

ROLE OF TECHNO-PEDAGOGICAL SKILLS FOR ENHANCING TEACHING AND LEARNING

¹SONAM BANSAL

¹ASSISTANT PROFESSOR, RAO LAL SINGH COLLEGE OF EDUCATION, SIDHRAWALI, GURUGRAM
(HARYANA) INDIA

Abstract

Techno-pedagogical skills are approaches to make great education accessible and reasonable for all. To provide connectivity, relevant material, and low-cost computer devices to all teaching and learning groups in the country was underlined in the National Curriculum Framework (2005). Constructing multi-graded education requires this hybrid expertise. The level of educational attainment in the twenty-first century will be higher than it was in the twentieth because of these developments and expansions. To prepare students for the challenges of the 21st century and to help them succeed in their future endeavors, teachers must incorporate technology into their classrooms. The future educational environment will necessitate the acquisition of general and specialized knowledge and skills by teachers if they are to remain relevant and successful. One need to implement innovative techno-pedagogical skills by improving infrastructure, improving English language proficiency and online content knowledge, resolving teacher shortages, increasing teacher incentives, increasing awareness of existing techno pedagogical services, using licensed software, enhancing departmental coordination, and reducing frequent power outages and fluctuations in electricity. Assisting in eliminating the barriers that occur in the process of instruction at all levels of school, technology has a tangible impact on education. Thus, it has made teaching easier, and learning more fun. Assisting teachers in their professional development and meeting the diverse requirements of all types of learners, technology can help foster universal access to education. In this aspect, technology's impact on teaching and learning is immense. To teach today's students, teachers must recognize the value of integrating technology with pedagogy. However, integrating technology and pedagogy successfully provides numerous benefits for classroom teachers. In order to transform pupils into productive citizens, teachers must overcome these obstacles and strengthen their techno pedagogical talents.

Keywords: Techno-Pedagogy, Pedagogy, Techno-pedagogical Skills, Teaching & Learning.

INTRODUCTION

"The technology itself does not have transformational potential. It is the school, and specifically the pedagogy, that is transforming."
(Tanya Byron)

The introduction of new technology has had an impact on every element of human existence. In today's world, it is unthinkable to have a lesson without technology. As a result of these advancements and growth, learning standards in the twenty-first century will be greater than they

were in the twentieth century. Technology-based learning in the classroom is essential for preparing students to navigate the 21st century and preparing them to be successful in their future endeavours. Teachers would need to learn new information and abilities, both general and specialized, in order to be able to survive and succeed in the future educational environment.

It's important to know about the technology, but not as a stand-alone. Teachers in today's classrooms need to be well-versed in technology-enhanced pedagogy in order to do

their jobs effectively. The ability of teachers to use technology effectively in the classroom is known as techno-pedagogical competency. Teachers who have gained proficiency in technological pedagogy can put that knowledge to good use in the classroom, resulting in an easier and more efficient learning experience for students. The three pillars of techno pedagogy are content, pedagogy, and technology. The subject matter to be taught is referred to as "content." In addition to computers, the Internet, digital video, and overhead projectors, everyday technologies like books and blackboards also fall under the umbrella of technology. The term "pedagogy" refers to the study and application of educational theory, methods, and procedures. It also contains an understanding of the objectives of education, assessment, and student learning. – Technology-enhanced pedagogy, according to Beaudin and Hadden (2004), helps teachers create engaging classroom resources while also helping students reach their full potential as learners. Because of this, the use of the techno-pedagogy approach was a vital part of teacher training. When it comes to successful teaching, it's not just about adding technology; it's about establishing a sense of the dynamic, transactional link between technology, pedagogy, content, and knowledge, according to Koehler and Mishra (2005). Knowledge of how to use technology to improve the efficiency and effectiveness of the teaching and learning process for professional growth. It has been reported that Archambault and Crippen (2009) as well as Cox and Graham (2009).

A study by Lee and Tsai (2010) indicated that teachers who utilise ICT effectively in the classroom need to integrate the technology with pedagogical approaches that are appropriate for the subject matter they are teaching. Preservice teachers, according to Yurdakul (2011), need opportunities to have hands-on experience with current technology as part of their education. Courses in technological pedagogy must be added to teacher preparation programmes in order to accommodate them. Colleges and universities need to set up technology-based teaching and learning centres. Techno-pedagogical competence must be increased in order for teachers to face pupils from the digital era and the issues of the modern classroom, according to Sathiyaraj and Rajasekar (2013). Using effective ICT-based pedagogies, Monsiváis, McAnally, and Lavigne (2014)

found that the ability of instructors to scaffold the learning environment is critical to successful ICT integration in the classroom.

