



TEACHING COMPETENCY OF SCIENCE AND ARTS TEACHERS IN USING TECHNO PEDAGOGICAL SKILLS

JUTHUKA KALAVATHI¹, SHAIK FATHIMA², Dr.T.SHARON RAJU³

¹Research Scholar, Ph.D in Education (Part-Time), Andhra University, Visakhapatnam, Andhra Pradesh.

²Principal, M.R.College of Education, Vizianagaram, Andhra Pradesh.

³Associate and Head, Department of Education, Andhra University, Visakhapatnam, Andhra Pradesh.

Abstract

The study was conducted to find out the techno-pedagogical skills of teacher trainees belonging to arts and science streams. A simple random sample of 100 teacher trainees was taken, out of which 50 Science and 50 Arts students were selected. The study was taken in two districts of Visakhapatnam. Self-prepared Questionnaire and interview schedule were used to study the techno-pedagogical skills of teacher trainees. The study is qualitative as well as quantitative in nature. The researcher used Descriptive survey method of research. Percentage, mean, standard deviation and t-test were used to analyse the data. The finding of the research confirms that the teacher trainees belonging to arts streams have low techno-pedagogical skills than the teacher trainees related to science stream. This study is very beneficial for the teacher educators to plan the activities and engagement practices in such a way that every stream should equally indulge in using more and more techno pedagogical skills in delivering lesson in the classroom. Techno-pedagogical skills now-a-days, in such a pandemic situation became the need of the hour. This study will not only help teacher educators, teacher trainees but many other professionals to have an insight about the effective usage of techno-pedagogical skills in daily Instruction and major thrust areas to be focussed upon for effective utilization of techno-pedagogical skills in different aspects of life.

Key words: classroom, implementation, Techno-pedagogical skills, teacher trainees.

DOI Number: 10.48047/NQ.2022.20.15.NQ88808

Neuroquantology 2022; 20(15):8132-8138

Introduction

The rapid expansion of knowledge society demands such teaching wherein teacher applies modern technologies in their teaching. Mere introduction of technology at school and college level is not sufficient. The implementation of technology in educational process will bring appropriate changes and development in educational scenario and technology as well (Bala & Tao, 2018). Techno-pedagogy helps the stakeholders in case these are properly utilized became a boon for all. But, lack of knowledge, attitude and skills

are the major constrain in its proper utilization and application (Kumar, 2018). One of the most influential factors that contributes largely to the educational development and advancement of technology is the teacher. Teacher's potential to integrate technology in the pedagogical practices provides enormous changes in pedagogical discourses. Therefore, the main focus of teacher training is to cultivate and develop such skills, knowledge and understanding among prospective teacher trainees for integrating appropriate technology in correct manner. Thus, teacher

8132



with his/her expertise make it easier to learn and understand various concepts for the students (Gloria & Benjamin, 2018). Every teacher should have proper knowledge and training of how to use technology and pedagogy simultaneously in the classroom. The quality of teacher contributes largely and is a chief factor in predicting the student learning (Ololube, 2005). Hence it is very essential to produce such teachers that are highly qualified and trained for performing teaching. For the past many years, there is an increase demand for qualified teachers that have necessary skills and knowledge to carry out teaching/instruction. Moreover, the knowledge and application of ICT skills in teaching is the need of the hour.

Technology has qualitatively as well as quantitatively revolutionized the way of imparting teaching and gaining learning in teaching-learning process. Technology enables the teachers, teacher-trainees and teacher educators to communicate teaching and instruction effectively. An appropriate application of techno-pedagogical skills can make this teaching-learning process a pleasurable activity (Leema & Saleem, 2017). Therefore, it is very essential for the teacher to be trained in the usage of the technology and also in the application of significant educational software in teaching-learning. Technology in the present era becomes a lifeline for the teacher as he/she should have proper knowledge and skills for its usage in educational pedagogy and practices. In this regard, the effective integration of technology is largely supported by the knowledge and skills of pedagogical practices (Hew & Brush, 2007).

Conceptual Framework Teacher education

Teacher education is mainly concerned with the development of teaching skills and proficiency in teachers so that it will prepare the teacher to meet the requirements of teaching profession and overcome various challenges that come to the teacher in discharging the instruction. These teaching skills include effective management skills, preparation and usage of instructional

content, appropriate and effective communication skills. Accordingly, techno-pedagogical skills are very essential for teaching as well as learning. These skills bring changes and advancement in the interaction pattern of teachers.

