

TECHNO PEDAGOGICAL COMPETANCY AND TECHNOLOGY INTEGRATION

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Introduction

Education is described as the systematic acquisition of ability and knowledge via formal and informal exposure to information, ideas, and experiences. It helps to shape an individual's personality. Education is now witnessing a paradigm change from the era of traditional chalk-and-talk teaching methodology to digitizing the pedagogical approach using technical equipment and stylus as a result of technological advancement. For a more effective teaching and learning process, the traditional classroom concept has been replaced by a digital classroom. Every new innovation is entering the world of education, mostly to assist teachers in properly managing their classrooms. We live in a digital world, and education is inextricably linked to information and communication technology. Technology enables learners to engage in self-learning and individualized learning both inside and outside the classroom. Teachers are leveraging digital tools to provide pupils with more tailored experiences. The ever-expanding growth of technology has redefined teaching and learning in a new way. It has offered a new perspective to the classroom and radically altered the teaching. As a result, teachers must become acquainted with the incorporation of technology into the classroom.

Every day, new scientific and technical advancements emerge. These improvements will be implemented in the fields of educational theory and practice. Technology pervades many aspects of life and practically every sector of human endeavour; technological abilities are becoming increasingly important in all subject areas, as the computer has become the universal vehicle for the acquisition and transmission of knowledge in all fields. It is directly tied to innovation and the conversion of information into new and valuable products.

The process of innovation necessitates not only creative individuals and organizations, but also the availability of technology, science, and engineering talent.

Without a question, the most significant challenges to integrating ICT in the classroom will be the pedagogical implications, the impact on curriculum structure and content, classroom organization and practice, and the teacher's transformed position. Over the previous two decades, technological-pedagogical skills have been integrated into higher education systems all over the world. The use of technological pedagogical abilities has the potential to break down some of the barriers that contribute to underachievement, student dissatisfaction, and educational marginalization. Students and teachers of the twenty-first century demand information to be accessible, rapid, and multidimensional. Teachers' integration of technology is hampered by a lack of successful growth possibilities in the technology and pedagogy constructions.

Educational technology is very strongly related with innovation, which is the turning of ideas into new and valuable goods or processes. Education and technology are fundamentally linked. Educational technology is the application of laws, as well as modern scientific and technological discoveries, to the educational process. In other terms, educational technology refers to the use of scientific methods and procedures in education. Educational technology is frequently thought to be a combination of two aspects: technology of education and technology in education. Technology of education is a technological approach to education, whereas technology in education represents the application of technology to any process of an educational organization.

Technological competency: In general, competency refers to the capacity to complete a task successfully or efficiently. Competency is defined as "adequate for the purpose, suitable, sufficient, or legally qualified, admissible, or capable". Competency synonyms include capability, ability, proficiency, expertise, and skill, among others. Teachers, like other professionals, must become adaptable in

their use of technology as the field of educational software evolves alongside the various academic disciplines. Technology may help instructors with a variety of professional activities, most notably stimulating learning outside of the classroom, as well as developing our knowledge of working with technology, tools, and resources. Working with technology can apply to all technological tools and resources.

Pedagogy is the discipline concerned with the theory and practice of teaching. The term "pedagogy" is derived from the Greek terms "paid and agogos". The term "paid" refers to a youngster, while "agogos" means to guide. So the name "pedagogy" literally means "to lead the child". Thus, pedagogy has been described as the art and science of instructing children. Pedagogy is defined as the art or profession of teaching, as well as prior training or instruction. It is a master plan that contains a detailed examination of what a teacher should do. Teaching tactics, teacher actions, and teacher judgments and decisions are all informed by pedagogy, which takes into account learning theories, an understanding of students and their needs, and individual students' histories and interests.

Pedagogical competency: Pedagogy is the art of teaching. Some tactics work better for teaching specific skills and information than others. Some tactics are more appropriate given students' backgrounds, learning strategies, and skills (Notify-RSS, 2002). The implementation of optimal pedagogy in the classroom promotes the well-being of both individuals and communities. Pedagogical competency encompasses much more than just verbal communication. It incorporates knowledge of several "alternative instructional methods." Pedagogical competence also refers to teachers' teaching and educational qualifications, and when measuring pedagogical competency, each individual should prioritize teaching quality. Pedagogical competence is founded on solid, extensive, and current knowledge of the subject area, as well as knowledge of student learning and subject-specific teaching and learning challenges.

