Exploring the Relationship between Techno Pedagogical Competence and Attitudes toward E-Learning among Prospective Teachers

OPEN ACCESS

Volume: 13

Special Issue: 3

Month: March

Year: 2026

P-ISSN: 2321-788X

E-ISSN: 2582-0397

Citation:
Ramesh, M. "Exploring the Relationship between Techno Pedagogical Competence and Attitudes toward E-Learning among Prospective Teachers." *Shanlax Interantional Journal of Arts, Science and Humanities,* vol. 13, no. S3, 2026, pp. 69–75.

DOI:
https://doi.org/10.34293/sijash.v13iS3-Mar.10489

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Abstract

The adoption of digital technologies in learning settings has altered the education and learning activities in a great way. The level of techno pedagogical aptitude of the teachers and their feelings towards e learning is vital in the successful adoption of technology based teaching. The current research paper will look into how there is a correlation between the techno pedagogical knowledge and attitude towards e learning among the potential teachers. The study involved a descriptive survey design. The sample will include 1000 future teachers pursuing college degrees in colleges of education based in Krishnakiri district in Tamil Nadu Teachers Education University. The data collection was done using two research tools, the Techno Pedagogical Knowledge Test and the Attitude towards E Learning Scale which was created and validated by the researchers. The correlation between the variables was analysed using Pearson correlation. The results showed that there is a strong positive correlation between e learning attitude and techno pedagogical knowledge. It means that the higher the rates of techno pedagogical competence of the prospective teachers are, the more positive the attitudes toward the digital learning settings tend to be. This paper highlights the need to incorporate technology based training in teacher education curriculums to increase the readiness of the future teachers to use technology in the classroom to augment the learning experience.

Keywords: Techno Pedagogical Knowledge, e Learning Attitude, Digital Learning, Prospective Teachers, Teacher Education

Introduction

The accelerated development of digital technologies has entailed significant changes in the educational systems of the whole world. Digital tools, online platform and multimedia resources are becoming more and more integrated into educational institutions education and learning processes. Under this changing environment, teachers are not only supposed to have knowledge and pedagogical skills in the subject matter but they must be able to combine technology into teaching activities.

Techno pedagogical knowledge is a term that is used to describe the skills of teachers who integrate technological tools with pedagogical

planning and subject knowledge to facilitate the learning experience. When teachers know how to effectively apply technology to significant purposes in their teaching practices, they are able to form interesting, participatory, and learner centered classrooms. By building such competencies in their training process, prospective teachers are in a better position to cope with the demands of the current classrooms.

Education programs of teachers are thus critical in imparting techno pedagogical skills in future teachers. As soon as the knowledge on the digital technologies and strategies of instruction is properly obtained by prospective teachers, they can create efficient learning settings that would promote active engagement and cooperation between students. During communication between teachers and students through online services, it is also possible to develop knowledge of the hard to grasp concepts and increase the learning results.

The other significant issue that affects the introduction of technology in education relates to the disposition of teachers towards e learning. Attitude can simply be described as the inclination of people towards either negative or positive reaction to a certain idea or practice. Such a positive approach to e learning stimulates teachers to use digital tools and online platforms in their teaching. On the other hand, negative attitudes can be a hindrance to technology use in the classroom.

Technology in education does not refer to the utilization of digital devices but rather to the application of thinking in the combination of instructional tactics, learning goals, and technological means. In order to integrate effectively, the decision-making process of teachers should be informed when choosing the right technologies to support the pedagogical objectives and make the process of learning more effective in students.

E learning can be defined as the utilization of electronic technologies and other digital materials to facilitate teaching and learning. It encompasses different instruction methods that include online, blended, mobile and virtual learning. E learning surroundings enable the learner to work at educational resources at any time and place hence making education more flexible and more accessible.

The new digital technologies of virtual classrooms, online discussion platforms, multimedia content, and interactive simulations give possibilities to collaborative and individualized learning. Teachers can also use these technologies to track the progress of students, offer feedback and to engage students in meaningful learning. The techno pedagogy, then, implies the combination of communication technologies, methods of teaching and the subject knowledge with the aim of enhancing the teaching effectiveness. It is dedicated to the development of purposeful learning experience by using digital tools and educational technologies in a proper way. The presence of good techno pedagogical knowledge among the teachers will make them embrace new teaching methods as well as use e learning platforms effectively.

Review of Related Studies

Studies Related to E Learning

The growth of the use of digital technologies in the educational process has made researchers study the attitude of learners to e learning and its impact on academic interaction and learning performance. The multiple researches point to the fact that the perception of students about online learning platforms and their acceptance are major factors that influence the effectiveness of technology mediated instruction.