WHEN IT COMES TO EDUCATIONAL TECHNOLOGY, THERE IS FREQUENTLY A MISALIGNMENT BETWEEN THE VALUE OF TECHNOLOGY AND INDEED THE IMPORTANCE OF PEDAGOGY.

Some people believe that technology is not essential and they should be more concerned with education. On the other hand, others choose to focus on the opportunities presented by technology while they wait for theory to catch up with reality.

It's probably more advantageous to think of the two of them as constantly conversing. Technology creates new possibilities and is applied in ways its designers never envisioned, resulting in theoretical advancement, contribution to technological improvement, and other beneficial effects.

The best minds frequently tell teachers in education that pedagogy is the driver and technology accelerates their classrooms. When it comes to teaching, pedagogy (also known as the art of teaching) is a prism through which educators can ensure that material, techniques, and students are prioritized. Of course, technology is introduced later in the process.

Do you think there is a time in school when technology might be the driving force behind learning?

What would happen if pedagogy were to take a back seat, even for a short period?

These are essential questions to ponder.

Teachers put quite a lot of effort into planning lessons and creating circumstances for success. However, we all know that not all learning takes place in the classroom. Some of the essential life lessons are learned through our personal experiences and reflections. Some of these experiences are now made possible through technological means. So perhaps it is time for schools to pay a bit more attention to these technological tools.

One advantage of using technology to guide instruction is the increased accessibility it gives to pupils. In addition, it provides the power to

build new things that would not otherwise be possible.

As we all know, innovation is at the heart of every society's development. Innovations aid in the growth and improvement of the overall quality of any process, product, service, or idea implemented. In every human community, it has been discovered that inventions exist in various forms and degrees, with variable levels of prevalence

Innovative methods to education and the teaching-learning process, make the process more relevant, entertaining, and valuable via the use of various types of technologies and methodologies. The stakeholders in the education system must keep up to date on their knowledge, skills, and capacities to implement innovative pedagogical ideas and approaches.

PEDAGOGY

Pedagogy refers to the theory and practise of learning and how this process influences and is influenced by the social, political, and psychological growth of learners. According to Merriam-Webster, pedagogy is the "art, science, or profession of teaching; especially: education.

Even while pedagogy covers a wide range of topics, at its core, pedagogy is concerned with how students are taught. There are many moving parts to pedagogy, including instructional approaches, feedback and assessment.

PEDAGOGICAL SKILLS

A grasp of how students learn in a certain subject area is essential to pedagogical abilities, which include the ability to organize, lead, and promote education and teaching overseas. Pedagogical skills can include the ability to connect classroom instruction to relevant research.

Knowledge of representations of subject matter (content knowledge), knowledge of students' conceptions of subject matter (learning and teaching outcomes), and general knowledge of pedagogy are all essential components of pedagogical skills (or teaching strategies). Other factors included: (4) curriculum knowledge; (5) educational context awareness; and (6) educational objectives.

INNOVATIVE PEDAGOGY

New pedagogical approaches are being developed as a result of the shift away from rote memorization and toward the development of more skill-based knowledge. Educators use a combination of subject-matter expertise, teaching and learning methods, and technological know-how to design learning environments that foster creativity and innovation among students, whether they are in the classroom or online.

Students' attention can be captured by teachers via pedagogy. By allowing students to recollect all of the visions offered to them, educational techniques to teaching theoretical concepts help students improve their recall ability.

Innovative learning occurs when students are able to recall all of the concepts they've been taught for a long period of time.

NEED OF INNOVATIVE PEDAGOGICAL SKILLS

INNOVATIVE PEDAGOGICAL SKILLS

Innovative Pedagogy requires engaging classroom experiences as well as mutual respect between educators and learners. The objective is to assist students in building on existing knowledge and skills, development and design, and provide curricula for educators in a way that is meaningful to students and aligned with their needs and cultures.

Innovative pedagogical skills help the students to make teaching more attractive by developing new ways of education, which allow the teachers and facilitators to achieve their goals. In addition, various innovative pedagogical strategies provide a solid base to improve skills among learners.

"The first step in teaching students is to provide opportunities for teachers to be innovators themselves."

And most importantly,

Teachers that have a passion for education are constantly coming up with innovative ways to instruct their students.

A modernised innovation is one that has been greatly improved, a modified innovation is one that has been marginally adjusted, and an absolute innovation is one that has been

introduced into a new domain (Mynbayeva and Sadvakasova, 2007).

As we are talking about Innovative Pedagogy, various questions float in your minds.....

