A STUDY ON IMPLEMENTATION OF TECHNO-PEDAGOGICAL SKILLS, ITS CHALLENGES AND ROLE TO RELEASE AT HIGHER LEVEL OF EDUCATION

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Abstract: Techno-pedagogical skills are the ways to make accessible and affordable quality education to all. The NCF (2005), and XII five year plan (2011), emphasized to provide connectivity, valuable content and low cost computing devices to all the Institutions of higher learning in the country. This hybrid skill facilitates to enhance linguistic abilities, to sketch specific pedagogy with advance study materials, to design multi-grade instruction. In higher education, techno-pedagogical skills facing some challenges such as: destitute infrastructure of ICT, scarce competence on English language and online content, calamity, and lack of incentives and awareness of teachers, evils on research and development, hitch of using software, limited techno-pedagogical resources, lack of coordination among the departments, frequent power outages and fluctuations. These challenges can be way-out by the bumping of infrastructure, enhancing competence on English language and online content, dissolving the crisis of teachers, comprising of incentives of teachers, resolution on research and development, encompassing of awareness of existing techno-pedagogical services, using of licensed software, eternal techno-pedagogy supportive resources, improving coordination among the departments, removing of frequent power outages and fluctuations, developing e-Content and web page for techno-pedagogical skills, developing Computer Based Learning Resources Management Systems, increase publicity about existing ICT services.

Keywords: Techno-pedagogy, Challenges, Role to Release, Higher Level of Education.

I. INTRODUCTION

Education system is now spectator a paradigm shift from the traditional chalk-and-talk teaching methodology to digitizing the pedagogical approach through technical devices. It opines that such a transformation is not only increasing the potentiality of the teachers but also widening the information base of students so as to make them competitive in the international arena. In today's world, most people need to keep on updating both their skills and knowledge to meet the challenges of everyday life. This has spurred new learning needs which exceed by far the formal courses, provided commonly by institutions, which allow targeting a general public. Instead, the needed trainings must be more informal in order to better address individual needs. The National Curriculum Framework (2005), stated that “ICT if used for connecting children and teacher with scientist working in universities and research institutions would also help in demystifying scientist and their work”. However, research findings have shown that there exist socio-economic, cultural, time and geographical barriers for people who wish to pursue higher education. Innovative use of Information and Communication Technology can potentially solve this problem (Bhattacharya and Sharma, 2007). Report of the working group on higher education for the XII five year plan (2011), entitled that “Information and Communication Technology is a mission mode project to provide connectivity, valuable content and low cost computing devices to all the Institutions of higher learning in the country. A National Knowledge Network will interconnect all universities, libraries, laboratories, hospitals and agricultural institutions for sharing data and computing resources across the country over a high-speed information network having gigabit capabilities. Every teacher should know how to use technology, pedagogy and subject area content effectively in their daily classroom teaching. It is clear that merely introducing technology to the educational process is not enough. One must ensure technological integration since technology by itself will not lead to change. Rather, it is the way in which teachers integrate technology that has the potential to bring change in the education process. For teachers to become fluent in the usage of educational technology means going beyond mere competence with the latest tools to developing an understanding of the complex web of relationships among users, technologies, practices, and tools. Teachers must understand their role in technologically-oriented classrooms.
Knowledge about the technology is important in itself, but not as a separate. Today the techno-pedagogical competency is very much needed for teachers in teaching and learning process, as it facilitates effective teaching and learning. The techno-pedagogical competency is nothing but the ability of the teachers to make use of technology effectively in teaching. The teachers develop techno-pedagogical competencies then they may try to make use of this often in teaching and it will in turn make the learning process simple and effective. In techno-pedagogy, there are three areas of knowledge, namely: content, pedagogy, and technology. Content is the subject matter that is to be taught. Technology encompasses modern technologies such as computer, Internet, digital video and commonplace technologies including overhead projectors, blackboards, and books. Pedagogy describes the collected practices, processes, strategies, procedures, and methods of teaching and learning. It also includes knowledge about the aims of instruction, assessment, and student learning. Beaudin and Hadden (2004) revealed in their study that techno-pedagogical skill foster the students for further development, attainment of learning outcomes and maintain the context of designing classroom based resources through the use of ICT by the teachers. Therefore, techno-pedagogy method was a necessary component of teacher education. Koehler and Mishra (2005) found in their study that good teaching was not simply adding technology rather the introduction of technology causes the representation of new concepts and requires developing sensitivity to the dynamic, transactional relationship among technology, pedagogy, content and knowledge. Techno-pedagogical skills knowledge carried out based on to increase the effectiveness and efficiency of learning and teaching process for professional development by technology integration. (Archambault & Crippen, 2009; Cox & Graham, 2009). Lee and Tsai (2010) found that meaningful use of ICT in the classroom requires the teachers to integrate technological affordances with pedagogical approaches for the specific subject matter to be taught. Yurdakul (2011) revealed in his study that preservice teachers need to provide opportunities to get practical knowledge and skills to use current technology during their training process. For that courses techno-pedagogical knowledge need to be added in teacher training programs. The technology centers in teaching and learning must be established in higher education institution. Sathiyaraj and Rajasekar (2013) found in their study that the techno-pedagogical competency needs to be improved in order to equip teachers to face the students belong to the digital era and also to face the challenges in the modern classroom. Monsiváis, McAnally and Lavigne (2014) revealed in their study that the integration of ICTs in the classroom depends on the teachers’ ability to scaffold the learning environment by using effective ICT-based pedagogies.

