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TEACHER EDUCATORS' DIGITAL COMPETENCE: A STUDY FROM TEACHER EDUCATION INSTITUTIONS OF UTTARAKHAND

Ajit Kumar Saini[1], Lalit Mohan Pandey[2]

[1]Research Scholar & Assistant Professor, Department of Teacher Education, Lal Bahadur Shastri Government P.G. College, Halduchaur, Nainital, Uttarakhand
[2]Professor, Department of Teacher Education, Lal Bahadur Shastri Government P.G. College, Halduchaur, Nainital, Uttarakhand

ABSTRACT

Digital competence became a most prominent skill in the context of education. As a key competence of the 21st century, teacher educators must be skilled in the digital world. In the teacher training programme, the role of teacher educators becomes more important as they train and impart their learning experiences to meet the necessary competence of teaching in perspective teachers. Digital competency is a much-needed requirement for teachers in the present era. This study was conducted among 150 teacher educators, working in the teacher education institutions of the Kumaon region of Uttarakhand. It investigated the level of digital competence among teacher educators concerning their gender, type of institutions, teaching experience and their teaching stream. The findings of the study revealed that an intermediate level of digital competence had been found among teacher educators. Gender, type of institutions, teaching experience and teaching stream had no significant impact on the digital competency of teacher educators.

Keywords: Teacher educators, Digital Competence (DIGICOMP), Teacher Education Institutions

Corresponding Author
Ajit Kumar Saini,
ajitsainieducation2014@gmail.com

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1. INTRODUCTION

The rapid development of information and communication technology (ICT) has transformed the education landscape (Zhao et al, 2021). The digitalisation process has given rise to an enhanced emphasis on and demand for digital-centric competencies. In the digital age, developing digital competence among higher education stakeholders is crucial, enabling them to leverage digital resources effectively (Srivastava and Dangwal, 2021). Teacher education is also an important part of higher education and is dedicated to preparing future teachers. There is increasing emphasis on the expectation that educators use technological resources to facilitate emerging teaching and learning (Drent and Meelissen, 2008). Teacher educators are not only teachers. they are second-order teachers, responsible for educating and training future generations of teachers (Murray and Male, 2005). Beyond their teaching roles, teacher educators work as role models for students in integrating technology into teaching and cultivating students' digital competence. Embodying the

pedagogical practice they aim to instil in their students is central to teacher educators' role-modelling capacity (Lunenberg et al, 2007; Wright and Wilson, 2007). Teacher educators do not merely convey course content but also instruct and exemplify the use of technology, pedagogical convictions, and instructional strategies (Bai and Ertmer, 2008; Garcia and Rose, 2007). This study examines the emerging body of research on teacher educators' level of digital competence. There is a lack of studies on the digital competencies of teacher educators in teacher education belonging to the Kumaun region of Uttarakhand. It contributes to the literature that currently exists; the study seeks to identify the level of digital competencies at different parameters associated with teacher educators.

2. DIGITAL COMPETENCE

Digital competence is an emerging concept that encompasses a diverse range of knowledge, skills, and capabilities related to technology, computing, literacy, media, information, and communication. This multifaceted construct represents the most recent conceptualisation employed to describe the technological proficiencies of individuals. In 2006, the European Parliament and the Council defined digital competence as "Digital competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. Basic skills in ICT underpin it: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet." (European Parliament and the Council, 2006). The European Union has identified digital competency as one of the eight essential competencies needed for lifelong learning. According to the Digital Agenda for Europe (European Commission, 2010), digital competency is one of the most important skills people need in a knowledge-based society (European Commission, 2010). Ferrari, A. (2012) provided a comprehensive description of digital competence. "Digital Competence is the set of knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage -information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socialising, consuming, and empowerment." (Ferrari, A. 2012) Digital competence is a complex and multifaceted idea that involves not only the integration of technical, cognitive, and digital skills but also includes meta-cognitive processes and awareness of social, emotional, and ethical aspects tied to the use and comprehension of digital technologies. It relates to the assured, critical, and innovative use of the entire spectrum of digital tools for accessing, storing, retrieving, creating, sharing, and evaluating information, enabling effective communication, problem-solving, critical thinking, and creative thinking in various aspects of life. Therefore, in the context of the current study, digital competence signifies the assured, critical, creative, constructive, and ethical application of ICT by teacher educators in teacher education to achieve objectives on academic and research endeavours, employability, learning, inclusion, and participation in a knowledge-driven society (Ananiadou and Claro, 2009; Ala-Mutka, 2011; Lakkala et al, 2011; UNESCO 2011; Ferrari et al, 2012).