- HOW SHOULD WE TEACH?
- HOW CAN YOU MAKE THE CLASSROOM A PLACE THAT IS FULL OF MOTIVATION AND ENCOURAGEMENT?
- HOW DO YOU TEACH?

Innovative pedagogical skills can be developed among learners by applying various innovative pedagogical strategies among learners. Innovative pedagogical strategies help the learners to achieve their specific goals.

Innovative Pedagogical strategies are needed because teachers and students are encouraged to study, research, and use all of the available tools in order to discover something new in the classroom. It entails a new way of looking at problems and approaching their resolution. Students' problem-solving abilities and creativity will be enhanced as a result of the thought process that goes into it.

INNOVATIVE PEDAGOGICAL STRATEGIES

There are various innovative pedagogical strategies that a teacher needs to use in their classrooms and out of classrooms (Both Online and Offline; Synchronous and Asynchronous):

- Team Teaching
- Discussion Method
- Cross over Learning
- Based on learning theories
- Incidental Learning'
- Conceptual Learning
- Role-playing
- Creative teaching
- Focused Learning
- Concept Mapping,
- Expert Group Methods
- Context-based learning

- Assessment based learning
- Immediate feedback learning
- Based on the learner's nature
- Learner-Centered
- Independent Projects
- Peer Tutoring
- Based on analytics of Emotions and many more

URGENCY OF INNOVATIVE PEDAGOGY

Due to the reliance on rote memory, rather than thoughtful and analytic learning, creative pedagogical practices are urgently needed among learners. Students' current concentration is on getting good grades rather than understanding the subjects. Team spirit and collaboration are also weak since competition takes precedence over cooperation. The focus should be switched to the learner's particular demands based on their interests and ingenuity. Rather than relying on teachers, more emphasis should be placed on self-paced learning.

As a result, one needs to shift their focus on innovative pedagogical strategies by implementing innovative skills among learners, such as creativity, critical thinking, reasoning, communication, problem-solving, collaborative skills, and other abilities, which are all critical in the current scenario.

What do we need to change?

CHANGING THE TECHNOLOGY OR THE PEDAGOGY?

WHAT IMPACT DOES TECHNOLOGY HAVE ON HOW PEOPLE TEACH AND LEARN?

There is frequently a struggle in online teaching between the value of technology and pedagogy. For some, technology is merely a medium, and education is the primary interest. Others would instead make use of the opportunities provided by technology than wait for theory to catch up. It's probably better to conceive of the two of them as having an interactive conversation. Technology opens up new possibilities and is put to use in ways that its inventors never imagined, driving theoretical development,

which in turn gives feedback into technological development, and so on.

The tension between the role of technology and pedagogy is particularly severe in online education.

Techno-pedagogy is a reflection or suitable link between pedagogy and technology.

The phrase relates to pedagogical (teaching & learning methods, motivation, and the development of students' skills) as well as technology components of (teaching) activities (using computers, the Internet, interactive whiteboards, etc.). Teachers' technical tools, which are targeted and used, are particularly beneficial in supporting active teaching approaches in this regard. They are utilized for educational purposes. As a result, technology is viewed to support functional teaching approaches rather than an end in itself. The common goal of all of these advances is to increase the learning quality of students.

TECHNO-PEDAGOGY

When it comes to judging the success of a piece of instructional media, techno-pedagogy is an important component to consider. What is the exact meaning of this phrase? Both terms are derived from the Latin 'texere,' which means 'art-science of teaching.' Pedagogy literally means 'art-science of teaching,' while 'techno' literally means 'art-skill in handcrafting' (to weave or fabricate). The term 'techno' is used as a qualification in this context, and it overlaps or crosses with the term 'pedagogy.' Using the term "techno-pedagogy," the integration of teaching approaches into the learning environment is defined as follows: Being aware of the mediated learning environment is critical for improving the ease and clarity with which knowledge is transferred to students.

This is a hybrid approach of teaching in which information and communication technology (ICT) is used to facilitate learning situations in the classroom. Techno refers to the art-science of handcrafting, whereas pedagogy refers to the art-science of education in its literal translation. If we use the qualifier "techno" as a prefix, it means that it overlaps or crosses the definition of the word "pedagogy." The term "techno-pedagogy" refers to the process of incorporating the techniques of the craft of teaching into the actual learning environment.

WHAT ARE TECHNO-PEDAGOGICAL SKILLS

Techno-pedagogical skills are the capacity to use technology for pedagogical reasons and integrate it into the classroom. Techno-pedagogical skills include basic technology skills, information acquisition, and personal development, and lesson planning and creation.

