# A study on Pedagogical knowledge of Prospective Teachers with select Background Variables

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**KEYWORDS**

Pedagogical Knowledge, Teaching -learning and Prospective teachers

**ABSTRACT**

Pedagogical knowledge is a cornerstone of effective teaching, encompassing a teacher's ability to apply instructional strategies, assess student learning, and adapt to diverse educational contexts. This study investigates the pedagogical knowledge of prospective teachers, focusing on their preparedness, sources of teaching preference, challenges faced, and opportunities for improvement within teacher education programme. Survey method was adopted for this study. The pedagogical knowledge test was conducted for this study and the sample consists of 1087 prospective teachers selected from colleges of education using simple random sampling technique. The background variables of the study were gender, locality of residence, source of teaching preference, time spent for preparing lesson. The collected data were analyzed using mean, standard deviation, 't'- test and F- test. The findings revealed that there is significance difference found between male and female prospective teachers with respect to pedagogical knowledge, and also there is a significant difference found among source of teaching preference and time spent for preparing lessons with respect to pedagogical knowledge of the prospective teachers.

## Introduction

Teaching profession plays a critical role in shaping future generations, positioning teachers as the cornerstone of societal progress (Darling-Hammond, 2006). Among the many competencies required for effective teaching, pedagogical knowledge stands out as a fundamental pillar. It encompasses an understanding of instructional strategies, classroom management, assessment methods, and the ability to address diverse student needs (Shulman, 1987). For prospective teachers, developing robust pedagogical knowledge during their training is essential to ensure their readiness to navigate the complexities of modern classrooms.

The educational landscape has witnessed significant changes in recent years due to globalization, technological advancements, and evolving pedagogical approaches (Mishra & Koehler, 2006). Teachers are now required to engage with diverse classrooms, integrate technology effectively, and implement inclusive and student-centered learning practices (UNESCO, 2020). These demands underscore the need for teacher education programs to equip prospective teachers with the knowledge and skills necessary for 21st-century education. However, research studies indicate that many teacher education programs fall short in adequately preparing future educators for the challenges of contemporary teaching environments. Studies have identified gaps in pedagogical training, particularly in areas such as differentiated instruction, technology integration, and addressing the needs of students from diverse backgrounds (Ball, Thames, & Phelps, 2008).

## Review of Literature

Kastorff and Stegmann (2024) investigated the Teachers' technological (pedagogical) knowledge–predictors for students' ICT literacy? The results show contrary to our hypotheses, no significant relationship was found between teachers' professional knowledge regarding TK and TPK and students' cross-curricula ICT literacy. By analyzing the relationship between teachers' TK and TPK and students' ICT literacy, the study provides new insights into the

relationship between teachers' cross-curricular knowledge and students' cross-curricular achievements. It discusses further possible explanations and directions for future research.

Max et al. (2024) focused on the pedagogical makerspace: Learning opportunity and challenge for prospective teachers' growth of TPACK, The aim of this study was (1) to describe challenges prospective teachers perceive during project work in a pedagogical makerspace and coping strategies they develop to deal with the challenges, (2) to analyse the development of prospective teachers' , TPACK and attitudes towards the use of ICT in class. The sample consists of German prospective teachers (N = 145). The results show an increase in TPACK, technology acceptance, intention to use digital media and motivation over the course of the project. Coping strategies were mainly found on the taskwork level, for example by adjusting goals, creating subtasks and organising regular feedback meetings for self-monitoring.

Gerhard (2023) investigated the Opportunities to learn, technological pedagogical knowledge, and personal factors of pre-service teachers: understanding the link between teacher education Program Characteristics and student teacher learning outcomes in times of digitalization. This study examines the relationship between student teachers' opportunities to learn (OTL) and technological pedagogical knowledge (TPK) with the aim of obtaining insights into their learning processes and the effectiveness of teachers' preparation upon completing their bachelor studies. A sample of 338 student teachers in their 6th semester at the University of Cologne was used. Findings reveal that measures of OTL relate to TPK. Further factors, such as gender and teacher education program type have no effect on TPK.

