



Evaluation of TPACK (Techno Pedagogical And Content Knowledge) of prospective teachers during their practice teaching.

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Abstract:

The development of a teacher's proficiency and competence is the focus of a program known as teacher education. This program equips and empowers teachers to meet the demands of their profession and to take on its challenges, and the biggest challenge which is needed to be worked upon is teachers' competency in using new technologies during their classroom teaching. Technology is now widely used in every aspect of society and education. Podcasts, video case studies, online content delivery, technology-based support, supervision, and feedback, as well as virtual or simulation-based learning experiences, are the major categories of research and technological application in teacher education to date. The professional growth of teachers appears to be heavily reliant on the training of pre-service teachers in the educational use of technology. Despite the numerous efforts made by researchers and educators over the course of the year during the COVID and post-COVID periods to make teachers "tech-savvy" or knowledgeable about the educational uses of technology, teachers still lack the abilities and knowledge necessary to effectively teach using technology. The aim of the study was to evaluate the TPACK responses of the prospective teachers enrolled in the b.Ed program during their practice teaching. The population selected was prospective teachers enrolled in the b.Ed program of Prayagraj district. In this study, 50 science lessons of 50 prospective teachers from the 2 colleges of Prayagraj district were observed in relation to the knowledge of 7 various domains used by prospective teachers, such as knowledge of the subject matter, lesson planning, lesson presentation, teaching methods, learners, assessment, and technology used. A Response scale/observation protocol developed by the researcher on the 7 key domains was used. The hypothesis made was accepted. Major findings suggest that only 2.15% of the pre-service teachers are tech savvy, or they use techno-educational inputs while preparing their lesson plan or delivering the content. The rest of the 97.85% were unaware of what and how to use technology during their lessons. So, findings suggest that there is a need to consider adopting long-term approaches for pre-service teachers enrolled in the B.Ed. program. The flexibility of the system is therefore built in because it is always possible to alter, enhance, and construct new teaching-learning activities.

Keywords: Prospective Teachers, Subject Matter, Lesson Planning, Presentation, Teaching Methods, Assessment, Technology

Introduction

Teaching, according to Edmund Amidon, is "an interactive process, principally involving classroom a discussion that takes place between teacher and pupil and occurs during particular predefined activities." The teacher is the most significant component of any educational program, as stated by NCTE (1998) in Quality Concerns in Secondary Teacher Education. At any point in the educational process, the teacher is primarily in charge of its execution.

Teachers really do have an impact on the future of our children and, by extension, the future of our country. In India, the teacher is regarded as the most honorable member of society because of this highest function.

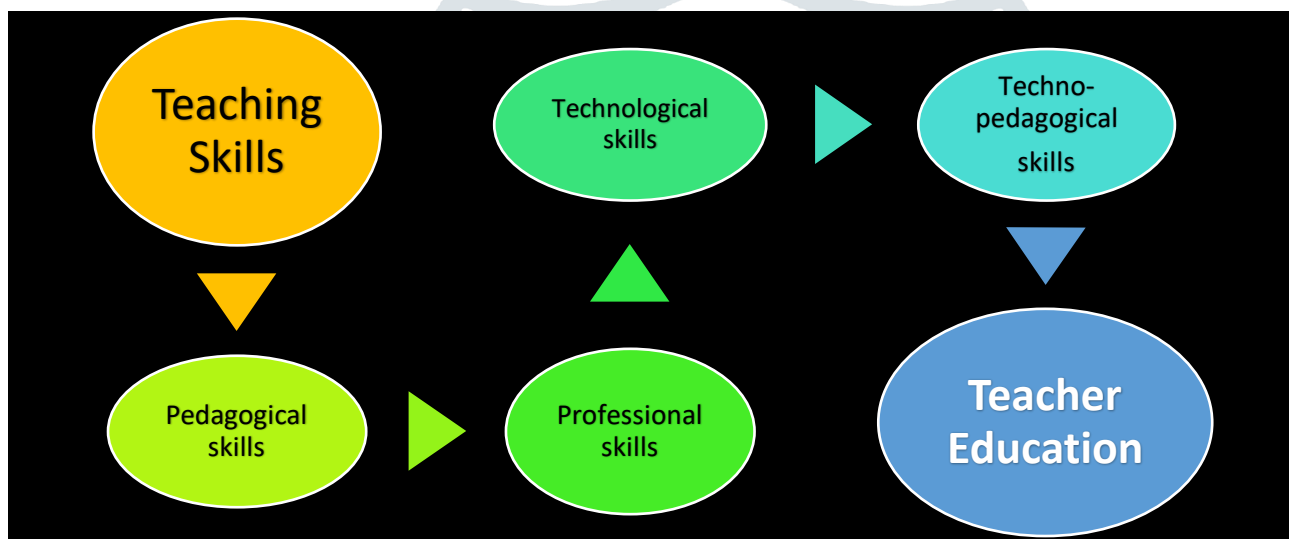
Earlier,

Teacher Education = Teaching Skills + Pedagogical theory + Professional skills.