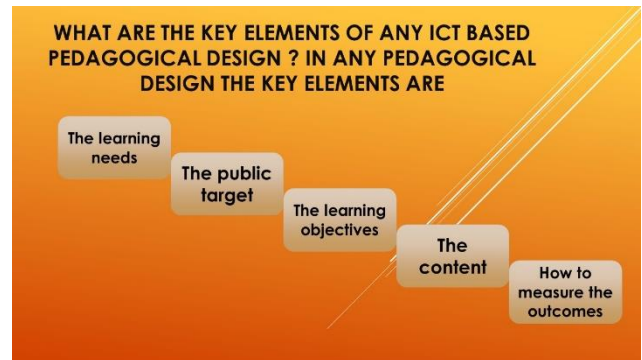


Fig. I: *KEY ELEMENTS OF ICT BASED PEDAGOGICAL DESIGN*



Fig. II: *SPECIFIC ELEMENTS OF ICT BASED PEDAGOGICAL DESIGN*

TECHNOLOGY INTEGRATED MODELS IN PEDAGOGY

When technology is effectively integrated into the curriculum, it has the potential to extend learning significantly. These tools can help students and teachers to:

- gain access to current primary sources,
- collect data
- collaborate with students, teachers, and experts worldwide,
- convey understanding through multimedia, and

- learn how to publish and present their findings.

Technology integrated Models (TIM) have five Characteristics associated with five levels of technology integration, as shown in the below image:

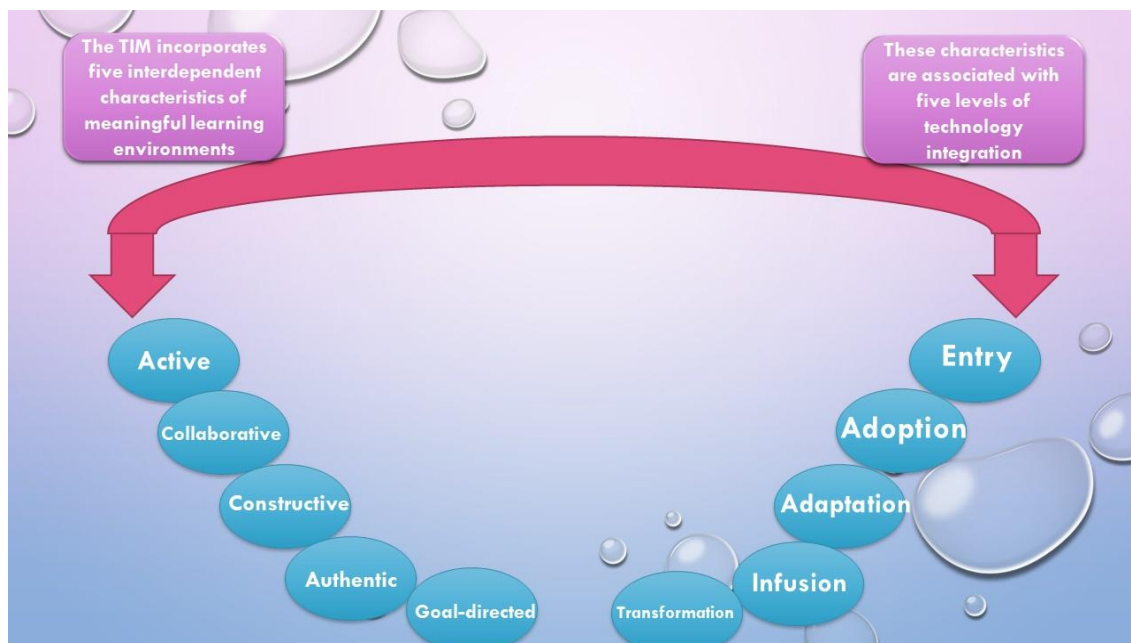


Fig III: *CHARACTERISTICS AND LEVELS OF TECHNOLOGY INTEGRATED MODELS (TIM)*

INNOVATIVE USE OF TECHNO-PEDAGOGICAL SKILLS

Infrastructural upgrade for Techno-pedagogical skills

Human and material infrastructure as well as media culture must be developed. Collages must have technology-friendly rooms or buildings. Phone, cellular phones, fax, radio, television, video, computer, cable network together with internet, e-mail and hardware and software should be available in a pitiful techno-pedagogy supported lab. Also, you must be able to use the internet at any time, and rely on telephone, cable, and internet services.

Develop language and content skills in English

English proficiency has to be improved as it is the prevalent language on the internet. This maximizes the benefits of utilizing the Internet.