Technology: includes various modern machines, instruments and technologies such as Internet, Computer, Digital technology, Audio-Video Aids and appliances, OHP's , writing Boards, Books, e-books, etc.

Pedagogy: encompasses different processes, practices, procedures, methods, strategies and techniques used for smooth teaching and learning. It is mainly implemented in instruction, learning, teaching and assessment processes.

Technology and pedagogical knowledge

Technology knowledge includes the various ways and processes of using and working with technological tools and resources. It broadly includes the understanding of how technology can best be utilized and applied productively in day-to-day processes of life?

Pedagogical knowledge aims to provide the teachers a deep knowledge about the process, practices and strategies of teaching and learning. In general it includes the understanding of how teaching learning takes place in better and best possible way, how teachers teach and student learns, teacher manages classroom activities, plans lesson, instruction and assesses student learning?

Therefore, techno-pedagogy refers to inclusion of technological practices in the transaction of teaching in classroom by applying various methods of teaching with the help of technology. Hence, techno-pedagogical knowledge includes the understanding of certain ways where a simple content is delivered in a number of ways by using different combination of technologies and pedagogies (Thakur, 2015). In nutshell, it will provide an immense and meaningful knowledge of how best the learning takes place when a suitable technology is combined

in a particular way in transacting instruction. Techno-pedagogies provide the teacher a clear vision of the range of tools in technology and affordances provided in the pedagogy, in various forms within teaching learning process. The present paper is an initiative to understand how much techno-pedagogical practices are initiated and nurtured among the future teachers.

Operational Definitions of Key terms

Techno-pedagogical skills: In the present paper, Techno-pedagogical skills refer to such skill of the teacher that provides for blending technology and pedagogy in the transaction of successful classroom instruction.

Teacher trainees: A teacher trainee, in this study refers to the students who are studying in different streams of government and private B.Ed colleges of Visakhapatnam.

Review of related literature

Many studies have been conducted in India and abroad in order to find the Techno-pedagogical skills of various stakeholders, especially the teachers and students. Some of the findings directly related to the present studies are discussed in the following paragraph. Beri & Sharma (2019) in their study concluded that the Techno-Pedagogical competency of Private Colleges' teacher-educators is high in comparison to the teacher educators from Govt. /Govt. Aided colleges. They also found that the teacher-educators from science background have significant difference in Techno-Pedagogical Competencies than Arts background. Bhuyan & Tripathy (2020) revealed that the B.Ed Science students are slightly higher than the Arts B.Ed students in their Techno-Pedagogical skills.

Bala, P. (2018) revealed that the senior secondary school teachers of district Visakhapatnam have high techno-pedagogical competence and low level of anxiety towards the use of Instructional aids in teaching. Therefore, they are capable in using Techno-pedagogical skills in teaching. Kumar, P. (2018) conducted a study of Techno-

Pedagogical skills of secondary school teachers and found that secondary school female teachers of Andhra Pradesh somewhere lag behind in using IT devices, web facilities and inquiry based learning by using technology. However, there is no significance difference between government and aided secondary school teachers in using techno-pedagogical skills. Gloria, R. (2014) revealed that teaching with the help of technical facilities enhances and improves student's knowledge as well as facilitates teaching learning process and techno-pedagogical competencies. Sezer, B. (2015) found that the prospective teachers have insufficient knowledge and skills to use and integrate technology in the classroom. Hence, they fail to adopt technology and pedagogy simultaneously in efficient and effective way.

The above findings indicates that many researches are carried out on teaching competence, use of technology in teaching as well as on techno-pedagogical studies of school and college going students. But no researchers have carried out any research on the techno-pedagogical skills and pedagogical practices in pandemic situation of arts and science stream teacher trainees.

Objectives of the study:

On the basis of the following objectives the researcher conducted the study.

1. To study the techno-pedagogical skills of the teacher trainees belonging to Arts and Science stream.
2. To understand the usage of technology in pedagogical practices during Pandemic situation.
3. To suggest some recommendations based on the study.

Hypothesis of the study

There is no significant different between the techno-pedagogical skills of teacher trainees belonging to Arts and Science streams.

Method:

In this study the researcher used the descriptive survey method.

Population:

The population in the present study comprises of B.Ed Government and Private teacher trainees belonging to arts and science streams.

Sample:

Techno-pedagogical tool was randomly administered to population. Out of total 3325 teacher trainees in 56 B.Ed colleges of Jammu province, 100 teacher trainees, (50 arts and 50 science stream trainees) selected for the study. Similarly, out of 50 arts and 50 sciences teacher trainees 25 were taken from Government College and 25 from private B.Ed

College.