Now,

Teacher Education comprises of:

Fig 1



As a result of technological advancement, education is currently subject to a paradigm change from the era of traditional chalk-and-talk teaching style to digitizing the pedagogical approach through technical equipment. For a more effective teaching-learning process, the idea of a traditional classroom has been modified to a digital classroom.

NEP 2020:

Teachers require suitable training and development to be effective educators. It cannot be assumed that a good teacher in a traditional classroom will automatically be a good teacher in an online classroom.

India is a global innovator in fields like space exploration and information and communication technologies. The Digital India Campaign is assisting in the transformation of the entire country into a knowledge-based society and economy. The interaction between technology and education at all levels is reciprocal, and while education will be crucial to this transition, technology will also be crucial in improving educational procedures and outcomes.

Effective teaching

University of London's Institute of Education's Dr. Jacek Wiktor Brant conducted a study titled "Subject-matter expertise and pedagogical knowledge: necessary components of effective instruction? the viewpoint of England", contending that effective teacher preparation should also focus on helping new instructors understand the limitations of their existing paradigms. Get new teachers to approach the class from the perspective of the student's learning objectives rather than the content that needs to be covered, for instance, as an illustration of this.

Statement of the problem

The investigator was interested to undertake the study entitled “Evaluation of TPACK (Techno Pedagogical and Content Knowledge) of prospective teachers during their practice teaching”.

Objective

The objective of the study was to find out the responses of prospective teachers towards techno-pedagogical and content knowledge of science lessons.

Hypothesis

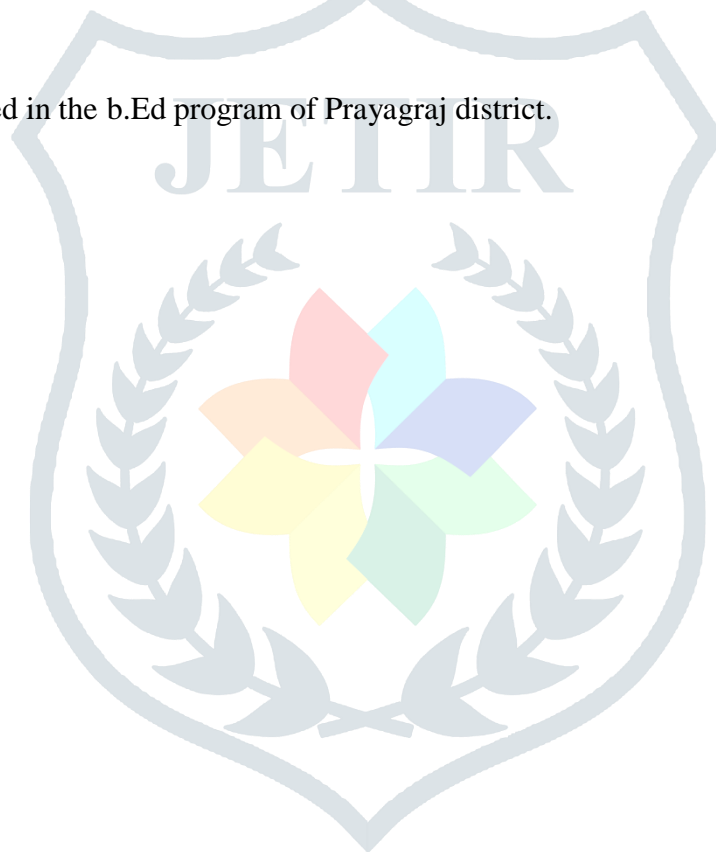
There is a difference in the response of prospective teachers towards 7 domains of the TPACK.

Methodology

The study under investigation intends to collect data from Prospective teachers teaching science lessons during their practice teaching with regard to their TPACK in 7 key domains. Hence the study under investigation comes under the structured method of collecting data by using qualitative method.

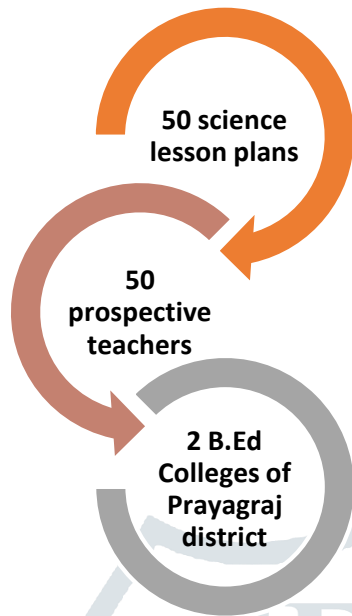
Population

Prospective teachers enrolled in the b.Ed program of Prayagraj district.