II. CONCEPTUAL FRAMEWORK

1. Techno-pedagogy

This is the hybrid method of teaching in which ICT is being used for teaching learning situation. Literally, 'pedagogy' refers to the art-science of teaching and 'techno' refers to the art-skill in handcrafting. Here, 'techno' is a qualifier, it intersects or crosses the meaning of 'pedagogy' with its own. Techno-pedagogy refers to weaving the techniques of the craft of teaching into the learning environment itself.

2. Higher level of education

India’s higher level of education system is the third largest in the world, next to the United States and China. The main governing body at the tertiary level is the University Grants Commission. Higher education is available through certain college-level institutions, including vocational schools, trade schools, and other career colleges that award academic degrees or professional certifications.

III. ROLE OF TECHNO-PEDAGOGY IN HIGHER EDUCATION

The main applications of the techno-pedagogy in higher education is teaching and learning (Vajargah, Jahani and Azadmansh, 2010). The prospects can be categorized as the aspects relating to role of techno-pedagogy, such as it helps to

- Enhance linguistic abilities
- Develop teaching learning process
- Improve to develop study materials
- Design multi-grade instruction
- Plan specific pedagogy
- Support in Distance Education through e-learning
- Guide and Counsel for career choices
- Stimulate Self Learning ability
- Enhance enrolment and examination process
- Assist in research activities
- Reinforce for cognitive learning
- Development of life skills
- Develop aesthetic sensibility
- Cultivate values of education in addition to this it also contributes for Special Education, Health Education, Yoga Education and Environmental Education.

IV. CHALLENGES OF USING TECHNO-PEDAGOGY IN HIGHER EDUCATION

Higher education is responding to globalization. It can be acknowledged that techno-pedagogy enhances better education rather than simple education but there are numerous challenges such as:

1. Destitute infrastructure of ICT for using Techno-pedagogical skills

Several collages do not have proper rooms or buildings so as to accommodate the technology. Pitiable ICT lab having hardly ever used web based instruction, electronic machine such as telephone, cellular phones, fax, radio, television, video, computer, poor cable network with internet, e-mail, hardware and software, poor satellite systems, injure videoconferencing etc. create the challenges to use techno-pedagogical skills in higher education.

2. Scarcity competence on English language and online content

English is the dominant language of internet. In our country English language proficiency is not high, especially outside of town areas. This represents a serious barrier in maximizing the educational benefits of the World Wide Web.

3. Calamity of Teachers with Techno-pedagogical skills

A Techno-pedagogical skill in Teacher Education is a challenging task because mediated communication demands more of perfection on the part of teacher educators with ICT skills. The four most common mistakes in introducing techno-pedagogical skill into teaching are i) installing learning technology without reviewing student needs and content availability; ii) imposing technological systems from the top down without involving faculty and students; iii) using inappropriate content from other regions of the world without customizing it appropriately; and iv) producing low quality content that has poor instructional design and is not adapted to the technology in use (UNESCO, 2009).