Learning to teach with technology

Mediated education necessitates pedagogy. Teacher educators must evolve from pedagogues to techno pedagogue. Micro-teaching, media, and tech-pedagogy skills should be adequately integrated. Thus, teacher educators and teachers should be trained in ICT

literacy and Techno-Pedagogy. There is an urgent need to identify Techno-Pedagogic Skills and train future teachers in these skills.

Remove the teacher shortage of techno-pedagogical talents from the classroom.

Teachers should be involved in the development of specialised techno-pedagogical skills through the use of information and communication technology (ICT) in order to ensure their relevance and efficacy. A thorough understanding of the consequences of technology adoption and use should be included in short and long-term planning where knowledge is lacking.

Teacher rewards are included in this category.

It is necessary to train all those who are involved in the development of techno-pedagogical talents. They should not be concerned about technology taking the role of professors. Teachers' educators should urge teachers to switch from traditional blackboard teaching methods to hybrid, or techno-pedagogical, ways of instruction. When applying technological-pedagogical abilities, it is necessary to provide faculty with prior training.

R&D is addressed in the resolution.

In order to conduct research and development, a sound research foundation is required. It is necessary to create two-way audio and visual communications in order to do this. Students, professors, and professionals should be able to access research and course materials at any time and from any location if a college or university provides digital resources such as digital libraries to their students.

Being aware of the pedagogical services that are currently available

In universities, there are numerous opportunities to include tech-pedagogy into the curriculum. As a result, it appears that teachers are aware of the variety of digital services that are available to them. As a result, all educational institutions should be networked, and low-cost, low-power access devices should be developed.

To avoid such problems, it is necessary to have clearly defined standards and procedures for purchasing computer hardware and software. Unlicensed or pirated software delivered in standard formats should be subject to legal consequences. Because of this, colleges and universities must ensure that they have sufficient equipment maintenance capabilities.

Resources for techno-pedagogy that are never-ending

The sharing of resources and innovations has the potential to reduce development costs. Developing audio cassettes, video films, computer-assisted learning, educational radio, educational television, and web-based instructional material should have been a top priority for the United Nations. Successive media deployment and sustainability policies will be required by both governments and higher education institutions in the coming years. Students' learning outcomes are better when teachers have strong pedagogical skills. Improve departmental coordination

Campuses, colleges, and departments should work effectively together.

As a result, if the university creates separate websites for colleges and departments, they must have cross-references to share information with students. The MHRD, Department of Information Technology, and Department of Telecom will work together to ensure

completely electronic universities and digital campuses.

Reducing frequent power outages

Uninterruptible power supply (UPS) can save data in an emergency. This requires electricity enhancement initiatives such as solar, hydro, wind, wave, or biogas plants to overcome frequent power interruptions and fluctuations.

To develop best practices in E-content generation, dissemination, selection, and evaluation, E-content users and producers must network extensively.

Techno-pedagogical teacher education

Educational Technology (ET) and ICT in Education courses should be given as core courses at all teacher education levels. There may be extended certificate and degree programmes in these areas. ET and ICT should also be given refresher courses. e-lesson All teacher education institutes should promote planning and implementation.

Computing Resource Management Systems

All educational institutions' libraries should have learning resources such as CDs and videos. Libraries must gradually become digital libraries where teachers can combine materials for building a techno-pedagogical frame.

Web page creation

Web pages should be created to teach various subjects using tech-pedagogy.

Various techno-pedagogical skill-based CDs may be generated as web resources.

Promote existing ICT services

A publicity campaign will greatly enhance the impact of comprehensive ICT-based pedagogical skills training. Events (e.g. student orientation, departmental meetings) or platforms (e.g. KNUST, for example, has a vibrant Facebook group).

CONCLUSION

The use of technology in pedagogy is a critical aspect in the development of a hybrid approach to meta-teaching. Around the last two decades, higher education systems all over the world have

begun to incorporate new breakthroughs in techno-pedagogical abilities into their curricula. When techno-pedagogical abilities are used to break down some of the barriers that lead to underachievement, student disaffection, and educational exclusion, the results can be positive (Das, 2007). But when one takes a look around, it is clear that most colleges and institutions across the country are failing to capitalize on their enormous untapped potential. Obvious initiatives to strengthen the role of techno-pedagogical skills in higher education have been given top priority for planning and implementation, an examination of the current situation reveals a number of factors that have been impeding the integration of technology into this sector for quite some time. Aside from technology-related regulations, governments and higher education institutions will need to devise strategies for effective techno-pedagogical skills development, media deployment, and long-term sustainability. Finally, technology will never be a substitute for high-quality instruction.

No electronic delivery system can produce satisfactory outcomes unless the instructors are techno-pedagogically adept.

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