Journal of Positive School Psychology http://journalppw.com
2022, Vol. 6, No. 3, 10347-10356

A Study On Technological Pedagogical Content Knowledge Aptitude (TPACK) AndTeaching Style Of B.Ed. Teacher Trainees

Mrs. B BHUVANA[1] , Dr. G ARUMUGAM[2]

[1]*Research Scholar Department of Education Annamalai University Annamalai Nagar.*
[2]*Associate Professor Department of EducationAnnamalai University Annamalai Nagar.*

Abstract

The present century has seen a fastest rise in the use of technology in all aspects of lifeincluding the field of education. The quality of education greatly depends on quality of teaching. To enhance the quality, some teachers use teaching aids like charts, models, specimen, slides, etc. Teaching to the students of 21st century (alpha generation) requires global skills. Technically upgraded ICT driven knowledge, the 21st-century has presented world an unprecedented reality that was a distant dream in the past. The rapid advancements and use of ICT devices (smart phones, laptops, shared white boards, play stations etc.) have been forcing teachers to integrate technology in teaching. The research investigator uses survey method for collecting the data. The investigator prepared and validated a scale to measure teaching style. Self-Constructed TPACK Aptitude test. The sample drawn from the population of students belongs to B.Ed., colleges in Chennai Tamil Nadu. The total number of sample was 100 B.Ed trainees, 22 B.Ed trainees were Male and 78 B.Ed trainees were female. For analyze the data statistically , the investigator used Mean, Standard Deviation, 't' test. The findings showed that the TPACK of Aptitude and TPACK of Teaching style has no significant difference in gender, Aware of using Technologies and Type of management. Hence, it is critical to measure pre-service teachers' self-efficacy beliefs and Level of aspiration towards TPACK in order to identify the factors that contribute to a teacher's use oftechnology in classroom instruction. The intervention module was effective in improving technological proficiency of male and female pre-service teachers. Therefore, the interventionmodule helped the students to use computers on almost all their academic and personal purposes.

I. INTRODUCTION

Teaching is a wonderful profession that necessitates the integration of many different types of specialized knowledge, as educators are well aware. Teaching is an example of a structured discipline in this sense, as it requires teachers to apply complicated knowledge structures in a variety of circumstances and contexts. Technologies using in the classrooms digitally offers a wealth of new opportunities for teaching and learning by collaborating technology such as interactive whiteboards, audio-visual aids, ICT labs, educational based games, classroom activities, educational software, review software, cloud-based e-learning initiatives, and so on. In addition to the above mentioned, it has been shown to increase learning retention, customize the education learning process, increase opportunities for experiment basedstudy, decrease rote memorization, and promote active learning methodology even more.

It seems a great challenge for the present teachers to compete with the new technologies based on computers to complete teaching process. At the heart of good teaching with technology are three classified into core components: content, pedagogy, and technology, plus the relationships among and between them. The quality of teaching will really based on how the teachers handle the technological package in the field of education to bring the expected learning outcomes. These three knowledge bases (content, pedagogy, and technology) form the core of the technology, pedagogy, and

content knowledge (TPACK) plays a significant role in boosting teaching style for the better achievement.

Technological Pedagogical Content Knowledge (TPACK) is an emergent form of knowledge that goes beyond all three core components (content, pedagogy, and technology); it is an important technology to develop teaching learning process to bring out the success in learning outcomes.

2. Need And Significance Of The Study

The integration of technology into teaching-learning before the year 2019 is on one hand and the technology being used after 2019 during this covid- 19 pandemic situation is at other hand. As the requirement of using technology in education is increasing rapidly the teacher education programs along with the institutions shall also comply with the need. For that matter it is important to determine how well pre-service teachers can integrate technology in classrooms. Through this study, all the stakeholders of teacher education will understand pre-service teachers' preparedness to integrate technology into their future classrooms before they enter into real time teaching profession. The quality of how technology is addressed in teacher education programmes is one of the conditions for how student teachers apply technology in schools after their graduation. In teacher education programmes, technology receives little attention, mostly pedagogy and psychological based theme to understands student will dominate the study. It seems that only a small number of beginning teachers are able to use technology in diverse and flexible ways to create student- centred learning. This lack of attention to technology in teacher education leads to produce low competent teachers with technological background and it creates more distance between teacher and students.

Transforming teacher education with preparing tomorrow's teachers to teach with technology is a soul responsibility of Teacher Educators. The TPACK framework (Technological, Pedagogical And Content Knowledge), which has hugely developed after its introduction by Mishra and Koehler in 2006 Mishra, P., & Koehler, M. (2006), provides an umderstanding for creating competent teachers to cope with the technological era.

