



Techno-pedagogical competency: A hybrid teaching method in 21st century classroom.

Md Hasanuzzaman Miah ^{1*}, Dr. Ramendra Kumar Parhi ²

^{1*}PhD Scholar, Central University of Odisha (CUO) mntkhan96@gmail.com

²Associate Professor (Hod/Ic) Central University of Odisha (CUO)

Citation: Md Hasanuzzaman Miah, et al, (2024), Techno-pedagogical competency: A hybrid teaching method in 21st century classroom., *Educational Administration: Theory and Practice*, 30(1), 1276-1281, Doi: 10.53555/kuey.v30i1.6150

ARTICLE INFO

ABSTRACT

As students in our classroom today face the ever-changing world, it is essential to equip them with skills for dealing with rapid change and unexpected circumstances. Education act as catalyst for the all-round development of an individual, it empower the pupils to meet the emerging needs ; especially Techno pedagogical skills of teachers is vital importance to achieve the objectives of 21st century educational needs in different context. Acquiring this proficiency will make teaching learning environment pleasurable, lessen the pressure of teachers and enable the students plunge deeper into knowledge acquisition process. As the present education system revolves around technologically enhanced learning so, teachers need to understand the values of integration of technology with pedagogy in different context for coping with ever changing learning environment. This paper unveils how to achieve the 21st Century Learning Skills specially 4Cs through Techno-pedagogy.

Keywords: Techno-pedagogical competency, 21ST Century skills, Teaching Method.

*“The technology itself is not transformative. It’s the school, the pedagogy that is transformative.”
(Tanya Byron).*

Introduction:

The 21st century is an age of knowledge explosion and exploration. Rapid progress in computer technology has invaded the arena of education. Technology has a significant effect on the education system for many years. In recent years there has been a groundswell of interest in how computers and the internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non formal settings. It’s time for teachers to take different approach to education in order to fulfill the needs of the 21st century students. Many technology applications in teaching offer the teachers a way in understanding the capacity of knowledge of their own self as well as the students and enable them to explore that to what extent they can work in bringing desirable changes during teaching-learning process. Techno-pedagogy can be considered as the weaving of the technologies of the craft of teaching into the learning environment itself. It requires conscious recognition of the mediated learning environment in order to maximize the ease and clarity in the transmission of information.

The effective use of technological advancements in the classroom does not only help student’s growth and achievements but also it also motivates and provides an opportunity in changing the role of teachers in the classroom. Also the use of technology in teaching-learning gives teachers the opportunity to give special attention to every student. It increases interaction and interest level among the students making them an active learner. It also helps the students to imagine and complete the things that are being taught with the help of technology. Technology equipped classroom help both teachers and students to have access to constant information than the past generations. So, teachers needs to develop the techno-Pedagogical competencies in order to meet the ever changing challenges and needs of the students as well as the whole education system.

Teacher’s perception regarding technology in the context of 21st century:

The development of technology in the context of 21th century, the education system has changed dramatically. That is because of the professionalism of providing a functional, easy-to-access place with

complete teaching and learning space. Nowadays, the education system worldwide offers a wide range of fields and training to improve the use of advanced technology in the teaching and learning process. A major budget has been set apart to provide the equipment needed for teachers to improve the education system.

Despite all efforts, most countries are facing the same problem of teachers not using the technology provided (Albirini, 2006). This has become a serious issue as many previous researchers have shown that the use of ICT in the teaching and learning process can enhance student achievement (Nakayima, 2011 and Jamieson-Proctor et al., 2013). Mostly, researchers have taken the effort to analyze factors affecting teacher recognition of the use of technology in classrooms (Capan, 2012; Virkus, 2008; Zhang, 2013; Dudeney, 2010). It shows that the basic obstacle to implementation was the teacher's belief as teachers are each successful and talented individual in the exchange of their teaching and learning process. Also, previous research (Cassim and Obono, 2011) shows that the correlation between teacher belief and ICT use are excessive. The role of teachers is particularly important in the use of technology in pedagogy that can enhance students' achievement, creative skills, and thinking skills. Finally, techno-pedagogical skills in the classroom need more attention to develop the skills of the secular education system. This would help to raise the global standard for education and produce better citizen for the future. Therefore to increase the use of technology in the classroom, the government should wish to expand and transform teachers' beliefs about technology integration in the classroom (Saravanakumar AR., and Jazeel, 2014). As a teachers role is the most important role in making any new policy is effectively and efficiently implemented. The changes that are taking place are driven by improved technology and communication devices that should be available to students wherever you are at school or home. Also, wishes for teachers to be literate and have good skills and knowledge in using technology to improve their teaching methods and approaches are preferred to promote effective learning as an addition to satisfying the need for 21st-century teaching skills.

