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Research Article

Digital Teaching Competency Of Female Prospective Teachers In Tirunelveli District

Mrs. E. Michael Jeya Priya[1*], Dr. M. Maria Saroja[2]

[1*]Research Scholar &Assistant Professor of Biological Science, St.Ignatius College of Education (Autonomous), Palayamkottai, Tirunelveli-2, (Affiliated to Tamil Nadu Teachers Education University), Chennai. (Reg.No. 210ACP039)
[2]Research Director, IQAC Coordinator &Associate Professor of Biological Science, St.Ignatius College of Education (Autonomous), Palayamkottai, Tirunelveli-2, (Affiliated to Tamil Nadu Teachers Education University), Chennai, Contact Number 9443960253 email-pri.inigo@gmail.com

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ARTICLE INFO **ABSTRACT**

Digital Teaching Competency is an essential challenge for the educational systems of the 21st century. Nowadays, open-access learning environments based on virtual reality and certified online real-time learning outcomes maximize opportunities for all types of learners that the facilitators or teachers in traditional to digital. Modern classrooms increasingly incorporate technology in daily lessons. Prospective teachers must be adept at using digital tools and platforms to create interactive and engaging learning experiences. In this regard, the investigators used a simple random sampling technique. Michael Jeya Priya, E., and Maria Saroja, M developed a Digital Competency Scale (DSC) (2021). Data were collected from 250 female prospective teachers. Mean, 't' test, and $\chi 2$ were used to analyze the data. The study showed that the level of digital competency of female prospective teachers is moderate. There is a significant difference between rural and urban, UG and PG, Arts and Science group students in their digital competency among prospective teachers. There is no significant difference between aided and self-financed, nuclear and joint family, in their digital competency among prospective teachers. The study is limited to the second-year prospective teachers in Tirunelveli district. Further studies can be done to determine the school teachers' digital competency. The study highlighted that digital competency is the fundamental requirement for prospective teachers to handle the learners. It empowers them to deliver high-quality education, adapt to diverse teaching environments, and prepare students for a technology-driven future. Thus, prospective teachers must acquire the necessary skills, knowledge, and competence in using digital technologies and tools to enhance their Digital Teaching Competency, which will be beneficial for both their learning and teaching.

Keywords- *digital competency, open-access learning environments, virtual reality.*

Introduction

Digital competency is a multifaceted concept that includes technological knowledge and skills and the practical application of digital technologies across various contexts. Today's students are surrounded by digital technologies and networks that have become highly prevalent and indispensable for imparting education (Yelubay, Y.2022). This competency extends beyond mere usage of devices and applications to encompass proper pedagogical use, ensuring that digital tools are utilized educationally and soundly. Prensky (2001) introduced the terms "digital natives" and "digital immigrants" and discussed the differences between them. He further claimed that "digital learners" are accustomed to acquiring information very quickly, and they like to process or multitask in parallel and evaluate information in fundamentally distinct ways from their ancestors. These disparities are substantially more profound and pervasive than most educators recognize. Alkalai (2004) refers to it as "survival skills in the digital era," while Deursen and Dijk (2010) refer to it as a "vital asset in the information society." A digital immigrant is an individual who was not born in the digital age but was attracted by and embraced most features of modern technology at some time in his or her life. The digital age demands that users develop a new thinking style and the ability to adapt to new literacies commanded by modern technologies (Coiro et al., 2008). It applies to both students and teachers. The formation of teachers' digital skills, depending on the needs of the modern world, will inevitably rely on a highly

digitally expert teacher. In this respect, "multifunctional, over subject and multidimensional key competencies must be developed" within any training areas' frame (Galkina, 2017). Procuring these kinds of competencies definitely will help to solve problems in an individual's professional and social lives and Digital Teaching Competency is one of them.