3. Operational Definition Of The Key Terms UsedTechnological, Pedagogical & Content Knowledge

It is the understanding of content (subject matter), what may be beneficial to learning (pedagogy), and the use of technology (ICT). Pedagogical, Content Knowledge & technological are the terms used to define the combination (TPACK). It entails more than merely incorporating ICT into existing methods. It requires a thorough understanding of how ICT may be utilized to process & access subject matter (TCK) as well as how to enhance & support the ICT learning (TPK) when used with the combination of PCK (Schmidt et al, 2009).

TPACK Aptitude

TPACK (Koehler & Mishra, 2009; Mishra & Koehler, 2006) addresses what instructors need to know in order to incorporate technology; it focuses on three primary components of teacher knowledge: pedagogy, content knowledge & technology.

A group of symptoms or indicators of one's capacity to aquire skill & certain knowledge in a particular sector is defined as an aptitude. They are hidden potentials that emerge as a result of changes in the environment. They are undeveloped qualities and capabilities in specific areas. Aptitude is a specific, definite, unitary trait linked to professional achievement.

Teaching style

The effort made by teachers to integrate

their values & beliefs about teaching with their behavior during the learning process of teaching is referred to as teaching style (Heimlich and Norland, 2002). The teaching style, according to Grasha (2002), is the behavior that is exhibited by teachers consistently and repeatedly while having interaction during the teaching learning process with students.

B.Ed., Trainees

Trainees of B.Ed. student instructors who have not yet started teaching.

4. Review Of Literature

Review of previous literature or studies is a systematic process that requires careful and perceptive reading and attention in detail. In this, the researcher attempts to determine what others have learnt about similar research problems and to gather information relevant to the research problem at hand. For any research study in the field of knowledge, the researcher needs an adequate familiarity with the work, which has already been done in the area of their choice. One of the early activities in the research process is research literature; the body of research information relates to the problem. After the problem has been identified information is needed about the problem so that it can be put in the proper context and then only the research can be preceded effectively.

The purpose of the literature review was to obtain information from a wide range of source, therefore this chapter attempts to review the literature that the researcher believes are relevant to the study. In this study, the researcher looked at pre-service teacher educators' teaching strategies in terms of Aptitude and Teaching Style of the B.Ed Trainees Technological Pedagogical and Content Knowledge (TPACK).

Paidi; Subali, Bambang; Handoyo, Luisa Diana (2021) conducted a study The Mastery of Technological, Pedagogical, and Content Knowledge among Indonesian Biology Teachers. The mastery of Technological Pedagogical Content Knowledge (TPACK) is very important for teachers in order to achieve qualified learning. Analyzing the mastery of TPACK by teachers in Indonesia seems to be imperative to provide baseline data to

Indonesian government. This study aimed to examine the mastery of TPACK, in particular among biology teachers in terms of their teacher certification status, educational level, and academic background. This research involved 68 biology teachers obtained through proportional random sampling in five districts of Yogyakarta Special Region, Indonesia. The data collection was conducted through a multiple-choice test consisting of 33 items. The results showed that although the teacher's mastery of TPACK was categorized as fair (60.13),it does not meet the work performance standards as a good teacher in Indonesia which has a minimum score of 76.00. Using Mann Whitney U and Kruskal Wallis Tests ($p < 0.05$), the evidence revealed that the mastery of TPACK among biology teachers is likely influenced by the academic background, educational level, and teacher certification status.

Nogerbek, Assem; Sumatokhin, Sergey; Maimatayeva, Assiya; Ziyayeva, Gulnar; Childibayev, Dzhumadil (2022) conducted a study on Future Biology Teachers' Opinions on Technological Pedagogical Content Knowledge. The purpose of this research is to evaluate the technological pedagogical content knowledge of future biology teachers. In this study, the qualitative research method was used

while making associations about the findings. Twenty (20) students studying in the biology teaching department of various universities in Kazakhstan constitute the study group of the research. The data of the researchwere collected by semi-structured interview technique. Considering the purpose of the research, a semi-structured interview form developed by the researcher was prepared. As a result of the research, it was determined that the majority of the pre-service teachers found themselves somewhat inadequate regarding their teaching skills by suitably combining technology and teaching approaches. The vast majority of pre-service teachers find themselves inadequate regarding their ability to use information and communication technologies as a tool for students to share their thoughts and ideas.