Sample

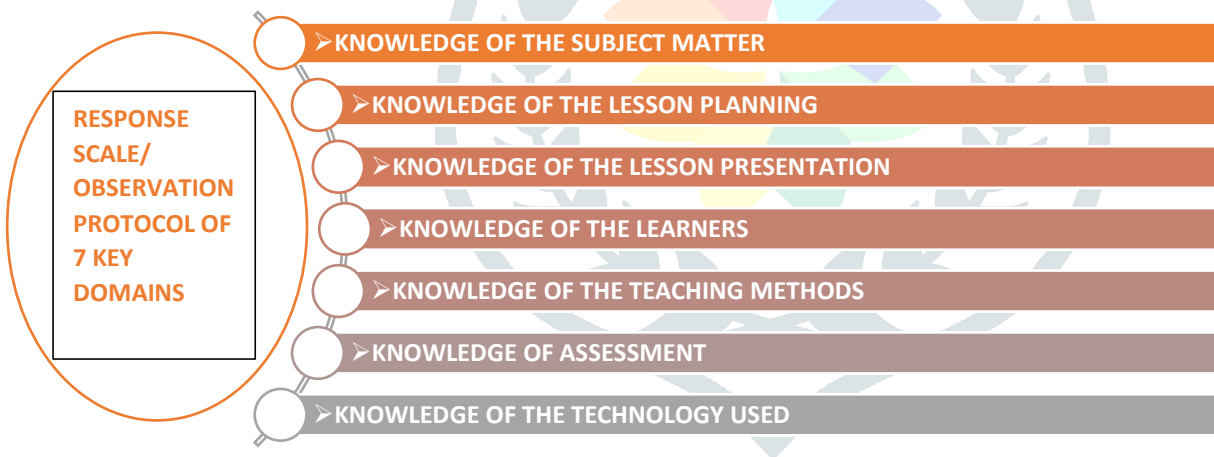
Fig 2



Tool used

Response scale/observation protocol developed by the researcher in the 7 key domains.

Fig 3



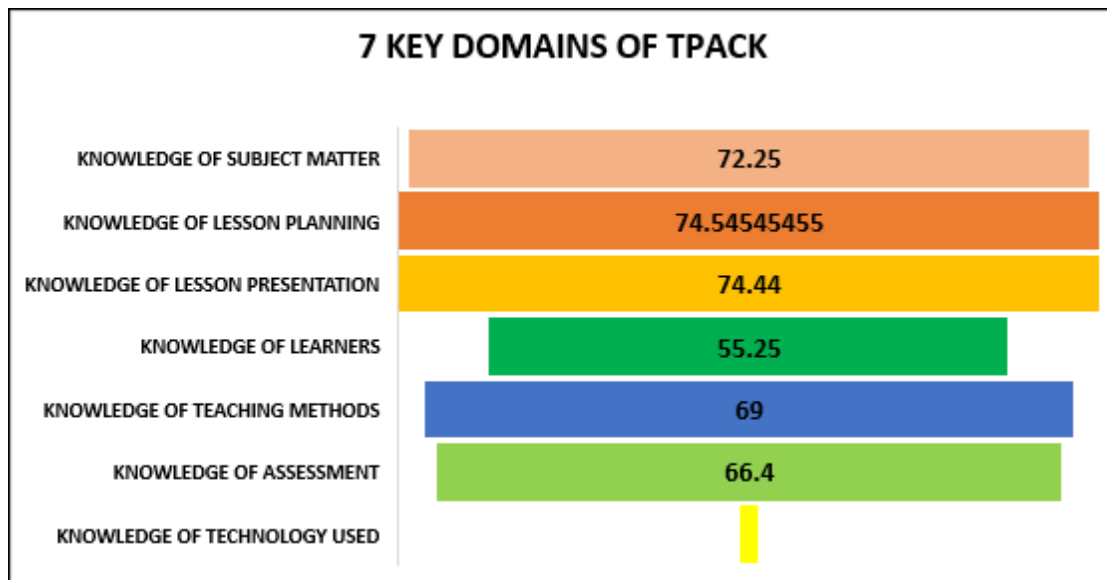
Techniques of Data Analysis

For the purpose of analysis, the investigator has decided to use a descriptive statistical technique. The hypothesis was tested by using the percentage analysis.