Rationale of the study

The education system was now witnessing a paradigm shift from the traditional chalk-and-board teaching methodology to the digital technology and smart board. Teacher Education is to learn to teach and teach to learn. Digital Teaching Skills include providing digital training and practice in the different techniques, approaches, and strategies that would help the teachers to plan and impart instruction, provide appropriate reinforcement and conduct an effective online assessment. It includes effective virtual classroom, management skills, preparation and use of instructional materials, and communication skills. Digital Teaching Competency is an essential challenge for the educational systems of the 21st century. Nowadays, open-access learning environments based on virtual reality and certified online real-time learning outcomes maximize opportunities for all types of learners that the facilitators or teachers in traditional to digital. Digitally competent teachers affect students' subject learning and use of ICT in schools; teacher education programs and student teachers are a "natural place to start for integrating technology into education" and need to critically reflect on how they structure and facilitate their approaches and strategies. Online learning platforms have emerged as effective tools for both in-class and remote learning. As expressed by Wu et al. (2017) virtual learning tools can enhance academic performance, foster collaborative learning through peer participation, and hold teachers accountable for their students' learning. Additionally, utilizing social media in online learning can improve interactivity among students and researchers with supervisors, contributing to enhanced academic performance. Digital pedagogical skills, coupled with ICT tools, have been identified as a solution to enhance learning experiences. Njoku (2015) highlights that these skills allow students to communicate, edit, annotate, arrange, and generate texts quickly and freely. Zamora-Antunano et al (2022) reveals that a significant percentage of higher education institutions allow the use of virtual learning platforms. Notably, 80% of teachers have received training for using platforms like Moodle, Google Classroom, and Blackboard. Google Classroom is recognized as a valuable tool for promoting blended learning and professional development (Iftakhar S,2016). The use of digital tools in education offers numerous benefits, including enhanced learning experiences, access to a wealth of information, improved collaboration, and cost-effectiveness. Pre-service teachers must be able to integrate technology into teaching and learning. They must understand their role in technologically oriented classrooms and develop skills to make use of Internet technology, explore it, and perform information processing and management to use in teaching-learning.

Statement of the Problem

In today's digital era, teaching requires not only pedagogical knowledge but also competency in using digital tools effectively. Female prospective teachers, especially in regions like Tirunelveli District, may face varying levels of digital exposure due to differences in educational, social, and institutional backgrounds. Despite national initiatives promoting digital education, there is limited research assessing the digital teaching competency of this group. This study aims to evaluate the digital teaching competency of female prospective teachers in Tirunelveli and examine how it varies across selected demographic and academic variables.

Literature review

Artacho et. al., (2021) conducted a study on teacher's perceptions of Digital Teaching Competency at the lifelong learning stage. The results showed that the level shown by teachers is low. The findings also determined the importance of factors such as age, teacher training and school type in further developing Digital Teaching Competency skills. Dominguez and Bezanilla (2021) researched "Digital Teaching Competency in the Training of pre-service Teachers: perceptions of Students in the Degrees of Early Childhood Education and Primary Education". The findings of the results revealed that there is no statistically significant difference regarding gender and type of university education degree.

Kozuh et. al., (2021) worked on "Fourth Industrial Revolution and Digital Teaching Competency s of teachers". The findings of the study revealed significant differences in the teacher's Digital Teaching Competency to the subjects they teach, teaching experience, gender, and professional training. Ezhilarasan and Vijayarani (2020) discussed the "awareness and utilization of techno pedagogy among secondary level teachers in Coimbatore district". The findings of the study also revealed that there is a significant correlation between the awareness of techno-pedagogy and the utilization of techno-pedagogy among secondary-level teachers.

Almenara (2020) conducted a study on the "development of the teacher Digital Teaching Competency validation of Dig Comp Edu check-in questionnaire in the university context of Andalusia (Spain)". The study revealed that the instrument had high indices of reliability, globally and in the different dimensions that comprise it. Beri and Sharma (2019) focused on a study on technological pedagogical and content knowledge among teacher-educators in Punjab region. The finding of the study also revealed that there is a significant difference in technological pedagogical and content knowledge of teacher-educators concerning gender, locality, stream, and type of college.

Gupta and Singh (2019) researched on "competency of teacher educators and student teachers towards E-learning tools". The findings of the study revealed that teacher educators are most competent in the dimensions of basic computer competency, followed by the dimensions of basic internet competency, advanced computer competency, and advanced internet competency. Rajeswaran (2019) worked on "Lack of Digital Teaching Competency: the hump in a University-English for Specific purpose-classroom".
The findings of the study revealed that there is a sharp significant difference in the attitude of students and teachers towards computer-assisted language learning, mobile learning and blended learning. According to the review collected, it was identified by the investigators that there was a gap between the factors related to teacher effectiveness and other research variables. Based on the reviews collected by the researchers who have studied the use of techno-pedagogical skills and teacher effectiveness in the teaching-learning process, many researchers have also studied Digital Teaching Competency but nobody worked on the following areas of Digital Teaching Competency, techno-pedagogical skills, and teacher effectiveness in the teaching-learning process.

Research Methodology

Research Design
This study employs a quantitative and descriptive research design to assess the digital teaching competency of female prospective teachers in the Tirunelveli District.