5. Objectives

1. To find out significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of aptitude based on their Gender.
2. To find out significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based on their Gender.
3. To find out significant difference among the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on Type of Management.
4. To find out significant difference among the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based on Type of Management.
5. To find out significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on Aware of using Technologies of B.Ed trainees.
6. To find out significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based on Aware of using Technologies of B.Ed trainees.

6. HYPOTHESIS

1. There is no significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on their Gender.
2. There is no significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based ontheir Gender.
3. There is no significant difference among the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on Type of Management.
4. There is no significant difference among the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based onType of Management.
5. There is no significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on Aware of using Technologies of B.Ed trainees.
6. There is no significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based on Aware of using Technologies of B.Ed trainees.

1. METHOD AND PROCEDURE

The investigator adopted survey method for the present study. The investigator prepared and validated a scale to measure TPACK of Aptitude and Teaching Style of B.Ed trainees. All the B.Ed students studying in college of education in Chennai District formed the population of the study. From the population, the

investigator has chosen 100 B.Ed trainee students using simple random sampling technique. For analyzing the data, the investigator used Mean, SD, 't' Test and F-Test.

1. HYPOTHESIS TESTINGNULL

HYPOTHESIS – I

There is no significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on their Gender.

TABLE -4.01

Table shows the significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on theirGender using mean scores.

VARIABLE	GENDER	N	MEAN	SD	t - value	L.S
(TPACK) of Aptitude	MALE	22	136.23	29.608	1.259	NS
	FEMALE	78	144.49	26.465		

INFERENCE

From the above table, it is inferred that t-value (1.259) is lesser than the table value (1.96) at 0.05 level. The female mean score is 144.49 is better than Male mean score 136.23. Hence there is no significance difference between the Male and Female B.Ed trainees Technological Pedagogical Content Knowledge (TPACK) of Aptitude mean scores. Therefore the above null hypothesis is accepted.

NULL HYPOTHESIS – 2

There is no significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based on their Gender.

TABLE -4.01

Table shows the significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based ontheir Gender using mean scores.

VARIABLE	GENDER	N	MEAN	SD	t - value	L.S
(TPACK) of Teachin	MALE	22	38.91	8.366	0.217	NS

g Style	FEMALE	78	39.29	7.073		

INFERENCE

From the above table, it is inferred that t-value (0.217) is lesser than the table value (1.96) at 0.05 level. The female mean score is 39.29 is better than Male mean score 38.91. Hence there is no significance difference between the Male and Female B.Ed trainees Technological Pedagogical Content Knowledge (TPACK) of Teaching Style mean scores. Therefore the above null hypothesis is accepted.

NULL HYPOTHESIS – 3

There is no significant difference among the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on Type of Management.

TABLE -4.03

Table shows the significant difference among the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on Type ofManagement using mean scores.

VARIABLE		SUM OF SQUARES	DF	MEAN SQUARES	F value	L.S
(TPACK) of Aptitude	**Between groups**	974.641	2	487.321	0.652	NS
	With in groups	72535.469	97	747.788		
	Total	73510.110	99			

INFERENCE

From the above table, it is observed that the F-ratio (0.652) is lesser than the table value (2.60) at 0.05 level and hence the difference is no significant. Hence the null hypothesis is rejected.

NULL HYPOTHESIS – 4

There is no significant difference among the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based on Typeof Management.

TABLE -4.03

Table shows the significant difference among the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based onType of Management using mean scores.

VARIABLE		SUM OF SQUARES	DF	MEAN SQUARES	F value	L.S
(TPACK) of Teaching Style	**Between groups**	13.409	2	6.705	0.122	NS
	With in groups	5311.181	97	54.754		
	Total	5324.590	99			

INFERENCE

From the above table, it is observed that the F-ratio (0.122) is lesser than the table value (2.60) at 0.05 level and hence the difference is no significant. Hence the null hypothesis is rejected

NULL HYPOTHESIS – 5

There is no significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on Aware of using Technologies of B.Ed trainees.

TABLE -4.05

Table shows the significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on Awareof using Technologies of B.Ed trainees using mean scores.

VARIABLE	AWARE OF USING TECHNOLOGIES	N	MEAN	SD	t - value	L.S
(TPACK) of	Yes	83	143	27.342	0.912	NS

Aptitude			.80			
	No	17	137.18	26.915		

INFERENCE

From the above table, it is inferred that t-value (0.912) is lesser than the table value (1.96) at 0.05 level. Using Technologies Aware of B.Ed trainees mean score is 143.80 is better than Below not using Technologies Aware of B.Ed trainees mean score 137.18. Hence there is a significance difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on Aware of using Technologies of B.Ed trainees mean scores. Therefore the above null hypothesis is accepted.