Why and How the concept techno-pedagogical skill is required for 21st century's classroom:-

In the present education system teacher is at the forefront of education and arts in the pyramid building. Technology is the broad and flexible set of processes that requires intelligence and choosing the right techno-pedagogical strategies to effectively engage students in content is a unique set of issues. Media texts contribute to student's development, and the growing use of critical media is a critical skill for student. In understanding how technology and media interact with learning, considered the correlation between technology concept and education, and how that relates to the content. There may be a need for instructors and an institutional level, to select and clarify work truths where technology and skills interact while understanding and communicating how technological resources and strategies can engage students and improve student learning (Saravanakumar AR, Paavizhi, K., and Palanisamy, P., 2019).

Technology promotes effective, user centric, interdisciplinary, self-paced, real time teaching. It meets the needs of individual learners and is applicable for all learning methods. Therefore its widely used for teaching purpose in the education sector. It encourages the students to develop higher level of thinking skill, such as analysis, synthesis, application and creation which are very important to our to-days competitive world.

Teachers today must understand Techno-pedagogy and its applications in the teaching process. They should know how to successfully incorporate the Techno-pedagogy in to their subject while planning course and providing learning experiences. The selected technology assets should complement educator's information's and help learners for their quality constructions of knowledge. Technical teaching capabilities enable classroom educators to teach topics more effectively by focusing on personal needs in an inclusive manner. It enables the learners to fully grasp the concepts in way that better maintains the learned concepts. Mastering the level of professional teaching will make teaching enjoyable because it will reduce the burden n teachers and enable students to remember more deeply.

Techno- Pedagogical Competency:

➤ Technological competency

In general Competency means the ability to do something successfully or efficiently. Competency is defined as "adequate for the purpose, suitable, sufficient or as legally qualified, admissible or as capable". The synonyms of competency are capability, ability, proficiency, expertise, skill etc. Just as other professionals utilize specific technologies as tools to enhance their work, teachers must likewise become adapt in putting technology to use as the field of educational software evolves with the various academic disciplines. Technology can support teachers in numerous professional activities first and foremost in stimulating learning beyond the classroom and also develop our knowledge about working with technology, tools and resources and working with technology can apply to all technology tools and resources.

➤ Pedagogy

Pedagogy is the discipline that deals with the theory and practice of teaching. Pedagogy is derived from two Greek words "paid and agogos". "paid" means child and "agogos" means leading. So the term pedagogy literally means "to lead the child". Thus pedagogy has been defined as the art and science of teaching children. So pedagogy is the art or profession of teaching and preparatory training or instruction. It is a master plan that includes a detailed analysis of what is to be done by a teacher. Pedagogy informs teaching strategies, teacher actions, and teacher judgments and decisions by taking into consideration theories of

