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Pre-Service Teacher's Perceptions on Technological Pedagogical and Content Knowledge (TPACK)

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Abstract

This is 21st century, an era of aligns standardized curriculum, advanced technologies and integrated knowledge. To meet the challenges of this changing world there is a need to enhance the certain core competencies of teachers such as collaboration, digital literacy, critical thinking, problems solving and the knowledge of teaching and technology to achieve the goals of quality of education and students' achievement. Technological Pedagogical and Content Knowledge (TPACK) is a technical framework of collective and composite knowledge required for teachers teaching practices in the classrooms with technology integration. So, in this study the perceptions of pre-service teacher's about TPACK were assessed through cross sectional survey. Sixty-five secondary school pre-service teachers from Department of Education, Mizoram University were selected as sample of the study. A five-point Likert scale was used in this study to collect the information from the respondents. The research reveals that majority of pre service teachers has average level of professional knowledge of technology integration and its use in their teaching practices and there was no significant difference in their perceptions of TPACK with reference to their gender.

Keywords: TPACK, Pre-Service Teachers, Perceptions, technology integration.

Introduction:

The teacher is the most pivotal person during the implementation of all education reforms at the base line in education. A teacher plays a crucial role in the upbringing and intellectual nourishment of students. A qualified and skilful teacher is the one who can build the nation and determines the values, gives priority to learning first over teaching. The academic qualifications, knowledge of content, good competence level, pedagogical knowhow and teachers' willingness played an important role in the teaching-learning process. (Sharma, Leena, 2017). The able teacher can bring a great change in society through his believes in the broader perspective of education, which completely transforms an individual. Teachers should be well equipped with the knowledge of their subject, its delivering methods and skill for its management.

To get the best teaching excellence and commitment to professional it is necessary to get a preparation before entering to teaching service. During such activities where a teacher is required to instruct their students, technology use play an important role so that students must remain engaged in learning process (Kuzu & Gunuc, 2014). Having involvement of technologies provides readily available information, the teacher is bond to provide it being the facilitator, advisor or as a mentor. The role of a teacher is to develop

an environment in which he can guide them in the right direction and students learn a lot through it (Hardisky, Michael (2018). Therefore, researchers have agreed that teachers must be compatible to combined technology with their pedagogical skills and content knowledge accordingly (Mishra & Koehler, 2006; Otrel-Cass et al., 2010).

Significance of the study:

Teachers in the 21st century must not only be familiar with the operation of instructional technologies but also with their application within the curriculum and their classroom. As the successful use of technology continues to gain attention and becomes more ubiquitous in our society novice and veteran teachers may possess the pedagogy but lack a technological base from which to adapt the device (B.W. Melissa. (2013). This research focuses on knowledge of teaching and technology and teaching practices with the use of technologies as contexts for the awareness of technology integration in teaching learning process for pre-service teachers. So, in this study the perceptions of pre-service teacher's about TPACK were assessed through cross sectional survey. The purpose of the study is also sought to explore the perceptions of pre service teachers' technological pedagogical content knowledge (TPACK) and the competency level of teachers' professional knowledge of technology integration. This research focused on the professional knowledge of pre services teachers and their teaching practices with the use of technologies as contexts for the awareness of technology integration in teaching learning process

Objective of the study:

1. To find out the competency level of pre-service teachers' professional knowledge of technology integration and its use in their teaching practices.
2. To compare the pre-service teacher's perceptions of technological pedagogical content knowledge (TPACK) with reference to their gender.

Hypotheses of the Study

There is a significant relationship in pre-service teacher's perceptions on their knowledge of technology, pedagogy and content with reference to their gender.

Methodology:

For this study, descriptive survey method was used. Out of 100 pre-service secondary school teachers in the Department of Education, Mizoram University, 65 were selected as sample for the present study. An overall knowledge was assessed based on Likert Scale regarding content of each subject with technology and teaching approaches. Data for the present study were collected from the sample pre-service teachers who were undergoing B.Ed. programme at Department of Education, Mizoram University. The investigator personally visited the institution and administered a self-made Likert scale to the sample pre-service teacher trainee.

Analysis and Interpretation:

The data collected through the questionnaire were analysed and interpreted by finding out the percentage of the respondent's reaction for each question. In order to classify the pre-service teachers into different levels, those who scored one standard deviation below the mean were categorizes as having moderate level of competency. Those who scored one standard deviation above the mean were categorized as having

above average level of competency. Those who scored between minus one standard deviation and plus one standard deviation were categorized as having average level of competency. Comparison of pre-service teacher's perception with respect to their gender is also done by finding out their differences using the t test. Analysis and interpretation are done in accordance with the objectives of the present study as follows:

Objective no.1*:* To find out the competency level of pre-service teachers' professional knowledge of technology integration and its use in their teaching practices.