NULL HYPOTHESIS – 6

There is no significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based on Aware of using Technologies of B.Ed trainees.

TABLE -4.05

Table shows the significant difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Teaching Style based onAware of using Technologies

VARIABLE	**AWARE OF USING TECHNOLOGIES**	**N**	**MEAN**	**SD**	**t - value**	**L.S**
(TPACK) of Teaching Style	Yes	83	143.80	27.342	0.912	NS
	No	17	137.18	26.915		

of B.Ed trainees using mean scores.

INFERENCE

From the above table, it is inferred that t- value (0.912) is lesser than the table value (1.96) at 0.05 level. Using Technologies Aware of B.Ed trainees mean score is 143.80 is better than Below not using Technologies Aware of B.Ed trainees mean score 137.18. Hence there is a significance difference between the B.Ed trainees with respect to Technological Pedagogical Content Knowledge (TPACK) of Aptitude based on Aware of using Technologies of B.Ed trainees mean scores. Therefore the above null hypothesis is accepted.

8. Educational Implications

The TPACK aptitude helps to improve development of better techniques for identifying and explaining how technology related professional knowledge is implemented and represented in practice at the school level. Teachers may graded on the basis of knowledge they acquired in both subject and usage of technological package. In addition, the TPACK aptitude has offered several possibilities for promoting research in teacher education, teacher professional development, and teachers' use of technology. It has offered options for looking at a complex task into a simple task using TPACK aptitude. The implementation of Intervention program (TPACK Application Suite) almost doubled the Technological Pedagogical and Content knowledge of teacher trainees, study result has proved that skills required to handle virtual classes cannot be seen in teachers over night but the rigorous training is required to instil. Moreover, it has allowed teachers, researchers, and teacher educators to move beyond oversimplified approaches that treat technology as an add on to focus instead, and in a more ecological way, upon the connections among technology, content, and pedagogy as they play out in classroom contexts. This is ongoing, and we anticipate much more work in this area in the future.

9. CONCLUSION

Pre-service teachers' knowledge of technological pedagogical and content knowledge was investigated in this study. An experiment was done to determine the influence of the intervention module (TPACK Application Suite) on pre-service teachers' technical proficiency. To enhance effective knowledge in pupils, it became vital to use technology into the classroom. Educational technology is a notion that has been around for a long time, but it has never been given the attention it deserves. On other hand, the pandemic due to COVID- 19 outbreak urged the teachers and all academicians to upgrade with recent technological advancements to integrate them into teaching learning. The conventional teaching paradigms got a kick with embedded teaching learning approaches and these changes looking for teachers who can handle the academics on digital platform

rightly started from preparation of e-content, choosing a virtual platform, employing an online assessment tool and choosing digital platform to communicate with students and parents. Teacher of 21st centaury should upgrade to meet globalization of education by realizing the aspirations of young students. The

technology is now demanding almost all the spheres in the world including education. The stakeholders of education should cope with all certain requirements of these digital classrooms

References

- Ammade, Salasiah; Mahmud, Murni; Jabu, Baso; Tahmir, Suradi (2020) TPACK Model Based Instruction in Teaching Writing: An Analysis on TPACK Literacy. International Journal of Language Education, v4 n1 p129-140 Mar 2020.
- Arya, Poonam; Christ, Tanya; Wu, Wen (2020) Patterns of Technological Pedagogical and Content Knowledge in Preservice-Teachers' Literacy Lesson Planning. Journal of Education and Learning, v9 n5 p1-14 2020.
- Cetin-Dindar, Ayla; Boz, Yezdan; Sonmez, Demet Yildiran; Celep, Nilgun Demirci (2018) Development of Pre-Service Chemistry Teachers' Technological Pedagogical Content Knowledge. Chemistry Education Research and Practice, v19 n1 p167-183 Jan 2018.
- Choi, Youngmi; Hong, Seung-Ho (2022) Effect of a Science-Based TPACK Program for Elementary Preservice Teachers According to Their Gender. Contemporary Issues in Technology and Teacher Education (CITE Journal), v22 n3 2022.
- Choi, Youngmi; Hong, Seung-Ho (2022) Effect of a Science-Based TPACK Program for Elementary Preservice Teachers According to Their Gender. Contemporary Issues in Technology and Teacher Education (CITE Journal), v22 n3 2022.
- Dalal, Medha; Archambault, Leanna; Shelton, Catharyn (2021) Fostering the Growth of TPACK among International Teachers of Developing Nations through a Cultural Exchange Program. Australasian Journal of Educational Technology, v37 n1 p43-56 2021.