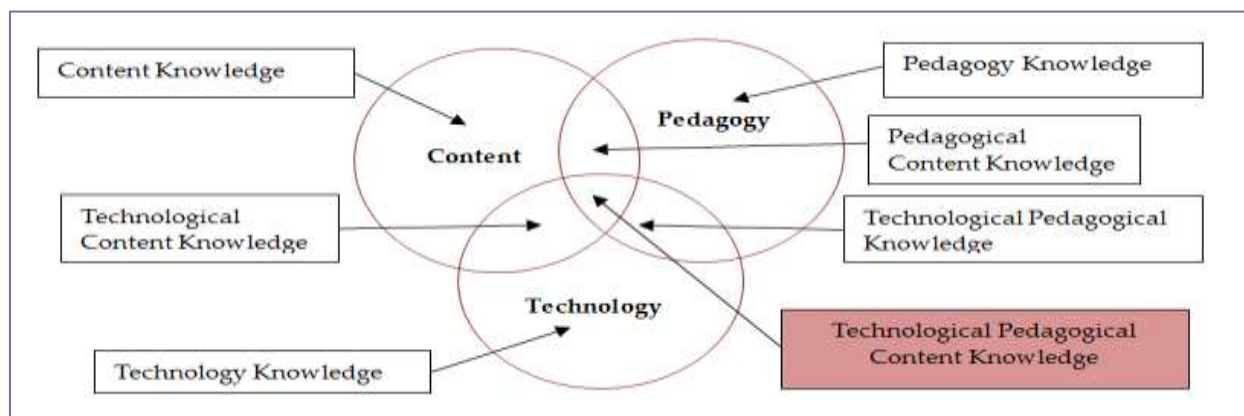
learning, understanding of students and their needs, and the backgrounds and interests of individual students. Different types of Pedagogical Approach are as follows; Khan's (2000) listed 20 major "natural types" that he developed under the head "pedagogical" in his eight-components framework for e-learning, like Presentation, Exhibits, Demonstration, Drill and Practice, Tutorials, Games, Story Telling, Simulations, Role-playing, Discussion, Interaction, Modeling, Facilitation, Collaboration, Debate, Field Trips, Apprenticeship, Case Studies, Generative Development, and Motivation.

➤ Pedagogical competency

Pedagogy is an art of teaching. Some strategies are better suited for teaching certain skills and knowledge than others. Some strategies are better suited considering students' background, learning strategies and abilities (Notify-RSS, 2002). The use of best pedagogy in the classroom encourages the well-being of the individual as well as community. Pedagogical competency is much more than verbal communication. It includes knowledge about different "alternatives instructional methods". Pedagogical competence also means the teaching and educational qualification of teachers and while assessing the pedagogical competency, the quality of teaching should be the prime concern of each person. Pedagogical competence is based on sound, broad and current knowledge within the subject area, as well as knowledge of student learning and subject-based teaching and learning issues.

➤ Techno-pedagogical competency

This is the hybrid method of teaching in which techno-pedagogy is used for teaching learning situation. It is the skills of the teachers effectively integrate and technology and pedagogy in the classroom and teachers having competency in technopedagogy integration can bring the entire world in the classroom. Techno-pedagogical competency is the ability of teachers to make use of technology effectively in teaching. A teacher having the competency in technology and pedagogy is required to have knowledge of the all existence, component, and capability of various technologies used in teaching and learning settings. For example, rather than adopting a face to face interaction in co-operative learning an individual can it effective by taking the help of Google Docs or Google hangouts. The advancement in technopedagogical knowledge has given birth to latest concept of online learning. LMS, MOOCs, MOODLE are best examples of incorporating the technical knowledge in pedagogy. 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.



Source-TPACK framework and knowledge components (Koehler and Mishra, 2008)

