An Investigation of the role of Techno-pedagogical skills implementation, their difficulties, and their release at the Higher Education level

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Abstract

Techno-pedagogical skills are the means by which all people can receive high-quality education at a reasonable price. Both the NCF (2005) and the XII five-year plan (2011) placed a strong emphasis on giving all of the nation's higher education institutions access to affordable computers, useful material, and connection. This hybrid talent makes it easier to improve language skills, create multi-grade training, and sketch out a specific pedagogy using advanced study resources. Techno-pedagogical skills in higher education face a number of obstacles, including insufficient ICT infrastructure, a lack of proficiency in English and online content, disasters, a lack of teacher incentives and awareness, problems with research and development, software bugs, a lack of departmental coordination, and frequent power outages and fluctuations. These issues can be resolved by improving infrastructure, improving proficiency in the English language and online content, resolving teacher crises, including teacher incentives, resolving research and development issues, raising awareness of existing technological pedagogical services, utilizing licensed software, creating e-content and a website for technological pedagogical skills, reducing frequent power outages and fluctuations, improving departmental coordination, creating Computer Based Learning Resources Management Systems, and increasing awareness of existing ICT services.

Key word – Techno-pedagogical skills, Higher level education

I. Introduction

The educational system is currently witnessing a paradigm change away from the conventional chalk-and-talk teaching style and toward the digitization of the pedagogical approach using technological gadgets. It suggests that this kind of change is not just boosting instructors' ability but also expanding students' knowledge bases to help them compete on a global scale. The majority of individuals in today's society must constantly update their knowledge and abilities to handle the demands of daily living. This has led to the emergence of new learning requirements that considerably beyond the formal courses that are frequently offered by colleges and enable wide public targeting. In order to better meet the demands of each individual, the necessary trainings must be more casual. According to the National Curriculum Framework (2005), "ICT would also help to demystify scientists and their work if it were used to connect children and teachers with scientists working in universities and research institutions." However, studies have revealed that those who want to pursue higher education face constraints related to time, place, culture, and socioeconomic status. Information and communication technology used creatively may be able to address this issue (Bhattacharya and Sharma, 2007). According to the 2011 report of the higher education working group for the XII five-year plan, "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."

All of the nation's colleges, libraries, labs, hospitals, and agricultural establishments will be connected by a National Knowledge Network, which will provide a high-speed, gigabit information network for the exchange of data and computer resources. In their everyday classroom instruction, all teachers should be proficient in the use of technology, pedagogy, and subject-area material. The integration of technology into the educational process alone is obviously insufficient. Since technology won't bring about change on its own, it is imperative to achieve technological integration. Instead, the technique by which educators use technology has the power to alter the educational process. Teachers must get an awareness of the intricate web of interactions between users, technologies, practices, and tools in order to become proficient in using educational technology. This goes beyond simply being proficient with the newest tools. Instructors need to be aware of their responsibilities in technologically advanced classrooms.

While technological knowledge is useful in and of itself, it is not sufficient. Effective teaching and learning are made possible by techno-pedagogical competency, which is now a critical skill for educators. Teachers' capacity to use technology effectively in the classroom is known as techno-pedagogical competence. Teachers who have developed their techno-pedagogical skills may attempt to apply this regularly in their instruction, which will simplify and improve the learning process. Content, pedagogy, and technology are the three domains of knowledge that comprise techno-pedagogy. The subject matter that will be taught is known as content.

Technology includes both everyday devices like overhead projectors, whiteboards, and books as well as contemporary devices like computers, the Internet, and digital video. The collective practices, procedures, tactics, processes, and methods of teaching and learning are referred to as pedagogy. Knowledge of the objectives of education, evaluation, and student learning is also included. In their study, Beaudin and Hadden (2004) found that techno-pedagogical skills help students go further, achieve learning objectives, and preserve the context of creating classroom-based materials using ICT by instructors. As a result, the techno-pedagogy approach was essential to teacher preparation.

According to Koehler and Mishra's (2005) research, effective teaching involves more than just incorporating technology; rather, it involves introducing new ideas and necessitates cultivating an awareness of the dynamic, transactional relationship between technology, pedagogy, content, and knowledge. Technology integration is the basis for the application of techno-pedagogical skills and knowledge to improve the efficacy and efficiency of the teaching and learning process for professional growth. Cox and Graham (2009) and Archambault and Crippen (2009).