Malvaa et al. (2023) analysed on Identifying teachers' general pedagogical knowledge: A video stimulated recall study. The aim of this study is to identify how teachers define and use GPK in their everyday teaching. Data were collected using video-stimulated recall interviews with seven experienced teachers of science, mother tongue, and mathematics. The results show that teachers define GPK as knowledge of teaching, classroom management, and child development despite of the subject. The findings also reveal a variety of dimensions that are used in practice. Also, identified the overlapping areas between the dimensions that concern teachers' intention and activity. These findings are relevant for further research on GPK as well as for teacher education.

Manzano (2023) focused the Technological and pedagogical knowledge: its influence on teaching performance. The descriptive-correlational study was utilized and the study used an adapted survey questionnaire. The findings show a significant correlation between technology and teachers' pedagogical knowledge, In contrast, no significant correlation is observed between technology and pedagogical knowledge to the teaching performance of the faculty. Faculty members of the teacher education programs of the College of Education are often competent when it comes to provide technology and using pedagogy in their classroom teaching and learning activities.

Sulaiman et al. (2022) focused on Examining the influence of the pedagogical beliefs on the Learning Management System usage among University lecturers. A questionnaire was distributed during COVID-19 pandemic, the data was collected from 393 university lecturers. The study examined how the constructivist and traditional pedagogical beliefs influence the model's three constructs: perceived ease of use, perceived usefulness, and actual use. This study has new finding that contributes to TAM, and the reasons are deliberated.

**Significance of the Study**

Teaching profession needs more than just subject matter expertise; it demands a deep understanding of pedagogical knowledge to effectively facilitate learning, adapt to diverse student needs, and manage evolving educational challenges. Pedagogical knowledge encompasses teaching strategies, assessment methods, classroom management, and the ability to connect theory with practice. For prospective teachers, acquiring this knowledge is a cornerstone of their professional preparation.

**Objectives of the study**

The objectives of the study were as follows:

1. To find out the level of Pedagogical knowledge of the prospective teachers with regard to personal variables: gender, locality of residence, source of teaching preference and time for preparing lesson.
2. To find out whether there is any significant difference in Pedagogical knowledge of the prospective teachers with regard to their gender and locality of residence.
3. To find out whether there is any significant difference among the prospective teachers of Pedagogical knowledge with regard to their source of teaching preference and time spent for preparing lesson.

**Hypotheses of the study**

1. There is no significant difference in Pedagogical knowledge of the prospective teachers with regard to their gender, locality of residence.
2. There is no significant difference among the prospective teachers of Pedagogical knowledge with regard to their source of teaching preference and time spent for preparing lessons.

**Method Used**

The researcher adopted survey method for this study. In order to collect data for the study, the investigator used pedagogical knowledge test among the prospective teachers. The collected data were analyzed using mean, standard deviation, 't'- test and F- test.

**Population and Sample**

The study's population consists of all the prospective teachers studying in the colleges of education during the academic year 2023-2024. The sample selected for the study consists of 1087 prospective teachers from the colleges of education in Tirunelveli, Thoothukudi, Tenkasi and Kanyakumari districts.

**Analysis and Results**

**Objective 1**: To find out the level of pedagogical knowledge of prospective teachers with regard to personal variables

**Table 1**

Level of Pedagogical Knowledge of Prospective Teachers with regard to personal variables

| Personal variables | Category | Low | | Moderate | | High | |
|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % |
| Gender | Male | 31 | 34.10 | 29 | 31.90 | 31 | 34.10 |
| | Female | 267 | 26.80 | 214 | 21.50 | 515 | 51.70 |
| Locality of Residence | Rural | 189 | 26.20 | 157 | 21.80 | 375 | 52.00 |
| | Urban | 109 | 29.80 | 86 | 23.50 | 171 | 46.70 |
| Source of teaching Preference | Books | 222 | 26.40 | 189 | 22.50 | 430 | 51.1 |
| | Screen Learning | 34 | 22.20 | 34 | 22.20 | 85 | 55.6 |
| | Newspaper | 18 | 46.20 | 10 | 25.60 | 11 | 28.2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Others | 24 | 44.40 | 10 | 18.50 | 20 | 37 |
| Time spent for preparing lesson | 90 mins per day | 47 | 23.60 | 41 | 20.60 | 111 | 55.80 |
| | 60 mins per day | 138 | 24.90 | 129 | 23.20 | 288 | 51.90 |
| | 30 mins per day | 113 | 33.90 | 73 | 21.90 | 147 | 44.10 |