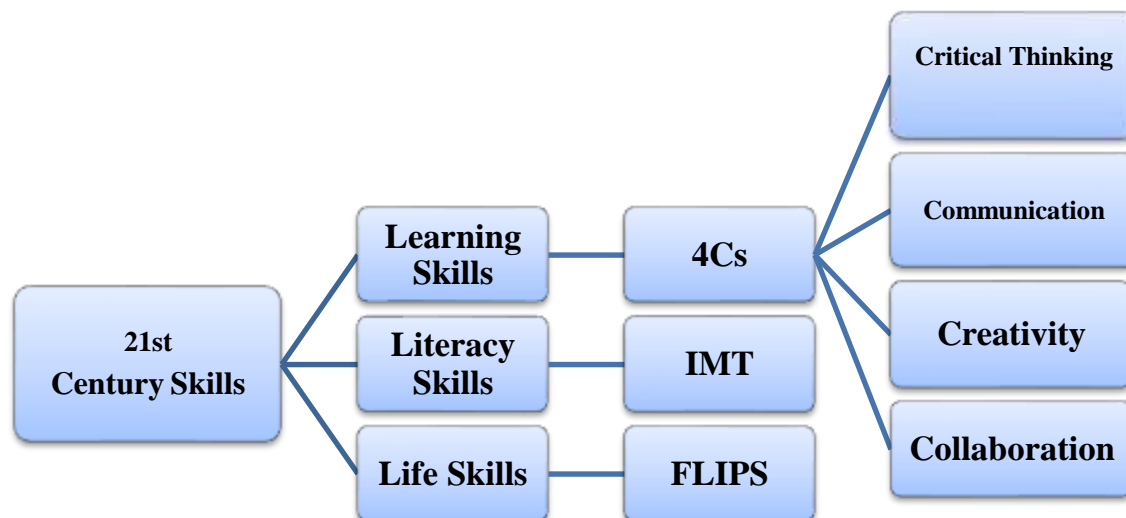
Need and Importance of Techno Pedagogy Competency:

- 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.
- Techno pedagogical competency needs to be improved in order to equip teachers to face the students. 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.

- Pedagogical knowledge is deep knowledge about the processes and practices or methods of teaching and learning and how it encompasses, among other things, overall educational purposes, values, and aims. This is a generic form of knowledge that is involved in all issues of student learning, lesson plan development and implementation, and student evaluation. It includes knowledge about techniques or methods to be used in the classroom; the nature of the target audience; and strategies for evaluating student understanding.
- A teacher with pedagogical knowledge understands how students construct knowledge, acquire skills, and develop habits of mind and positive dispositions toward learning. As such, pedagogical knowledge requires an understanding of cognitive, social, and developmental theories of learning and how they apply to students in their classroom.
- Pedagogical knowledge is the set of skills that teachers must develop in order to manage and organize teaching and learning activities for intended learning outcomes. This knowledge involves, understanding how students learn, understanding of classroom management activities, the role of student motivation, lesson planning, using teaching and learning instructional aids and assessment of learning.

In 21st century skills through Techno- pedagogy:

Acquiring techno-pedagogical proficiencies will make teaching and learning a pleasurable exercise as it would lessen the pressure on the teachers and enable the students to delve deeper into domain of knowledge. Technology had made inroads into every sphere of human activity, including the field of education. It had totally transformed the face of didactic teaching and brought about far reaching changes in the way in which knowledge was being shared. As the Teachers knew the significance of technology as it had made easier for students to understand. When it came to teaching theories, the Teachers should give up the mechanical approach and make it interesting by simulating problems and finding solutions to such imaginary issues. In such a context, the terms “pleasure and pressure” should not get blurred and the distinction could be kept intact if the teachers with appropriate techno-pedagogical skills make teaching a “pleasurable” experience without feeling much of “pressure”.



Critical Thinking:

Critical thinking in 21st century has been recognized as a skill for citizens. Critical thinking is define as the intellectual thinking skills like analyzing, reasoning, problem solving, creative thinking, making judgment and good decision maker. One way to enhance critical thinking skill is by Techno-pedagogy and it is already widely utilized modern teaching method in the 21st century class room.

The “Critical Thinking” technology teaches the independent search for new knowledge, uses student dialogue, creates a psychologically comfortable environment, since in the lesson it is allowed to make mistakes, to be mistaken, and then there is an opportunity to correct their mistakes.

Technology offers many forms of working with educational material. A feature of these techniques is the independent search activity of students. This allows you to use this technology at various stages of the lesson.