Lee and Tsai (2010) discovered that in order to effectively employ ICT in the classroom, teachers must combine pedagogical techniques for the particular subject matter being taught with technical affordances. During their training, preservice teachers should be given the chance to get practical knowledge and abilities to use modern technologies, according to Yurdakul's (2011) research.

Techno-pedagogical knowledge must be included into teacher training programs for those courses. Institutions of higher education must set up technology centers for instruction and learning. In order to prepare instructors to deal with pupils who are part of the digital age and the problems of the modern classroom, Sathiyaraj and Rajasekar (2013) discovered that they need to increase their techno-pedagogical competency. In their research, Monsiváis, McAnally, and Lavigne (2014) found that the use of ICTs in the classroom is contingent upon the teachers' capacity to use successful ICT-based pedagogies to scaffold the learning environment.

II. FRAMEWORK FOR CONCEPTS

1. Techno-pedagogy

ICT is utilized in this hybrid teaching approach to create a learning environment. The terms "pedagogy" and "techno" literally represent the art-science of education and handcrafting, respectively. "Techno" is a qualifier in this context, crossing over into its own definition of "pedagogy." The term "techno-pedagogy" describes the integration of educational methods into the actual classroom.

2. Higher education

After China and the United States, India has the third-largest higher education system in the world. The University Grants Commission is the primary governing body at the postsecondary level. Certain college-level organizations, such as trade schools, vocational schools, and other career colleges that grant professional certifications or academic degrees, offer higher education.

III. TECHNO-PEDAGOGY'S PART IN HIGHER EDUCATION

In higher education, teaching and learning are the primary uses of techno-pedagogy (Vajargah, Jahani, and Azadmanesh, 2010). The opportunities may be divided into elements that pertain to the function of techno-pedagogy, including how it aids in

- Boost your language skills
- Develop the process of teaching and learning.
- enhance the creation of study resources
- Create teaching materials for many grade levels.
- Prepare a certain pedagogy.
- e-learning assistance for distance learning, career guidance, and career counselling
- Encourage your capacity for self-learning
- Make the Enrollment and testing process better
- Participate in research-related activities
- Enhance cognitive learning
- Building life skills
- Learn to appreciate beauty

In addition to fostering educational principles, it also supports special education, health education, yoga education, and environmental education.

IV. TECHNO-PEDAGOGY'S DIFFICULTIES IN HIGHER EDUCATION

Globalization is influencing higher education. While it is true that techno-pedagogy improves education rather than merely providing it, there are a number of obstacles to overcome, including:

1. **Insufficient ICT infrastructure to employ techno-pedagogical skills**

There are several collages that lack the structures or spaces necessary to accommodate the technology. The use of techno-pedagogical skills in higher education is made more difficult by a pitiful ICT lab that rarely uses web-based instruction, electronic devices like computers, phones, cellular phones, fax machines, radios, televisions, and video, as well as by the poor hardware and software, satellite systems, e-mail, and cable networks.

2. **Limited proficiency in English and internet material**

Internet usage is dominated by English. Particularly outside of urban regions, English language proficiency is low in our nation. In terms of optimizing the educational advantages of the World Wide Web, this poses a significant obstacle.

3. **Teachers with Techno-Pedagogical Skills Are at Risk for Disaster**

It is difficult to be a techno-pedagogical teacher since mediated communication requires teacher educators with ICT abilities to be more flawless. According to UNESCO (2009), the four most frequent errors made when integrating techno-pedagogical skills into instruction are: i) installing learning technology without considering the needs of the students and the availability of content; ii) enforcing technological systems from the top down without consulting faculty or students; iii) using inappropriate content from other parts of the world without customizing it appropriately; and iv) creating low-quality content with poor instructional design and not tailored to the technology in use.

4. **Absence of teacher incentives**

Despite the obstacle of instructor knowledge, teaching staff members have limited motivation to invest time in switching from blackboard to techno-pedagogical approaches using ICT or online learning.

5. **Negative effects on research and development**

A solid research foundation is necessary for extensive formative research in techno-pedagogical skills. Only two-way communication-two-way audio and two-way video—is more efficient than one-way communication for this reason.