4. Lack of incentives of teachers

Though the hurdle of instructor awareness, there is also little incentive for teaching staff to devote time to altering their teaching methods from chalkboard to techno-pedagogical method through ICT or online learning.

5. Evils on Research and Development

Techno-pedagogical skill demands sound research base for intensive formative research. For that only two way communications is more effective than one way communication through two ways audio and two ways video communication.

6. Lack of awareness of existing techno-pedagogical skill services

Universities offer a rich assortment of ICT services for the development of Techno-pedagogical skill. But there seems to be little awareness among students and especially among teaching staff of the breadth of technology services available to them.

7. Hitch of using software

Use of unlicensed software i.e. pirated software in standard formats, as it is easy for costs of maintenance, also the legal problem to use ICT in different colleges. Even if the existence of licensed hardware and software, lack of capacity in equipment maintenance create serious problems to implement it.

8. Limited techno-pedagogical resources

Imperfect using multimedia resources for hybrid teaching methods leads to inferior learning outcomes for students, resulting the ICT illiterate of students at higher level of education.

9. Lack of coordination among the departments

There is lack of coordination across the campuses, colleges as well departments. University design separate website followed by colleges as well as departments and does not cross-reference to each others, resulting partial sharing of information for students by the University, colleges or departments.

10. Frequent power outages and fluctuations

The power outages and fluctuations dampen the potential impact for the use of techno-pedagogical skill. It became the reason for damage of working computer and other equipments which support the Techno-pedagogical frame.

V. ROLE TO RELEASE CHALLENGES OF USING TECHNO-PEDAGOGICAL SKILL IN HIGHER EDUCATION

Higher education is responding to globalization. Innovative use of techno-pedagogical skill can potentially solve the problems related to higher education. In spite of the complexity described above, there are also possibilities to way-out from facing challenges to use techno-pedagogical skill through ICT in higher level of education.

1. Bumping of infrastructure for using Techno-pedagogical skills

There is a need to develop adequate infrastructure both man and material as well as media culture. Collages need to require suitable rooms or buildings so as to accommodate the technology. There should have pitiable techno-pedagogy supportive lab with electronic machine such as telephone, cellular phones, fax, radio,
television, video, computer, cable network along with internet, e-mail, hardware and software, satellite systems, sound videoconferencing etc. In addition to that there must have provision of using WWW any moment, rely life time on telephone services, cable network and internet.

2. **Enhance competence on English language and online content**

Enhancement is required for the proficiency in English language as this is the dominant language of internet. Through this way maximum benefits of using World Wide Web can be achieved.

3. **Development of techno-pedagogic skills**

Mediated instruction demands techno-pedagogic skills. In teacher education programme teacher educators need to move from pedagogues to techno pedagogues. There should be adequate integration of micro teaching skills, media skills and techno-pedagogic skills. Therefore, there should be programmes to develop ICT literacy and Techno-Pedagogic competencies of teacher educators and teachers. There is an immediate need of identification of Techno-Pedagogic Skills and training the pupil teachers on these skills at various levels of teacher education.

4. **Dissolve the crisis of teachers with techno-pedagogical skills**

For the development of internal capacity of a teacher to use techno-pedagogical skills in teaching, learning, and research, teachers need to be involved in mount training, workshop and designing particular techno-pedagogical skills through ICT to ensure their relevance and effectiveness. Where expertise is lacking in conducting such assessments, training should be introduced to ensure that the implications of technology adoption and use are clearly understood and accounted for in short and long-term planning.

5. **Comprise of incentives of teachers**

There is a need for training all stakeholders who are involved in groundwork of techno-pedagogical skills. They should not be scared that techno-pedagogical supportive material would replace teachers. Teachers’ educator should provide incentives for the teachers by devoting time to altering their teaching methods from chalkboard to hybrid method i.e. techno-pedagogical method. It is also essential more generally to provide prior training for faculty when introducing techno-pedagogical skills.

