing per student expenditure as the universities are having less funds but the government is determined to improve funding so that students do not suffer. The recommendations of the White Paper are based on the Lord Browne Review Panel Report constituted in 2009 by the Government of England. The Browne Report noted that financing of higher education in England would be made more students centric and they would be able to return the money on their education as they start earning. It also noted that 40 percent top earners will pay back all charges paid on their behalf by Government upfront. While those students who are not able to earn more will be given relief in returning the money as 20 percent of the low earners would be paying back less. The Review Panel also estimated that return to graduates would be as high as 400 percent on an average.

The funding proposal of the Browne Review Report is based on the following six principles:

- More investment should be available for higher education
Student choice should be increased
Every one who has the potential should be able to benefit from higher education
No one should have to pay until they start to work
When payments are made they should be affordable
Part time students should be treated same as full time students for the costs of learning

The Browne Report has also suggested a system of learning, living and earning & paying. This is explained in the following Table-4.

Table 4
The Matrix of Learning, Living, Earning and Paying

<table>
<thead>
<tr>
<th>Head</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LEARNING</strong></td>
<td>Students choose where they want to study and what they want to study.</td>
</tr>
<tr>
<td></td>
<td>Government pays the costs of learning upfront.</td>
</tr>
<tr>
<td><strong>LIVING</strong></td>
<td>Support for living costs available to all through an annual loan of GBP 3,750.</td>
</tr>
<tr>
<td></td>
<td>No means testing for access to loans for living costs.</td>
</tr>
<tr>
<td></td>
<td>Additional support for students from families with an income below GBP 60,000</td>
</tr>
<tr>
<td></td>
<td>per year up to GBP 3,250 in grants</td>
</tr>
<tr>
<td><strong>EARNING AND PAYING</strong></td>
<td>Students pay nothing upfront. Graduates only make payments when they start earning above GBP 21,000 per year</td>
</tr>
<tr>
<td></td>
<td>Payments are affordable- 9% of any income above GBP 21,000</td>
</tr>
<tr>
<td></td>
<td>If earnings drop, then payments drop. If graduates stop work, payments stop.</td>
</tr>
<tr>
<td></td>
<td>The payment threshold is reviewed regularly to bring it into line with growth in earnings.</td>
</tr>
<tr>
<td></td>
<td>The interest rate on loans is the low rate that government itself pays on borrowing money. There is a rebate for low earners.</td>
</tr>
<tr>
<td></td>
<td>Any balance remaining after 30 years is written off.</td>
</tr>
</tbody>
</table>

Source: Based on Brown Report
The Browne Panel also calculated the details of the payments due by the graduate earnings on monthly and weekly basis. This is given in the following Table:

### Table 5

Payments due by Graduate Earnings (in GB Pounds)

<table>
<thead>
<tr>
<th>Earnings</th>
<th>Monthly</th>
<th>Weekly</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gross income</td>
<td>Payment</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21,000</td>
<td>1,750</td>
<td>30</td>
</tr>
<tr>
<td>25,000</td>
<td>2,083</td>
<td>68</td>
</tr>
<tr>
<td>30,000</td>
<td>2,500</td>
<td>143</td>
</tr>
<tr>
<td>40,000</td>
<td>3,333</td>
<td>218</td>
</tr>
<tr>
<td>50,000</td>
<td>4,167</td>
<td>293</td>
</tr>
<tr>
<td>60,000</td>
<td>5,000</td>
<td></td>
</tr>
</tbody>
</table>


On the whole, the outlook for the funding of universities in England is student finance oriented with gradually reduced support from government. The White Paper concludes:

- The proportion of funding for teaching provided by direct grant from Higher Education Funding Council for England (HEFCE) will decline, and the proportion from graduate contributions supported by subsidized loans from government, will increase.
- The HEFCE will remain responsible for allocating the remaining teaching grant to support priorities in specialized courses (like medicine and engineering) which cannot be covered through incomes from graduate contribution alone. A new system if likely to be invented by the HEFCE from 2012-13.

The issue of financial governance will become more important as the system is more open to private providers and all sorts of entry barriers are removed. The new system of funding of the universities in England focuses on greater accountability of the university to student as well as to the tax payer. The system of higher education in England is designed to promote the role of students in academic reviews. The new provisions confer more powers to students to hold universities to account. In developing countries like India removal of corruption appears to be most important element of improving
financial accountability. Needless to say, corruption is pervasive in the university system as well.\textsuperscript{vi} Incorporating objectivity in financial allocations and utilization will also help in mitigating the prevailing corruption in the university system.

The National Knowledge Commission (NKC) in India has also pointed out the need for improving governance of higher education. It has underlined the fact that Indian system of higher education is ‘over-regulated but under governed’. It has also opined to raise fee. If foreign universities come to India, the fee rates will surely go up (Muzammil: 2010c) The NKC notes that it is for the universities to decide the level of fees but as a norm fees should meet at least 20 percent of total expenditure in universities. The Commission also suggested that to safeguard the interest of poorer students, there should be fee waivers and scheme of scholarships to help them. At the same time the UGC should not penalize by reducing grants to those universities that are able to raise more resources through fees.

It may be concluded that the philosophy underlying the funding of higher education in England is that public funding has to be reduced and the beneficiaries of higher education should need to make a larger contribution towards its costs. Developing countries including India will not be too far behind. In view of the resource crunch and continuously declining strength of regular teaching staff in universities in India, if the university system has to survive and be able to better compete in the modern world, financial restructuring would be needed and then surely the British experience will be a good guide along with the national mandate on higher education.

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References


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\[1\] For an excellent summary of the arguments and proceedings of the Conference see (Ramani:2011)

\[2\] Browne Report (2010) is the Lord Browne Panel Report: SECURING A SUSTAINABLE FUTURE FOR HIGHER EDUCATION: AN INDEPENDENT REVIEW OF HIGHER EDUCATION FUNDING AND STUDENT FINANCE, October 2010. The Review Panel was constituted under the chairmanship of John Browne in 2009

\[3\] Examples of this type of voting without discussion on budget proposals are abound in the State Assembly in Uttar Pradesh. And virtually same is the case with the national Parliament where attendance of members is very thin when budget proposals for a particular ministry is being discussed and passed. Vide for details: (Kingdon and Muzammil 2009)

\[4\] There were students’ protests in London in November 2011 against the proposed fee hikes. More than 2000 students participated in the march against fee hikes. The students were raising slogans “No ifs, No buts, No education cuts” for details, vide (Times of India: 2011)

\[5\] White Paper on Higher Education - HIGHER EDUCATION: STUDENTS AT THE HEART OF THE SYSTEM Presented to Parliament by the Secretary of State for Business, Innovations and Skills (BIS) Dr. Vince Cable MP, by Command of Her Majesty, June 2011. The document is priced at GBP 20.50 The White paper is also signed by the Minister for Universities and Science Mr. David Willetts MP

\[6\] Developing countries are plagued by corruption in the university system. In a review article the summary of corruption prevailing in higher education is presented in (Muzammil: 2010b)