Techno-pedagogical competence This is a hybrid teaching style in which ICT is employed to teach a learning environment. It is the ability of instructors to effectively integrate technology and pedagogy in the classroom, and teachers with expertise in techno pedagogy integration can bring the entire world into the classroom. Techno-pedagogical competency refers to a teacher's capacity to effectively employ technology in education. A teacher with proficiency in technology and pedagogy must be aware of the existence, components, and capabilities of the many technologies utilized in teaching and learning environments.

Role of Techno-Pedagogy in Education

Applications of the techno-pedagogy in the educational process can be categorized such as it helps to

- Improve linguistic competencies.
- Develop the teaching-learning process.
- Improve study materials for teaching and learning.
- Introduced multi-grade instructional programmes.
- Organize a specific pedagogy and curriculum.
- Support in Distance Education through e-learning, mobile learning, and online learning.
- Provide guidance and counselling services for career development.
- Boost Self Learning hobbies among students.
- It improves the enrolment and examination processes.
- Assist in conducting research programs.
- Reinforce for cognitive learning.
- Develop aesthetic sensibility through technology.
- Cultivate educational values among teachers and students.

- It makes a significant contribution to Special, Health, Yoga and Environmental Education.

Techno-Pedagogy Challenges in Education

Globalization is solely due to education. It is undeniable that techno-pedagogy improves education over traditional education, however, there are various techno-pedagogical challenges in the education system before the teachers, which are as:

- **Lack of proper infrastructure for implementing**

Technopedagogical skills Several institutions lack the appropriate facilities or infrastructure to implement technology. The barriers to using techno-pedagogical skills in the education system are created by poor labs that rarely use web-based instruction, electronic equipment such as telephones, cell phones, fax machines, radio and television, audio and video players, computers, cable networks, e-mail, hardware and software, poor communications satellites, damaged videoconferencing, and so on.

- **A calamity of Teachers with Techno-pedagogical skills**

Even while interpersonal communication necessitates a higher level of digital literacy on the part of teachers, education continues to face a substantial technological-pedagogical challenge. The common failures in incorporating techno-pedagogical competency into classroom instruction are: adopting learning technology without considering the requirements of students and the availability of content; enforcing advanced technologies from the top to bottom without engaging teachers and students; using unsuitable material from other parts of the world without appropriately altering it; and generating poor quality content with poor instructional strategies.

- **Lake of motivation for teachers**

Aside from the barrier of teacher competence, there is no incentive for teaching staff to commit to shifting their pedagogical techniques from blackboard to techno-pedagogical approaches via technology or web-based learning.

- **Research and Development Malpractices**

For substantial formative research, techno-pedagogical abilities require a strong research basis. As a result, only two-way communication (including voice and visual) is more effective than one-way communication.

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- **Technological-Pedagogical Skill Services Unawareness**

Institutions provide a wide range of ICT infrastructure to support the development of techno-pedagogical capacities. However, it appears that students, particularly educational professionals, are unaware of the various digital tools available to them.

- **Major Software-related hurdles**

Unlicensed software, sometimes known as pirated software in standard formats, is frequently utilized since it reduces maintenance costs and solves the legal issue of using technology in numerous institutions. Even when licensed gear and software are available, deployment is difficult due to a lack of capacity for equipment maintenance.

- **Technology-pedagogical resources are limited**

Improper use of multimedia resources in blended educational approaches leads to low student accomplishment, which contributes to digital illiteracy among students at all levels of education.

TECHNOLOGY INTEGRATION

In education, technological integration refers to the use of technology to enhance learning and fulfil pedagogical goals. Teachers can use computers, smartphones, virtual reality tools, and other cutting-edge technology to help pupils study. Effective technological integration complements the existing curriculum and is part of the educational experience, alongside traditional teaching techniques and group projects. Classrooms that efficiently integrate technology often have a low student-to-device ratio, ensuring that each student has adequate opportunities to use the equipment.

LEVELS OF TECHNOLOGY INTEGRATION

Education professionals frequently use the term SAMR (substitution, augmentation, modification, and redefinition) to describe the four degrees of technological integration. Here's what the various tiers include:

SUBSTITUTION

At the substitution level of technological integration, teachers may replace a traditional tool with a digital equivalent while maintaining the lesson or activity goals. One example of a technology substitution is a teacher who permits pupils to compose their essays using word processing applications. Digital copies of textbooks without interactive features or connected information are also considered technological equivalents because they include the same content as the printed version. Substitution is the most cost-effective level of technological integration and may be suitable for big courses with varying levels of access to technology.