Tools:

Techno-pedagogical tool was used for data collection. The researcher also used Interview Schedule to gather information from respondents.

Statistical technique:

The researcher used Qualitative as well as Quantitative techniques for finding results wherein the percentage, mean, S.D and t-test were used to analyse the data in the present study.

Analysis:

Table I: Comparing the test scores of Science stream teacher trainees in private and government B.Ed colleges.

S. no.	Group	N	Mean	S.D	Df	t-value	Significancelevel
1	Private	25	174.6	4.66	48	2.433	Significant at 0.05 level
2	Government	25	163.8	3.42			

Interpretation:

Table I displays the analysis of the data regarding comparison of techno-pedagogical scores of Science stream teacher trainees in private and government B.Ed colleges. The mean score for science stream teacher trainees belonging to Private College is 174.6 with S.D 4.66 and mean score for science stream teacher trainees belonging to Government College is 163.8 with S.D 3.42. The 't' value is 2.433 for Df 48 is less than 0.05

level of significance i.e. 2.58. It means the value differ significantly. Thus, science stream teacher trainees of private and government B.Ed Colleges differ significantly on their Techno-pedagogical skills. It is also clear from the table that private B.Ed college teacher trainees belonging to science stream Private B.Ed colleges are better in using techno-pedagogical skills than the government college science stream teacher trainees of Jammu province.

8135

Table II: Comparing the test scores of Arts stream teacher trainees in private and government B.Ed colleges.

S. no.	Group	N	Mean	S.D	Df	t-value	Significancelevel
1	Private	25	146.7	5.48	48	5.109	Significant at 0.05 level
2	Government	25	136.8	1.04			

Interpretation:

Table II displays the analysis of the data regarding comparison of techno-pedagogical scores of Arts stream teacher trainees in

private and government B.Ed colleges. The mean score for science stream teacher trainees belonging to Private College is 174.6 with S.D 4.66 and mean score for science



stream teacher trainees belonging to Government College is 163.8 with S.D 3.42. In order to be significant 't' value should be either equal to 2.58 or above it, for df 48. Hence, the Hypothesis stands rejected, as the calculated' value 5.109 is greater than the above table value. It means Arts stream teacher trainees belonging to Private and Government B.Ed colleges differ significantly on their techno-pedagogical scores. It is evident from the table that teacher trainees

belonging to Private B.Ed colleges are good in using techno-pedagogical skills and technology than the teacher trainees of Government colleges of Jammu province. Similar results have been found by Beri & Sharma (2019) in their study that the Techno-Pedagogical competency of Private Colleges' teacher-educators of Punjab region is high in comparison to the teacher educators from Govt. /Govt. Aided colleges.

Table III: Comparing the test scores of Science stream and Arts stream teacher trainees in B.Ed colleges.

S. no.	Group	N	Mean	S.D	Df	t-value	Significance level
1	Science Students	50	169.26	24.6	98	4.06	Significant at 0.05 level
2	Arts Students	50	141.76	20.82			

8136

Interpretation:

Table III displays the data related to techno-pedagogical skills of Science stream and Arts stream teacher trainees in B.Ed colleges in terms of t-value. The obtained t-value is 4.06, which was significant at 0.05 level of confidence. It means Science and Arts stream teacher trainees in B.Ed colleges differ significantly on techno-pedagogical skills from each other. Hence, the hypothesis stands rejected. However, table shows greater means for science students as compare to Arts students. The results of this study is also supported by the other studies as Beri & Sharma (2019) also concluded that the teacher-educators of Punjab region from science background have significantly difference in Techno-Pedagogical

Competencies than the teacher-educators from Arts background. Likewise, Bhuyan & Tripathy (2020) revealed that the bachelors of education Science students of Odisha are slightly higher than the Arts B.Ed students in their Techno- Pedagogical skills.

After analysis the data, mean values shows the presence of greater means in favour of Science and Arts stream teacher trainees of private B.Ed colleges of Jammu province. It may be due to the reason that Private B.Ed colleges have good quality and ample quantity Technological aids, Equipments and Infrastructure. Kumar (2018) found in the study that the government institutions suffer from the lack of necessary instructional Aids and technological devices/infrastructure.

Table IV: Analysis and interpretations of Teacher trainees Interview Responses.