It is inferred from the above table that more than two fifths (28%-57%) of the prospective teachers have a high level of pedagogical knowledge in terms of personal variables namely gender, locality of residence, source of teaching preference and time spent for preparation on lesson.

**Objective 2**: To find out whether there is any significant difference in Pedagogical knowledge of the prospective teachers with regard to their gender and locality of residence.

**$H_0$ 1**: There is no significant difference in the pedagogical knowledge of prospective teachers with regard to gender

**Table 2**

t- Test Analysis on the Score of Pedagogical Knowledge of prospective teachers with regard to Gender

| Variable | Gender | N | Mean | SD | t-value | p- value |
|---|---|---|---|---|---|---|
| Pedagogical Knowledge | Male | 91 | 17.45 | 6.585 | 3.445 | .001 |
| | Female | 996 | 19.95 | 7.035 | | |

*NS- Not-Significant at 5% level* *S – Significant at 5% level*

It is inferred from the above table that p-value (0.001) is less than 0.05 hence the null hypothesis is rejected**.** It shows that there is a significant difference in the Pedagogical Knowledge of prospective teachers with regard to gender.

**$H_0$2**: There is no significant difference in the pedagogical knowledge of prospective teachers with regard to the locality of residence

**Table 3**

*t- Test Analysis on the Score of Pedagogical Knowledge of prospective teachers with regard to Locality of Residence*

| Variable | Locality of residence | N | Mean | SD | t-value | p- value |
|---|---|---|---|---|---|---|
| Pedagogical Knowledge | Rural | 721 | 20.01 | 7.064 | 1.801 | .072 |
| | Urban | 366 | 19.20 | 6.939 | | |

*NS- Not-Significant at 5% level* *S – Significant at 5% level*

It is inferred from the above table that p-value is greater than 0.05 for the Pedagogical Knowledge of prospective teachers and hence the null hypothesis is accepted**.** It shows that there is no significant difference in the Pedagogical Knowledge of prospective teachers with regard to the locality of residence.

**Objective 3**: To find out whether there is any significant difference among the prospective teachers of Pedagogical knowledge with regard to their source of teaching preference and time spent for preparing lesson.

**$H_0$3**: There is no significant difference in the pedagogical knowledge of prospective teachers with regard to the source of teaching preference

**Table 4**

*F- Test Analysis on the Score of Pedagogical Knowledge of prospective teachers with regard to the Source of Teaching Preference*

| Variable | Source of variable | Sum of Squares | df | Mean Square | F value | p value |
|---|---|---|---|---|---|---|
| Pedagogical Knowledge | Between Groups | 901.971 | 3 | 300.657 | 6.171 | .000 |
| | Within Groups | 52762.870 | 1083 | 48.719 | | |

*NS- Not-Significant at 5% level* *S – Significant at 5% level*

It is inferred from the above table that p-value (0.000) is less than 0.05 for the pedagogical knowledge of prospective teachers and hence the null hypothesis is rejected**.** It shows that there is a significant difference in the Pedagogical Knowledge of prospective teachers with regard to the source of teaching preference.

**Table 4 (a)**

Scheffe's Test for the Pedagogical knowledge of prospective teachers with regard to Source of teaching preference

| Source of Teaching Preference | Source of Teaching Preference | Mean Difference | Std. Error | p-value |
|---|---|---|---|---|
| Books | Screen Learning | -.978 | .613 | .468 |
| | News Paper | 3.384* | 1.143 | .033* |
| | Others | 2.438 | .980 | .103 |
| Screen Learning | Books | .978 | .613 | .468 |
| | News Paper | 4.362* | 1.252 | .007* |
| | Others | 3.416* | 1.105 | .023* |
| News Paper | Books | -3.384* | 1.143 | .033* |
| | Screen Learning | -4.362* | 1.252 | .007* |
| | Others | -.946 | 1.467 | .937 |
| Others | Books | -2.438 | .980 | .103 |
| | Screen Learning | -3.416* | 1.105 | .023* |
| | News Paper | .946 | 1.467 | .937 |

In the Table, 4(a), the p-value is less than 0.05 for books, screen learning, newspaper and others, the null hypothesis is rejected at 5% level of significance. It shows that there is a significance difference between the pedagogical knowledge of prospective teachers with regard to Source of Teaching Preference.