6. **Techno-pedagogical resources are few**

Students that use multimedia resources poorly for hybrid teaching techniques get worse learning outcomes, which makes them ICT illiterate at higher education levels.

7. **Ignorance of the available services for techno-pedagogical skills**

Universities provide a wide range of ICT services to help students enhance their techno-pedagogical skills. However, it appears that students and teaching staff in particular are not well informed of the variety of technological resources at their disposal.

V. PURPOSE TO EXPLAIN THE DIFFICULTIES OF APPLYING TECHNO-PEDAGOGICAL SKILLS IN HIGHER EDUCATION

In response to globalization, higher education is changing. Problems in higher education may be resolved by creatively applying techno-pedagogical skills. Despite the complexity mentioned above, there are ways to overcome the difficulties in using ICT to employ techno-pedagogical skills in higher education.

1. **Infrastructure bumping to make use of Skills related to technology-based education**

In addition to media culture, proper infrastructure—both human and material—must be developed. For colleges to incorporate the technology, appropriate spaces or facilities are needed. A deplorable techno-pedagogy support lab comprising electronic devices such phones, mobile phones, fax machines, radios, televisions, video cameras, computers, cable networks with internet access, email, hardware and software, satellite systems, sound videoconferencing, etc. should be available. Additionally, there should be the option to access the WWW at any time, as well as lifetime access to cable networks, the internet, and phone services.

2. **Improve proficiency with internet material and the English language**

English is the most widely used language on the internet, thus improving one's ability in it is necessary. You can get the most out of utilizing the World Wide Web in this way.

3. **Acquisition of Techno-Pedagogical skills**

Techno-pedagogical skills are necessary for mediated education. Teacher educators must transition from pedagogical to technological pedagogy in their teacher education programs. The integration of media skills, techno-pedagogic skills, and microteaching abilities should be sufficient. As a result, teacher educators and teachers should participate in programs that enhance their ICT literacy and Techno-Pedagogic skills. At all teacher education levels, there is an urgent need to identify techno-pedagogic abilities and train student instructors in them.

4. **Resolve the teacher shortage of techno-pedagogical skills**

In order for teachers to build their internal ability to employ techno-pedagogical skills in teaching, learning, and research, they must participate in workshops, mount training, and the design of specific techno-pedagogical skills using ICT to assure their efficacy and relevance. Training should be implemented in areas where there is a lack of experience performing these kinds of evaluations to guarantee that the effects of adopting and using technology are fully recognized and taken into consideration in both short- and long-term planning.

5. **Awareness of current technological-pedagogical services**

Despite this, universities provide a wide range of opportunities to use techno-pedagogical skills. As a result, instructional staff members appear to be well-informed about the variety of technology options at their disposal. The development of low-cost, low-power access devices and the networking of all educational institutions should be prioritized.

6. **Techno-pedagogical competences in teacher education**

At the various stages of teacher education, courses like Educational Technology (ET) and ICT in Education have to be provided as required courses. Certificate and degree programs in teacher education that are specifically focused on these topics and last a long time may exist. Additionally, workshops and refresher training on ET and ICT should be held. Every teacher education institution should encourage the planning and execution of digital lessons.

7. Creating E-content that is techno-pedagogical

The best methods for producing techno-pedagogical e-content, distributing it, and establishing selection and assessment criteria necessitate extensive networking between e-content creators and users.

VI. CONCLUSION

One of the main determinants of the hybrid approach to meta-teaching is techno-pedagogy. around the past 20 years, higher education institutions all around the world have incorporated advancements in techno-pedagogical skills. Some of the obstacles that cause underachievement, student disenchantment, and educational exclusion can be removed by using techno-pedagogical skills (Das, 2007).However, it is evident that this potential is not being fully utilized in the majority of schools and institutions around the nation. Analysis of the current situation shows a number of factors that have been preventing the integration of technology in the higher education sector, despite the fact that planning and implementing initiatives to enhance the role of techno-pedagogical skills in higher education have received priority. In addition to technology-related regulations, governments and institutions of higher learning will need to create plans for media deployment, sustainability, and effective techno-pedagogical abilities. Lastly, effective instruction can never be replaced by technology. No electronic delivery can be successful without teachers who are proficient in techno-pedagogy.

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