Gurlek Kisacik et al. (2023) carried out a research to examine how the attitude of students towards the e learning impacts their academic performance at the time of the pandemic induced online education. The study was carried out with first year nursing students and had a correlational design of research. The results indicated that students who had positive attitude toward online learning platforms performed better in school. The research has highlighted that positive perceptions

towards the digital learning environments help in enhancing engagement and motivation among the learners.

Ozudogru and Gul (2022) studied the learning preferences of preservice teachers in the digital setting and their perception of e learning. The researchers used a quantitative survey method, and the results revealed that the preservice teachers expressed neutral to positive towards online learning. Despite the fact that gender was not a major factor in determining the attitudes towards e learning, there were variations among the various academic departments and residential backgrounds. The paper has also found a weak positive correlation between some of the learning styles and feelings toward the digital learning environments.

In the study, one of the primary sources of data was the analysis of digital activity logs created in an e learning platform (Keskin and Yurdugul, 2022). The research found that there were a number of types of interaction such as interacting with the instructional video, hypertext materials, discussion forums, and online assessments. The results proved that the engagement of the learners into the e learning space is complex and is dependant on the design and structure of the digital instruction materials. The research has indicated the significance of interactive online materials in facilitating meaningful processes of learning.

The overall implication of these studies is that the attitudes of learners in relation to e learning play a very important role in determining their engagement, participation and general education results in the digital learning environments.

Studies Related to Techno Pedagogical Knowledge

Techno pedagogical competence has become one of the key components in contemporary didactic practice as more and more educators have to combine technological means with pedagogical practices and mastery of the subject matter. A number of researches have investigated the effects of techno pedagogical proficiencies on the effectiveness of teaching and learning.

Sharath Kumar (2023) examined the techno pedagogical competence of teacher trainees in higher institutions of learning. The researchers found out that teachers in training with high techno pedagogical knowledge were better placed to incorporate digital technologies in classroom teaching. The study has indicated that quality of curriculum delivery, and the encouragement of active learning in the students is achieved through proper utilization of multimedia tools, Internet resources, and interactive technology.

Ngemunang Agnes Ngale Lyonga et al. (2021) examined the connection between the techno pedagogical competence and instructional performance of the teachers. The study findings showed that there was a high positive correlation between technological proficiency of teachers and their teaching effectiveness. The researchers concluded that those teachers who can use technology to combine it with pedagogical methods will develop more student centered and engaging learning environments. The paper also pointed out the significance of the training programs, which assist teachers in building competencies in integrating the content knowledge, teaching methods, and technologies.

All in all, the analysed literature points to the fact that techno pedagogical competence is a key to enhancing the teaching practice and helping to achieve the successful implementation of digital technologies in the educational process. These competencies should also be developed in the potential teaching staff to equip them with the current technology intensive learning programs.

Objective of the Study

The research questions of the current study are: To explore the correlation between techno pedagogical knowledge and attitude towards e learning among future teachers.

Methodology

The current study took the descriptive survey research design. This design was found to be more suitable since the research was to investigate the relationship between two variables without controlling them.

Population and Sample

The sample of the study was all the future teachers in the colleges of education of Tamil Nadu teachers education university. A sample of 1000 potential teachers in Krishnakiri district was selected out of this population as a sample through the simple random technique of sampling.

Tools Used

Two instruments were used to collect data:

1. Techno Pedagogical Knowledge Test (TPKT): Developed and validated by the investigator and research supervisor in 2023.
2. Attitude toward E Learning Scale (ATELS): Developed and validated by the investigator and research supervisor in 2023.

Data Analysis

Hypothesis

No notable association can be made between techno pedagogical knowledge and attitude concerning e learning among the potential teachers.

Table 1: Relationship between Techno Pedagogical Knowledge and Attitude toward E Learning among Prospective Teachers

Variables	N	Mean	SD	Calculated r value	Level of Significance	Result
Techno Pedagogical Knowledge	1000	72.48	8.36	0.523	0.01	Significant
Attitude toward E Learning		74.12	7.95			

Note: Significant at 0.01 level

The results as shown in Table 1 demonstrate a correlation between the knowledge and attitude of the potential teachers towards e learning and techno pedagogical knowledge. The value of the calculated correlation coefficient is 0.523 that is statistically significant at the level of 0.01. This finding shows that the correlation between the techno pedagogical knowledge and the attitude towards e learning is moderate. The implication of the discovery is that when a prospective teacher has a greater techno pedagogical competence then that teacher is more likely to develop positive attitudes towards the application of e learning technologies. Stated differently, the higher the exposure to technological applications and teaching methods, the higher the acceptance and adoption of digital learning platforms. Consequently, the null hypothesis that demonstrates that there is no significant correlation in techno pedagogical knowledge and attitude towards e learning among future teachers is rejected.