**$H_0$ 4**: There is no significant difference in the pedagogical knowledge of prospective teachers with regard to time spent for preparing lesson

**Table 5**

*F- Test Analysis on the Score of Pedagogical Knowledge of prospective teachers with regard to* time spent for *Preparing Lesson*

| Variable | Source of variable | Sum of Squares | df | Mean Square | F-value | p-value |
|---|---|---|---|---|---|---|
| Pedagogical Knowledge | Between Groups | 580.315 | 2 | 290.157 | 5.925 | .003 |
| | Within Groups | 53084.526 | 1084 | 48.971 | | |

*NS- Not-Significant at 5% level* *S – Significant at 5% level*

It is inferred from the above table that p-value (0.003) is less than 0.05 for the pedagogical knowledge of prospective teachers and hence the null hypothesis is rejected**.** It shows that there is a significant difference in the Pedagogical Knowledge of prospective teachers with regard to time spent for preparing lesson.

**Findings**

- 34.10 % and 51.70 % of prospective teachers who are male and female have high level of pedagogical knowledge as a whole respectively. Also, significant difference was found between male and female prospective teachers in their pedagogical knowledge.
- 52 % and 46.70 % of prospective teachers who are from rural and urban locality of residence have high level of pedagogical knowledge as a whole respectively. Also, no significant difference was found between prospective teachers of rural and urban locality with regard to their pedagogical knowledge.
- 51.1 %, 55.6 %, 28.2 % and 37 % of prospective teachers who are using books, screen learning, newspapers and others as the source of teaching preference have high level of pedagogical knowledge as a whole respectively. Also, significant difference was found between prospective teachers who use books, screen learning, newspaper and others source of teaching preference with regard to their pedagogical knowledge.
- 55.80%,51.90% and 44.10% of prospective teachers who are spending 90 minutes per day, 60 minutes per day,30 minutes per day preparing lesson have high level pedagogical knowledge as a whole respectively. Also, significant difference was found between prospective teachers who spent 90 minutes, 60 minutes and 30 minutes to prepare lesson with regard to their pedagogical knowledge.

**Recommendations**

- It is recommended that educational institutions implement gender-sensitive training programmes aimed at enhancing pedagogical knowledge for both male and female prospective teachers to promote equity in teaching competencies.
- It is recommended that teacher education programs integrate diverse teaching resources, including books, screen learning, and newspapers, into their curriculum to enhance prospective teachers' pedagogical knowledge and prepare them for varied instructional methods.
- It is recommended that teacher education programmes provide targeted time management strategies and resources to help prospective teachers to optimize their lesson preparation, regardless of whether they dedicate 30, 60, or 90 minutes to this task, to improve their pedagogical knowledge.

**Conclusion**

The study highlights the importance of understanding the interplay between pedagogical knowledge and background variables such as gender, locality of residence, source of teaching preference, and time spent for preparing lessons. The studies underscore that these variables significantly influence the pedagogical preparedness of prospective teachers, shaping their ability to plan, deliver, and reflect on effective teaching practices. The findings reveal that

while teacher education programs provide foundational understanding of instructional strategies, assessment techniques, and classroom management, significant gaps persist in areas such as inclusive practices, technology integration, and adapting to diverse learner needs. From this study, it was found that there was a significant difference in the pedagogical knowledge of prospective teachers with regard to gender, source of teaching preference and time spent for preparing lessons. Hence, the pedagogical knowledge is effectively adopted for the development and readiness of prospective teachers in the modern education.

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