Objectives of the study
- To find out the level of digital teaching competency among female prospective teachers.
- To find out whether there is any significant difference between female prospective teachers in their digital teaching competency with reference to the following background variables (i) Locality of Residence (ii) Nature of College (iii) Type of family (iv) Educational qualification (v) Group of study

Variables of the Study
Independent Variables: Educational Qualification, Type of Institution (Government, Aided, Self-financed), Prior Digital Learning Experience (Yes/No or extent of experience)

Dependent Variable: Digital Teaching Competency (measured using the Digital Teaching Competency Scale - DTCS).

Hypothesis
H_{01}: There is no significant difference in digital teaching competency among female prospective teachers based on their locality of residence (urban/rural).
H_{02}: There is no significant difference in digital teaching competency among female prospective teachers based on the nature of the college they are studying in (government/aided/self-financed).
H_{03}: There is no significant difference in digital teaching competency among female prospective teachers based on their type of family (nuclear/joint).
H_{04}: There is no significant difference in digital teaching competency among female prospective teachers based on their educational qualifications.
H_{05}: There is no significant difference in digital teaching competency among female prospective teachers based on their group of study (arts/science).

Population and Sampling
- The population for this study consists of female prospective teachers in Tirunelveli District.
- The researcher adopted a simple random sampling technique to ensure an unbiased selection process.
- A total of 250 female prospective teachers were randomly selected as the sample.

Instrument for Data Collection
- The Digital Teaching Competency Scale (DTCS), developed and validated by Michael Jeya Priya, E., and Maria Saroja, M. (2022), was used to measure digital teaching competency.
- The DTCS is a standardized tool that ensures reliability and validity in assessing the digital teaching skills of the participants.

Data Analysis Techniques
To interpret the collected data, the following statistical methods were employed:
- Mean (M): To measure the average level of digital teaching competency among the respondents.
- Standard Deviation (SD): To determine the variability in digital teaching competency scores.
- 't'-Test: To analyze significant differences in digital teaching competency based on selected demographic variables such as educational qualification, institution type, and prior digital learning experience.

Results and Analysis

Table.1. showing the percentage level of digital competency among prospective teachers in Tirunelveli District.

Digital Competency	Low		Average		High	
	N	%	N	%	N	%
	57	22.80	141	56.40	52	20.80

Figure.1 shows the percentage level of digital teaching competency among prospective teachers in Tirunelveli district.

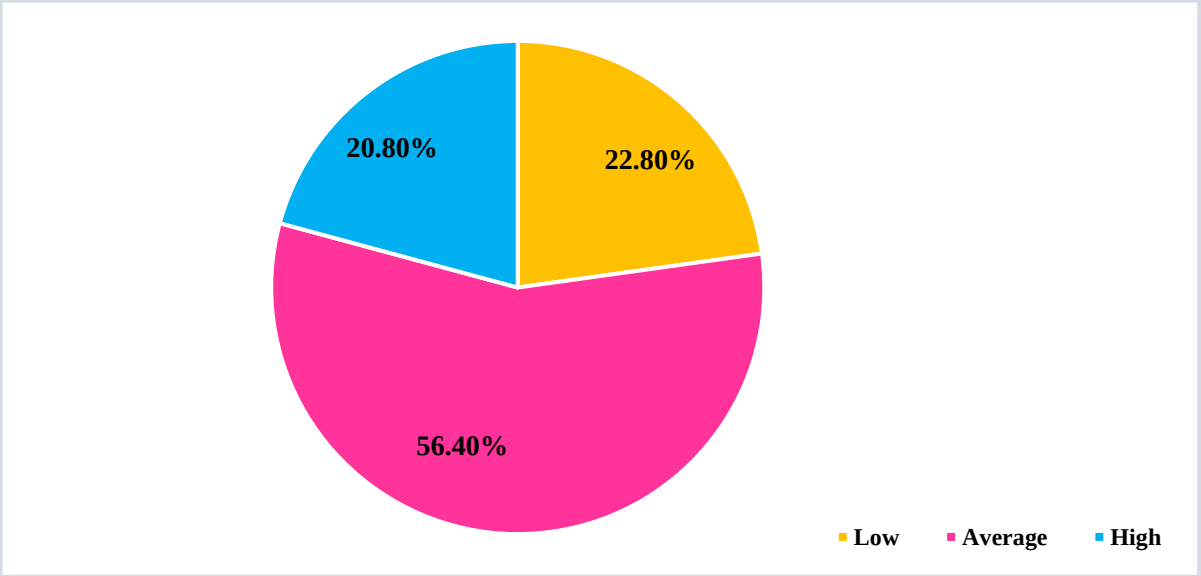

Table.2. Difference between rural and urban female prospective teachers in their digital teaching competency.