- To improve your critical thinking, you need to be able to filter, verify, and synthesize the information we find online. You can use search engines, databases, and online libraries to find credible and authoritative sources, such as academic journals, reputable news outlets, or official organizations.
- To improve your critical thinking is to use digital tools and platforms to collaborate and communicate with others. Technology enables you to connect, share, and exchange ideas with people from different backgrounds, cultures, and disciplines. You can use social media, online forums, blogs, podcasts, or webinars to engage in discussions, debates, or feedback sessions with others who have different opinions, experiences, or expertise.
- To improve your critical thinking is to practice and test your skills through online games and simulations. Technology offers you a variety of interactive and immersive experiences that can stimulate your brain, challenge your logic, and enhance your creativity.
- To improve your critical thinking is to reflect and evaluate your own thinking process and outcomes. Technology can help you to monitor, document, and review your own thinking patterns, habits, and biases.

Communication:

Communication is an essential 21st century skills. 21st century learners are able to effectively share or exchange information, news, or ideas orally, in writing and using a variety of digital tools and also hone superb listening skills (Fullan, 2013). Most of today's communication takes place using digital tools and resources. It is important that students explore these tools and encourage these interactions.

Utilizing video discussion software allows each student to share their voice by having those record short, authentic videos and replying to one another's posts. Creating websites and blogs can support student and teacher learning by facilitating reflection, questioning by self and others, collaborating and by providing context for engaging in higher-order thinking. With all the available communication tools, it now becomes important for students to learn how to effectively use these forms of communication and help them to distinguish which platform best suits their needs.

Students should work collaboratively to solve problems and build upon previous knowledge by actively interacting and sharing experiences. Creating a community of learners allows for students to draw upon and share what they already know and work together to think, apply, and create new knowledge (Donovan, Bransford, & Pellegrino, 2002).

Creativity:

The rapid pace of new technology development has presented a challenge for classroom technology integration (Zhao, 2012). Creativity is deeply connected to issues of technology integration, so these issues of creativity and technology can be considered collectively. While new technologies and discoveries have been a constant through human history, digital technologies rapidly scale up the technological growth.

We have seen an incredible blossoming of creativity and innovation fuelled by the capabilities of such technologies. From Google to Facebook, from cloud computing to YouTube channels, digitalism has altered how we live, work and connect with each other (Mishra & Henriksen, 2013).

Technological change is driven by human creativity, and in turn provides new contexts and tools for creative output. Given this reciprocal relationship between creativity and technology we suggest that teaching and learning must emphasize their connection (Henriksen, Hoelting, & The Deep-Play Research Group, 2016). Creative teaching alone is a complex and open-ended arena. Incorporating effective uses of technology for teaching is also complex on its own terms. So things become more complex when these two intersect, as they must in 21st century classrooms. It is important to explore the relationship between these constructs across varied, global educational contexts.

Contemporary technologies often bring new possibilities for people to be creative. In classroom terms teachers must understand the range of ways in which technology can present content creatively, and see how this intersects with different pedagogies. Since technologies emerge and shift continuously, a tool-based focus is akin to a moving target. Creative real-world approaches to teaching might allow us to also consider how technology helps us view and learn content in original or compelling ways.

It allows us to create content, rather than summarize and repeat it.

Collaboration:

Collaboration is the ability to effectively work with others. This skill involves working together while taking actions, respecting others' needs and perspectives and contributing to and accepting the final outcomes. Collaboration helps to develop interest and fun in the teaching learning process.

It effectively broadens the cultural, social, and environmental boundaries and helps a child to understand social and environmental concerns better.

Students can use cloud-based services that allow you to email, chat, video conference, and create real-time document collaborations by incorporating real time audience participation, online brainstorming and

classroom feedback. The ability to work together, learn from one another and help to teach each other is a very important 21st century skill.

By utilizing social networking skills and encouraging collaboration this allows students to show empathy to others and work together in diverse environments (Fullan, 2013).

Social learning requires students to develop collective intelligence and to co-construct meaning. Social learning applications allow students to collaborate digitally and contribute to the collective knowledge base.

Using student engagement platforms or social media applications in the classroom enhances active engagement among the learners and allows them the opportunity to talk to peers, present and defend ideas, as well as allows them to exchange and question diverse opinions and beliefs (Bloom, Krathwohl, & Masia, 1956).