Data analysis, discussions, and Interpretation: Table 1

Domains	Knowledge of the subject matter	Knowledge of lesson planning	Knowledge of lesson presentation	Knowledge of learners	Knowledge of teaching methods	Knowledge of assessment	Knowledge of technology used
Percentage	72.25%	74.55%	74.44%	55.25%	69%	66.4%	2.15%

Graph 1



Interpretation of the above graph

Lowest of 7 domains: knowledge of the technology used 2.15%

1. From the above graph, it can be clearly interpreted that the prospective teachers have very less knowledge of technology. The percentage was very low at 2.15%.
2. In relation to their teaching-learning process or in the delivery of their lessons they haven't used any technology-mediated techniques.
3. It was observed that prospective teachers haven't developed class activities and projects involving the use of instructional technologies.
4. Their lesson plans were not designed in a manner that combines science, technologies, and teaching approaches.
5. They haven't created a lesson plan that incorporates web-based tools.
6. Instead of having projectors in the class and internet access they haven't utilized the opportunity to deliver their content appropriately and interestingly. Digital videos weren't used by the prospective teachers in the class.
7. They haven't used a projector for the delivery of the content.

Highest of domains: knowledge of lesson planning 74.54%

1. The highest percentage among the 7 domains was knowledge of lesson planning (74.54%).
2. The pupil-teacher teaches the lesson by considering all the 3 domains of objectives: cognitive, affective, and psychomotor

3. Organization of content was at 3 levels: MUR: memory, understanding, reflective
4. They designed appropriate learning activities and develop strategies to obtain feedback on student learning
5. Introduces the lesson interestingly
6. Accomplish the learning objectives productively
7. The introductory statements were very easy to outline the student's understanding of the concept that the pupil-teacher taught
8. To engage students, specific learning activities (such as drills and practice, quizzes,) used during the classroom teaching

Highest of domains: knowledge of lesson presentation 74.44%

1. Pupil teacher revises the previous day's lesson.
2. Student queries were welcomed and solved
3. Reinforcement was given and proved efficacious.
4. Student engagement was seen and was interactive
5. Engagement of students during lesson presentation by asking a variety of questions
6. Lesson presented was related to the conceptual knowledge/framework
7. Summarizing, reviewing, and demonstrating the understanding of major points took place during the delivery of the content

Highest of domains: knowledge of subject matter 72.25%

1. Pupil teachers had command over their subject knowledge, but there is a need to work on how to use real-life examples related to their lesson planning.
2. Almost all the pupil-teacher had knowledge of how to use their subject knowledge according to the mental level of their students.
3. Pupil teachers need to focus on how to suggest additional learning material to their students.
4. Pupil teacher had knowledge of appropriate pedagogical techniques.

Moderate domains: knowledge of learners 55.25%

1. Learner-centered techniques were used appropriately.
2. Pupil teacher uses the blackboard effectively
3. Uses a variety of teaching aids like charts, diagrams pictures, to make learning effective.
4. The pupil-teacher presents various examples to illustrate the difficult concepts.
5. Pupil-teacher needs to understand the language skills of his/her learner which will ultimately help him to present concepts and theories in a more constructive manner.
6. The pupil-teacher needs to work on an activity-based project or make groups of students related work so that students from different backgrounds learn to work in harmony with cooperation.

Suggestions based on the findings

1. Teachers today need to go beyond simply imparting knowledge; instead, they must be very practical and try to illustrate concepts that students can utilize in their everyday lives. This is because knowledge can now be obtained via internet resources.
2. Cooperation, realignment, and improvement of present efforts to mentor and support teacher trainees in developing their techno-pedagogical abilities must be encouraged between teacher-training institutions and other accreditation or enabling authorities.
3. Teacher Education institutes should set up an orientation program to teach prospective teachers how to use technology tools and other instructional aids, which will help them feel less anxious about using them while instructing.
4. Teacher preparation calls for the development of diverse perspectives in their practice of teaching and knowledge.
5. A technology-based comprehensive teacher's training needs to be focused on.
6. Teacher education needs to stay up with the most recent advancements and trends in order to prepare instructors who are capable of addressing the difficulties of the dynamic society.
7. Combining pedagogical theory, professional skills, and techno-pedagogical skills would serve to build the proper knowledge, attitude, and abilities in teachers in order to promote holistic development.

8. In order to facilitate and support students' learning and to address the pedagogical needs for enhancing the learning of science because teachers are more confident in the learners' epistemological needs, prospective teachers who are teaching science lessons must take advantage of the integration of technology in their classrooms.

Conclusion

Major findings suggest that only 2.15% of the pre-service teachers are tech savvy, or they use techno-educational inputs while preparing their lesson plan or delivering the content. The rest of the 97.85% were unaware of what and how to use technology during their lessons. There is also a need to work on the domain of knowledge of learners. So, findings suggest that there is a need to consider adopting long-term approaches for pre-service teachers enrolled in the B.Ed. program. The flexibility of the system is therefore built in because it is always possible to alter, enhance, and construct new teaching-learning activities.

Last but not the least, a significant concern for teacher education institutes is: how to raise the standard of the teacher education program. It is necessary to focus on the transformation of potential teachers in a number of areas, including preparation, representation, instructional choices, adaptation, and instruction customization.

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