Locality	N	Mean	SD	Calculated 't' Value	Table Value	Remark
Rural	118	59.79	6.99	3.62	1.96	S
Urban	132	62.83	6.17			

From the above table, it is inferred that the calculated 't' value is lesser than the table value at 5% level significance for 248 degrees of freedom. There is a significant difference between rural and urban students in their digital competency of the prospective teachers. The mean score value of the urban female prospective teachers 62.83 is higher than the rural female prospective teachers 59.79 hence null hypotheses is rejected.

Table.3. Difference between girls and co-education female prospective teachers in their digital teaching competency

Type of College	N	Mean	SD	Calculated 't' Value	Table Value	Remark
Girls	133	61.70	7.41	0.80	1.96	NS
Co-education	177	61.03	5.89			

From the above table, it is inferred that the calculated 't' value is lesser than the table value at 5% level significance for 248 degrees of freedom, the null hypotheses is accepted. Hence there is no significant difference between girls and coeducation female prospective teachers in their digital teaching competency.

Figure.2.Showing the digital teaching competency of female prospective teachers in Tirunelveli District.

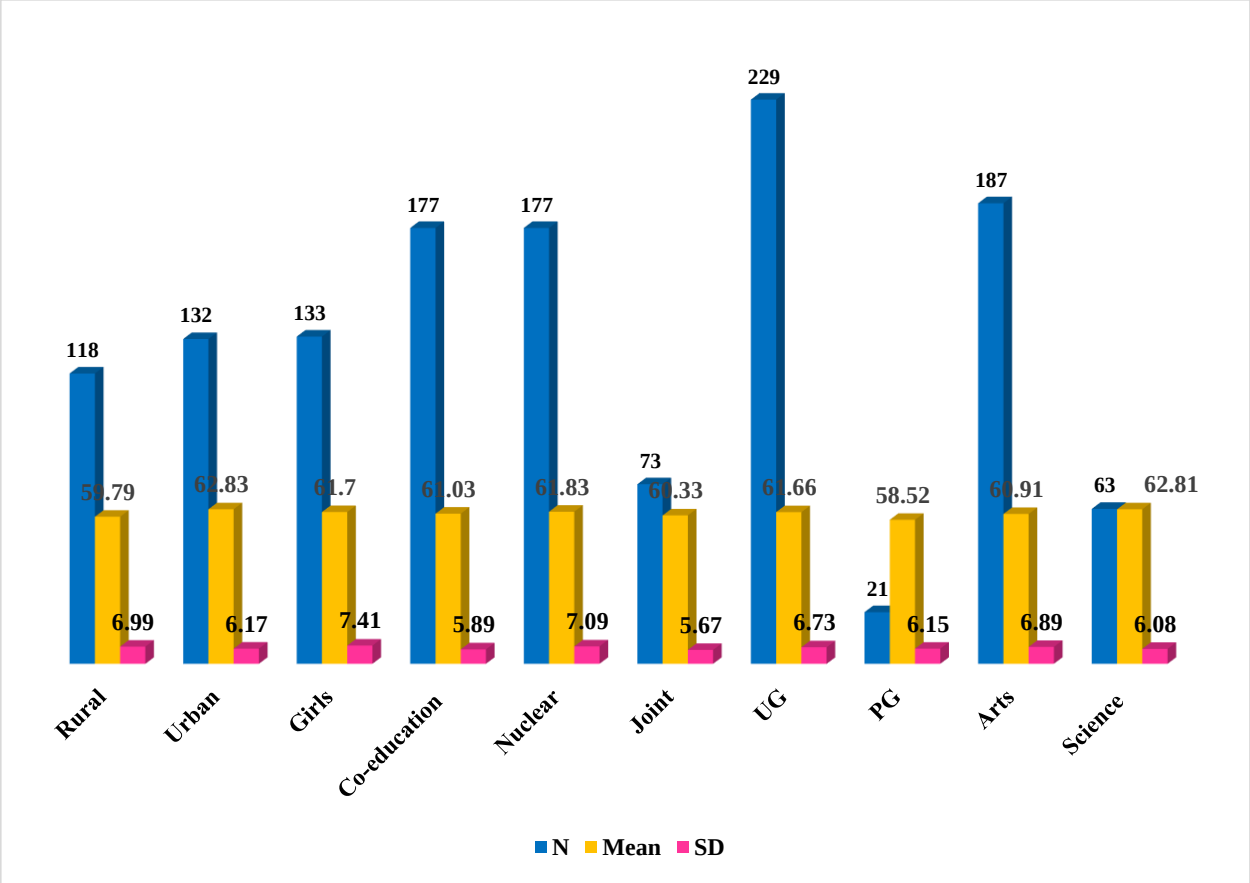

Table 4. Difference between nuclear and joint family prospective teachers in their digital teaching competency