Augmentation

The augmentation level of technological integration involves using technology to add additional features or resources, such as spell-checking and grammatical correction facilities in a word processing program. A class plan's goals and

activities may not change, but students now have access to additional content via technological delivery. For example, while the digital version of a mathematics textbook may contain the same text and activities as the paper version, students using the digital version may be able to click a link next to a sample problem to view a video of someone answering the problem.

Modification

The next step of technology integration is modification, in which an instructor alters portions of an activity to match the capabilities of a technological medium. A teacher, for example, could modify a peer-review exercise to incorporate document-sharing software. Students can use this tool to ask questions about their peers' work or highlight areas of text to make editing easier. Teachers may also use technology modifications to convert in-person events to a remote or hybrid format. Video-conferencing software frequently includes chat and poll functions, which allow students to ask their teacher questions anonymously.

Redefinition

The highest level of technological integration is redefinition, in which a teacher uses technology to create activities and lesson plans. This level is suited for schools when all students have equal access to digital resources and teachers have extensive expertise utilizing technology to teach. For example, a fourth-grade class in California could develop an educational collaboration with a similar class in Mongolia. The two courses can use video chat and translation tools to learn about each other's cultures and geography. In this scenario, technical tools enable the activity.

Benefits of Technology Integration in the Classroom

Here are some major advantages of employing technology in the classroom:

Flexibility

Many teachers use online course administration software, which make it easier to adjust deadlines and add content to lecture modules than traditional approaches. For example, if a literature teacher using a traditional textbook wants their

students to read a poem that is not included in their anthology, they may photocopy the poem and distribute it to students, which could take many class sessions if any students are missing. A teacher utilizing a course management platform can simply include a link to the poem in their lecture module and alert all of their students right away.

Expanded Emphasis

The participatory aspect of technological integration can increase students' attention spans and keep them engaged on a particular topic or activity. Teachers can use technology to engage children by combining several sorts of activities and education. A biology instructor, for example, may design a lesson plan on cell structure for a high school class. An online pre-test to measure student knowledge of the subject might be included in the lesson plan, followed by an animated film that explains the major sections of a cell. Following that, students could collaborate in groups to make 3D models of cells using an interactive digital tool.

Easy access

Technological integration in the classroom allows students to access their grades, assignment calendar, and textbooks from any device, making it easier for them to complete their assignments. A student may forget their planner, notepad, or textbook, but they cannot lose or forget material stored in a course management account or digital text. Students can also use these technologies to complete schoolwork while on vacation or at a sporting event. Some school districts use electronic transmission for permission slips and other parent responsibilities, which can help raise completion rates.

Additional Resources

When students use computers and smartphones to accomplish homework, they may have access to more materials than traditional textbooks provide. Students may conduct internet searches to learn about people and events not covered in their curriculum, thus increasing their comprehension of a concept or historical

period. Many textbook publishers provide online resources with their books, which students and teachers can access if they use a specific edition of the textbook. These resources may contain additional tasks, movies, and interactive games that put students' knowledge to the test.

Administrative support

Technological integration encompasses both educational and administrative technologies that allow teachers to conveniently preserve records and share them with stakeholders. Some course management platforms integrate grade and attendance records, allowing teachers to track students' performance on a daily basis. Educators can easily calculate quarterly and final grades using these tools. Depending on the school's data sharing policy, parents may have continual access to student grades, which can alleviate their concerns about progress reports. Grade management solutions can also help teachers create reports for principals and district administrators.

Conclusion

Techno-pedagogy is a critical determining component in the composite meta-teaching approach. Over the last few years, advances in techno-pedagogical capacities have been implemented into education systems around the world. Several of the barriers that contribute to academic failure, learner discontent, and educational marginalization can be overcome by utilizing techno-pedagogical abilities. When looked at from the outside, it is clear that practically all institutions and organizations in the country are failing. Even though measures to improve the function of techno-pedagogical competencies in the education system have been prioritized in planning and implementation, an examination of the current situation reveals a number of factors that have hampered technology integration in the educational sector. In addition to technological policy, governments and higher education

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