Collaborative learning is an essential part of active learning. Ultimately, the combination of active collaborative learning with technology has proven to enhance student academic performance.

Conclusion:

The global market is driven by creativity and innovation. The 21st century teachers have a civic and academic responsibility to teach students the 4C's where utilizing hybrid method of teaching which provides a logical, efficient means to better prepare learners for global citizenry.

I highlighted in this research paper that, How to improve 21st century skills especially 4C's through techno-pedagogical skills.

Technology need to be integrated to achieve the best quality pedagogy. Lots of technology is used in teaching in the modern classroom. Teachers need to teach students how to think critically by scaffolding higher levels of thinking to posed problems, instruct and role play appropriate communication skills with a special focus on netiquette, and to cultivate and encourage creativity and innovation by exploring ideas and various forms of artistic expression. Our nation's education is at a crossroads.

It is time to embrace the technological pace and 21st century skills students need in order to be successful and competent global citizens.

References:

1. Taopan, L.L., Drajeti, A.N., & Sumardi, S. (2020). TPACK framework: challenges and opportunities in efl classrooms. *Research and Innovation in Language Learning*, 3(1), 1-22. Amarjeet Kaur Malhotra, (2017). "Digital Education in India". CEC News. 18(03): 3-7
2. Suparna Naskar, (2016). "Digital Library Initiatives in India: an Overview" *Conference Paper*.
3. Kporyi, E. (2020). Teachers pedagogical practices vis-a-vis academic achievement of Senior High school students in Ada East District, Ghana. *International Journal of Social Science and Human Research*, 03(12). doi:10.47191/ijsshr/v3-i12-04
4. Bala, P., & Kokla, I. (2018). Techno-pedagogical competence among senior Secondary School Teachers. *Indian Journal of Public Health Research & Development*, 9(12), 1693. doi:10.5958/0976-5506.2018.02234.9
5. Henriksen, D., Mishra, P., & Fisser, P. (2016). Infusing Creativity and Technology in 21st Century Education: A Systemic View for Change. *Educational Technology & Society*, 19 (3), 27-37.
6. Narayanan, A. L., & Komalavalli, T. (2022). Integration of techno-pedagogical skills in teacher education to enhance employability skills among prospective teachers. *SCHOLARLY RESEARCH JOURNAL FOR INTERDISCIPLINARY STUDIES*, 10(73), 17642-17646. doi:10.21922/srjis.v10i73.11666
7. Pandya, B., Patterson, L., & Cho, B. (2021). Pedagogical transitions experienced by higher education faculty members – "Pre-covid to covid." *Journal of Applied Research in Higher Education*, 14(3), 987-1006. doi:10.1108/jarhe-01-2021-0028
8. Afalla, B. T., & Fabelico, F. L. (2020). Pre-service teachers' pedagogical competence and teaching efficiency. *Journal of Critical Reviews*, 7(11). doi:10.31838/jcr.07.11.36
9. Kolyvas, S., & Nikiforos, S. (2021). Technology and creativity on early adolescence: A case study during COVID-19 pandemic. *Current Psychology*, 42(10), 8554-8561. doi:10.1007/s12144-021-02349-4
10. Mason, J. (2022). Retrieved from <https://www.weareteachers.com/school-leaders-tech-creativity/>
11. Friedman, S. (n.d.). Retrieved from <https://thejournal.com/articles/2019/10/31/using-technology-to-inspire-creativity-boosts-student-outcomes.aspx>
12. Jessica Mansbach More posts by. (2020). Retrieved from <https://dl.sps.northwestern.edu/blog/2015/09/using-technology-to-develop-students-critical-thinking-skills/>
13. Cannon, A. (2019). Retrieved from [https://pressbooks.pub/techandcurr2019/chapter/essential-skills-and-collaboration/#:~:text=The%20ability%20to%20work%20together,environments%20\(Fullan%2C%202013\).](https://pressbooks.pub/techandcurr2019/chapter/essential-skills-and-collaboration/#:~:text=The%20ability%20to%20work%20together,environments%20(Fullan%2C%202013).)