Type of Family	N	Mean	SD	Calculated 't' Value	Table Value	Remark
Nuclear	177	61.83	7.09	1.76	1.96	NS
Joint	73	60.33	5.67			

From the above table, it is inferred that the calculated 't' value is lesser than the table value at 5% level significance for 248 degrees of freedom, the null hypothesis is accepted. Hence there is no significant difference between nuclear and joint-family female prospective teachers in their digital teaching competency.

Table 5. Difference between UG and PG female prospective teachers in their digital teaching competency.

Educational Qualification	N	Mean	SD	Calculated 't' Value	Table Value	Remark
UG	229	61.66	6.73	2.21	1.96	S
PG	21	58.52	6.15			

From the above table, it is inferred that the calculated 't' value is lesser than the table value at 5% level significance for 248 degrees of freedom. Hence there is a significant difference between UG and PG female prospective teachers in their digital competency. The mean score value of the UG female prospective teachers 61.66 is higher than the PG female prospective teachers 58.52 hence null hypothesis is rejected.

Table 6. Difference between Arts and Science group female prospective teachers in their digital teaching competency.

Group of Study	N	Mean	SD	Calculated 't' Value	Table Value	Remark
Arts	63	60.91	6.08	2.07	1.96	S
Science	187	62.81	6.89			

From the above table, it is inferred that the calculated 't' value is lesser than the table value at 5% level significance for 248 degrees of freedom. Hence there is significant difference between arts and science group female prospective teachers in their digital teaching competency. The mean score value of the Science group female prospective teachers 62.81 is higher than the Arts group female prospective teachers 60.91 hence null hypotheses is rejected.

Recommendations of the Study

The findings of the present study reveal that the research variables, namely Digital Teaching Competency and techno-pedagogical skills influence teacher effectiveness. On the basis of the major findings of the study, it is clear that there is a need to take some measures to intensify proper implementation of digital technology in teacher education.

- This study will help policymakers and teacher educators to take care of these areas and more emphasis should be given to the development of Digital Teaching Competency of B.Ed. prospective teachers.
- Practical classes must be emphasized in the curriculum of the B.Ed. prospective teachers rather than theory papers.
- Various workshops, symposiums, seminars, webinars, conferences, hands-on training, and skill development programs will surely help to deal with the professional growth of teachers.
- Educational institutions should make provision for technical assistance to teachers. Institutions can appoint a full time or part time assistance who is technically sound, capable of orienting the teachers time to time and provide assistance whenever required.
- It also helps the administrators to prepare digital skill enhancement programme for teacher educators so they can effectively manage the changes in sound knowledge and technological changes in the world.
- It also helps to provide more support to both pre-service as well as in-service trainings, guidance and counselling programs, refresher courses and exchange programs with other good institutions may also be well organized.

Conclusion

The study shows that the level of Digital Teaching Competency of prospective teachers is moderate. Nowadays, the classroom scenario is changing from traditional to digital. There is a technological gap between the progress of society and the instructional activities of the teacher in the classroom. The technology orientation needs to improve to equip themselves to face the students belonging to the digital age and also to face the challenges in the modern classroom. In the classroom, both teachers and students use Information Communication Technology (ICT) and Multimedia for teaching and learning. Teaching occupies an honorable position in society. By using and acquiring the knowledge of ICT, the prospective teachers will become effective teachers. ICT is one of the important factors for producing rapid changes in our society. ICT helps teacher to update their knowledge, and skills to use modern digital tools and resources. Teachers have to be able to integrate techno-pedagogical skills with digital skills and utilize these skills in practice. The important contribution of teacher education is its development of teacher's abilities to examine teaching from the perspective of learners who bring diverse experiences and frames of reference to the classroom. The 21st Century's teacher should be a "techno-pedagogue". Technology won't replace teachers. But Teachers who use technology will probably replace teachers who do not. It is important to recognize that, Teacher Educators and prospective teachers are becoming more knowledgeable of Information and Communication Technology outcomes (ICTs), and they continue to have knowledge or skills with which to integrate those technologies into their teaching practice. Prospective teachers prepare for careers, requiring them to acquire digital knowledge, learn innovative technologies, and facilitate rapid process of information. Quality teacher education is essential for the prospective teacher. It is needed to update their digital knowledge and techno pedagogical skills in the school curriculum and technological change.

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