Table 1

Competency level of pre-service teachers' professional knowledge of technology integration and its use in their teaching practices.

Level of Competency	Respondents	Percentages
Moderate	9	13.84%
Average	50	76.92%
Above Average	6	9.23%
Total	65	100%

The above table reveals that majority (76.92%) of all the respondents had average level of competency professional knowledge of technology integration and its uses in their teaching practices while few of the respondents (13.84%) had moderate level and negligible percentages (9.23%) had above average competency level.

Objective no.2*: To compare the pre-service teacher's perceptions of technological pedagogical content knowledge (TPACK) with reference to their gender.*

In order to compare the perceptions of technological pedagogical content knowledge (TPACK) of male and female pre-service teachers, the mean and standard deviation of the scores of male and female were calculated. The mean difference of these two groups were testes by applying 't' test and the details are presented in the following table no2.

Table 2

Comparison of pre-service teacher's perception of TPACK with respect to their gender

Groups	Number	Mean	SD	MD	SEMD	t-Value	Sig. level
Male	23	114.17	8.45				
Female	42	112.10	11.00	2.07	2.44	0.07	NS

Table 2 reveals that the calculated 't' value of .07 is lower than the criterion 't' value at both .01 and .05 level. Therefore, it can be concluded that there is no significant difference between the male and female pre-service teacher's perception on their knowledge of TPACK. Hence, the hypothesis that there is a significant relationship in pre-service teacher's perceptions on their knowledge of technology, pedagogy and content with reference to their gender cannot be accepted.

Discussion:

From the study it can be concluded that majority of the pre-service teachers have average level of competency professional knowledge of technology integration and its uses in their teaching practices, which means that they are sufficiently aware of technology integration in teaching learning process. It was also found that the percentages of both male and female respondents had almost similar conceptual level

of knowledge of technological, pedagogical and content and there is no significant relationship. Hence, the research hypothesis which states 'There is a significant relationship in pre-service teacher's perceptions on their knowledge of technology, pedagogy and content with reference to their gender' is rejected. However, average does not necessarily indicate good or desirable of core competencies of teachers such as collaboration, digital literacy, critical thinking, problems solving and the knowledge of teaching and technology to achieve the goals of quality of education and students' achievement.

It was also found that some of the pre-service teacher's perceptions regarding their technology knowledge and abilities were low. It also revealed that teachers do not feel that they know about many different technologies and how to use them. Respondents in this study were not confident in their knowledgeable of different types of technology, especially for educational purposes. Teachers' implementation of technology integration into their practice is often dictated by their feelings of confidence with using technology in every-day instruction. Teachers' technology knowledge can be defined as teachers' knowledge of technology that is accessible for classroom use, such as technological tools, applications (apps), websites and devices. Many respondents were familiar with technology for personal use but were less likely to know how to incorporate the technology into classroom instruction.

Recommendations and suggestions

Based on the findings, the following recommendations are suggested for consideration. These recommendations could help achieve the education policy objectives that have been linked with the overall developments in the education sector. The recommendations are:

- TPACK should be included in the basics of the teacher's education programs. Curriculum should have a positive approach of teaching with technology of the subject.
- The TPACK should be processed in such way through which student learning could be improved the ultimate goal of teaching.
- For proper implication, more research is required in urban and rural as well as public and private sector to assess other contextual issues during the practical application of TPACK.
- Content, technological and pedagogical skills should teach and modelled together in an integrated manner. Pre-service teachers did not receive adequate training for technological education during the courses of their study. It is necessary that effectiveness and efficiency that resources other than human and human power are handled in a more realistic way.
- The teaching process should be developed with latest technology as an add-on and in such a way that should be taken into consideration the classroom contexts.

Conclusion

It was clear from the respondents' perspectives and the information that was discussed above, both from the findings, integration of digital technology has often been a topic of debate and its key users, the students and teachers, were ready to use it for their everyday. However, there were some points that needed policy level attention to enable easy integration, such as, there should be a curriculum level approach towards digital technology integration. Also, there should be content and technical workshops focused on updating teachers about latest mobile technology trends, new approaches in mobile learning, or learning through mobiles. Information technology infrastructure should be enhanced at school level and dedicated programs specifically designed both for students, teachers, and support staff as part of the overall integrated technology program of the school environment because, unless there was a trained technical

support staff available, there was no viable way to sustain teachers' development of their technological, pedagogical and content knowledge.

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