S. no.	Technology in pedagogical practices during pandemic situation (COVID 19).	Percentage of responses
		Yes %age
1.	Internet	99%
2.	Mobile	97%
3.	Laptop, Notebook, etc.	69%
4.	Zoom app, Google meet, etc.	89%



5.	Go to Webinar, Go to Meeting, etc.	57%
6.	Social networking sites (Watsapp, Facebook, etc.)	91%
7.	E-Mail/ G-Mail	84%
8.	Reading and Writing software, projectors, etc.	61%

Interpretation: The present situation demands for the Inclusion of various technologies in pedagogy. Most of the respondents agree that some of the technologies support teaching and learning by and large in a drastic situation and support education system. These technologies are of upmost importance in the successful instruction by applying techno-pedagogical skills are Internet (99%), Mobile (97%), Zoom app, Wise app and Google meet (89%), Watsapp and face book (91%), e-mail (84%), laptop, Web-cam facility, projectors, reading and writing software, etc. (61%) . Airekar (2020) revealed that in the present COVID19 Situation new streams of learning and technology are emerging in the education process. Teaching is facilitated by Zoom App, You Tube Channels, Webinar, Skype, etc.

Discussion of Results:

Major findings of the study reveal that the mean score of science stream teacher trainees are higher than the arts stream and the mean score of private colleges, both Arts and Science stream teacher trainees are higher than the mean scores of Government B.Ed colleges. There it clearly shows that the Private colleges are much better in infrastructure and facilitating better training in techno-pedagogical skills than the government colleges.

Suggestions and recommendations based on the research

1. Proper training of handling the various tools, application and solve day-to-day technical problems.
2. Design the various tasks that are essential for the application of pedagogy.
3. Develop need analysis of various software and technology essential for pedagogy delivery.
4. Design various technological interactions for successful transaction of knowledge and instruction.

5. Time table management and interaction of different learners and colleagues through technical media.
6. Prospective teachers need to be adequately trained in using latest technologies in the contemporary methods of teaching. Sezer (2015) examined that the graduate teachers from education faculties with insufficient knowledge and inadequate skills fail to integrate technology and Pedagogy.

Conclusion:

On the basis of analysis, it has been concluded that the teacher trainees belonging to science stream have better techno-pedagogical skills than the teacher trainees of arts background. Moreover, the techno-pedagogical skills are found to be better imparted through the private B.Ed colleges as compared to government B.Ed colleges. Therefore, there is an urgent need to provide proper technological facilities, Infrastructure improvement and its maintenance should be made in government colleges.

References

1. Airekar, J. A. (2020). A Study of the Effects of Lockdown on students’ school life during the Global Outbreak of the Corona Virus. *Journal of Education & Pedagogy*, 12(1), 23- 29.
2. Bala, P., & Tao, I. (2018).An Examination of Techno-Pedagogical Competence and Anxiety towards the use of Instructional Aids in teaching among senior secondary school teachers. *Chetana*, 3(3), 95-114.
3. Beri, N., & Sharma, L. (2019). A Study on Techno Pedagogical and Content Knowledge among teacher-educators in Punjab Region. *International Journal of Engineering and Advanced Technology*, 8(5), 1308-1310.
4. Bhuyan, S., & Tripathy, M. K. (2020). Techno-Pedagogical Skills of Bachelor of Education Students of Odisha. *Scholarly*



- Research Journal for Interdisciplinary Studies*, 8(62), 14556-14562.
5. Gloria, R., & Benjamin, E. W. (2018). Attitude of teachers towards techno-pedagogy. *International Journal of Engineering Technologies and Management Research*, 5(4), 87- 89.
 6. Hew, K. F., & Brush, T. (2007). Integrating Technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Education Technology Research and Development*, 55, 225-242.
 7. Kumar, P. (2018). A Study of techno-pedagogical skills of secondary school Hindi teachers working in Andhra Pradesh. *International Journal of Advance Research and Innovative Ideas in Education*, 4(1), 909-912.
 8. Leema, K. M., & Saleem, T. M. (2017). Infusion of Techno Pedagogy in Elementary Teacher Education Curriculum: Perspectives and Challenges. *Journal of Humanities and Social Science*, 22(1), 06-09.
 9. Ololube, N. P. (2005). Benchmarking the Motivational Competences of Academically Qualified Teachers and Professionally Qualified Teachers in Nigerian Secondary schools. *The African Symposium*, 5(3), 17-22.
 10. Sezer, B. (2015). Examining techno pedagogical knowledge competencies of teachers in terms of some variables. *Elsevier*, 174, 208-215.
 11. Thakur, N. (2015). A Study on implementation of techno pedagogical skills, its challenges and role to release at higher level of education. *American International Journal of Research in Humanities, Arts and Social Sciences*, 9(12), 182-186.