6. **Resolution on Research and Development**

A sound research base is required for applying in research and development purposes. For that two way communications need to be developed through two ways audio and two ways video communication. On the other hand college or university should make available of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time.

7. **Encompass of awareness of existing techno-pedagogical services**

Though Universities offer a rich assortment for using techno-pedagogical skills. Therefore, there seems to be healthy awareness among teaching staff of the breadth of technology services available to them. There should be focus on networking of all educational institutions as well as developing low cost and low power consuming access devices.

8. **Solution on problem of using software**

Clear policies and procedures for procuring computer hardware and software are necessary to prevent such problems. There should be punishable provision for using of unlicensed software or any pirated software in standard formats. Consequently college and university must arrange proper equipment maintenance capacity to implement it in higher education.

9. **Eternal techno-pedagogy supportive resources**

Sharing of infrastructural resources and innovations, learning materials can reduce development costs. Some effort should have been made on the development of instructional material in the form of Audio Cassettes, Video Films, Computer Assisted Learning Material, Educational Radio Programmes, Educational TV programmes, and Web Bases Instructional Material. Apart from having enabling telecommunications and ICT policies, governments and higher education institutions will need to develop strategies for effective media deployment and sustainability. Sound techno-pedagogical skills leads to superior learning outcomes for students.

10. **Improve coordination among the departments**

There should be pleasant cooperation and coordination across the campuses, colleges as well departments. Consequently if university design separate website followed by colleges as well as departments then there must be cross-reference to each others to share their information for students. Collaborative efforts of agencies such as MHRD, Department of Information Technology and Department of Tele communications would be utilized to ensure fully electronic universities and digital campuses.

11. **Remove of Frequent power outages and fluctuations**

Uninterruptible power supplies (UPS) can be used to save the data during an outage. Subsequently, university or higher educational organization must have electricity improvement projects to overcome the frequent power outages and its fluctuations such as projects related to the use of solar, hydro, wind, wave or biogas energy.

12. **Developing techno-pedagogical E-Content**

The best practices in creation of techno-pedagogical E-content, its dissemination, criteria for selection and evaluation requires large scale networking among E-content users and producers.
13. Teacher Education with techno-pedagogical skills
Courses, namely, Educational Technology (ET) and ICT in Education should be offered as core courses at the different levels of teacher education. There could be Teacher Education certificate and degree programmes specially devoted to these areas with extended duration. Also, refresher courses, workshop should be conducted on ET and ICT. Digital lesson Planning and Implementation should be promoted in all the teacher education institutions.

14. Computer Based Learning Resources Management Systems
Learning Resources in various media forms such as, CDs, Video films should be available in all the libraries of educational institutions. Libraries need to be progressively converted into digital libraries in which teachers will be able to assemble the materials for construction of techno-pedagogical frame.

15. Formation of web page
Web pages should be developed for teaching various subjects through the affair of techno-pedagogical skills. Techno-pedagogical skills based CDs may be developed as web resource on various subjects.

16. Increase publicity about existing ICT services
A publicity campaign would go a long way to improve the impact of the comprehensive techno-pedagogical skills training through ICT. The campaign could be integrated with existing events (e.g. student orientation, departmental meetings) or existing platforms. For example, KNUST already has a dynamic community on Face book.

VI. CONCLUSION
Techno-pedagogy is a key deciding factor for the hybrid approach of meta-teaching. The last two decades have witnessed the inclusion of developments in techno-pedagogical skills in higher education systems around the world. Use of techno-pedagogical skills can break down some of the barriers that lead to underachievement, student disaffection and educational exclusion (Das, 2007). However, when one looks around, in most of the colleges and universities across the country lack of harnessing of this potential is visible. In spite of the fact that planning and implementation of initiatives for enhancing role of techno-pedagogical skills in higher education have received priority, analysis of the existing scenario reveals number of factors which have been impeding the integration of technology in higher educational sector. Apart from the policies related to the technology, governments and higher education institutions will need to develop strategies for effective techno-pedagogical skills and media deployment and sustainability. Finally, technology is never a substitute for good teaching. Without techno-pedagogical skilled instructors, no electronic delivery can achieve good results.

REFERENCES