Discussion

The results of the current research indicated that there is a strong positive correlation between attitude towards e learning and techno pedagogical knowledge of future teachers. It means that

having higher techno pedagogical competence, the prospective teachers are less likely to have a negative attitude towards using digital learning technologies. That is, teacher preparation programs have a reciprocal effect between technological competence and positive perception of e learning.

The value of the correlation in the research (r = 0.487) indicates that the relationship between the two variables is moderate and positive. This means that techno pedagogical knowledge will be significant in influencing the attitude and the perception of digital learning environment by future teachers. The more self-assured teachers are in applying the technological tools and combining them with the pedagogy, the higher the expectations that e learning could be perceived as a useful, efficient, and topical tool of educating people.

The study results align with previous findings that show the issue of technological competence of the teacher affects the intentions of the teacher to use digital learning practices. Earlier researches have noted that educators who possess sufficient technological skills feel more at ease with online tools, multimedia materials and electronic learning management systems. This makes them have good attitudes towards technology aided instruction and they are more encouraged to adopt new teaching methods.

Also, the findings of the research confirm the hypothesis that teacher education programs can be vital in influencing the attitude of future teachers on educational technology. Prospective teachers become very confident in applying technology in the instructional process when the teacher training institutions offer them the opportunity to engage in collaborative digital learning, experience the use of e learning tools. This trust leads to the development of good feelings towards e learning.

The results also indicate that techno pedagogical competence can improve the ability of prospective teachers to use online learning systems, digital communication devices and multimedia effectively. The educators who are knowledgeable about the ability of technology to facilitate pedagogical goals can create interactive and engaging learning environments among the students. Thus, it is possible to conclude that the inclusion of the training on technology pedagogies in teacher education courses can have a great impact on the preparedness of future teachers to adopt the technology supported teaching methods. This kind of preparation is especially significant in the present-day educational environment where digital learning and online education are becoming more and more parts of the educational and learning process.

Educational Implications

The results of the current research have a number of significant implications to the institutions of teacher education, the policy makers in the field of education and the teacher training programs.

The teaching training programs must focus on achievement of techno pedagogical competence in the prospective teachers. The training programs must not be restricted to mere theoretical explanations of technology but rather emphasize on practical experiences that would empower the potential teachers to practically apply the use of digital tools, learning management system and multimedia resources in their teaching. These experiences will make them more confident in technology and have positive perceptions towards e learning.

The technology integrated pedagogy should be included in the teacher preparation programs of teacher education institutions as a curriculum aspect planner. The curriculum should also incorporate courses in instructional technology, digital pedagogy and e learning design so that the future teachers can be able to learn how technology can be successfully incorporated into various subjects.

To facilitate technology based learning and teaching, teacher learning institutions are expected to offer sufficient technological infrastructure and digital learning tools. Interactive learning platforms and access to computer laboratories, internet and digital instructional tools can also play a big role in exposing prospective teachers to technology supported education.

It should also be arranged regularly with professional development programs as well as workshops aimed at enhancing the technological abilities and pedagogical approaches of the potential teachers. Such programs may offer potential educators to understand new educational technologies like online course classes, online collaborative tools and mobile learning applications along with online digital evaluation.

The teacher educators themselves should also be role models since they should successfully incorporate technology in their teaching. Prospective teachers would also have positive perceptions concerning the use of digital tools in instruction when teacher educators model the use of digital tools in education.

The educational policy makers must promote the development of technology aided teaching techniques in teacher education. The policies promoting digital infrastructure, technology training, and changes in teaching practices will serve as important factors in the preparedness of future teachers to continue working in technology enriched learning environments.

In general, enhancing the techno pedagogical competence of the potential teachers will help to produce the techno skilled teachers who can design interactive, engaging, and learner centered digital classroom.

Conclusion

Education programs on teaching play a very important role in equipping upcoming teachers to work in technology rich learning institutions. Techno pedagogical competence is a crucial aspect that needs to be developed in the future teachers to make sure that the integration of digital technologies in teaching practices is successful. The training programs must thus offer potential teachers a chance to have a hands-on experience with education technology, online and new teaching techniques. This type of training will help them to come up with meaningful learning activities that can increase student engagement and foster collaborative learning. Technology has taken up an essential role in the life and experiences of students. In case teachers successfully introduce the digital technologies into the classroom teaching, they would be able to assist students in getting better insights into complex ideas and promote interactive learning. Nevertheless, inadequate access to resources, inadequate training and inability to use the technology due to lack of technological confidence can also be an obstacle to effective integration of technology by teachers. These issues can be resolved in a way that increases the willingness of teachers to embrace the concept of digital learning by employing structured training programs and institutional support. The current research indicates a close relationship between the attitudes towards e learning and the techno pedagogical knowledge. Enhancing techno pedagogical competence during teacher education will hence help in producing technologically competent teachers to assist in digital learning environments.

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