3. TEACHER EDUCATORS

In this study, teacher educators refer the teachers who work in teacher education institutions in the Kumaun region of Uttarakhand and teach the pre-service teachers in the bachelor of education programme.

4. REVIEW OF THE LITERATURE

Dias-Trindade, S. & Moreira, J. A. (2020). [18] found that teachers' digital competence level is moderate.

Çebi, A. & Reisoğlu, I. (2020) [19] Evidence suggests that pre-service teachers' self-reported digital competence is moderate and exhibits substantial variation based on factors such as gender, academic discipline, and their perceived level of digital proficiency.

Zhao, Y.; Sánchez Gómez, M.C.; Pinto Llorente, A.M.; Zhao, L. (2021) [20] found that students' perceptions of their digital competencies, including information and data literacy, communication and collaboration, and safety, were favourable. Additionally, there were notable differences in students' self-assessments of digital competence, which were associated with factors such as gender, grade level, geographic location, and prior training based on the DigComp framework.

Srivastava, S. and Dangwal, K.L. (2021) [21] suggested in their study that the higher education teachers investigated possess an intermediate level of digital competence, with only 8.44% demonstrating an advanced level of such proficiencies.

Julio Cabero-Almenara et al. (2021) Study conducted in Andalusia (Spain) showed that higher education educators, irrespective of gender, possessed an intermediate level of digital competence [22].

5. SIGNIFICANCE OF THE STUDY

This study emphasises the digital competence level of teacher educators belonging to the Himalayan Kumaun region of Uttarakhand. The study specifically targeted teacher educators working in government and private teacher education institutions, who play a crucial role in preparing future teachers. Hence, this study will help frame the teacher training programme to enhance the digital competency of teacher educators.

6. OBJECTIVES OF THE STUDY

1. To find out the status of the level of digital competence among teacher educators
2. To assess if the mean score of the gender of teacher educators differs significantly concerning digital competence.
3. To assess if the type of institution of teacher educators had substantial mean differences in digital competence.
4. To assess if the teaching stream of teacher educators had substantial mean differences in digital competence.
5. To assess if the teaching experience of teacher educators differed significantly across digital competence.

6. HYPOTHESIS OF THE STUDY

H-1: There is no significant mean difference among teacher educators concerning gender
H-2: There is no significant mean difference among teacher educators concerning with type of institutions
H-3: There is no significant mean difference among teacher educators concerning with teaching stream
H-4: There is no significant mean difference among teacher educators concerning years of experience

7. RESEARCH METHOD AND PROCEDURE

The methodology of the research is crucial to the success of the research. The empirical survey method was used in this study. Participants filled out their responses "Digital Competence Assessment Questionnaire" for the study. Descriptive and Exploratory research are addressed in the investigation. This descriptive survey study assessed Teacher educators' digital competence. A literature review helped researchers comprehend digital competence and Teacher education. The investigator identified gaps in the literature and created study questions. A closed-ended survey was conducted. Consent of each participant was taken before filling out the questionnaire. The questions assessed the digital competence level of the participants belonging to the teacher education institutions of the Kumaon region of Uttarakhand.

8. POPULATION AND SAMPLE

Teacher educators were the population of the given survey. 150 teacher educators from different teacher education institutions of the Kumaon region of Uttarakhand participated in the given survey. This study focused on Kumaon region, Uttarakhand Teacher educators. The researcher randomly sampled Kumaon and Soban Singh Jeena University-affiliated government and private B.Ed. colleges. A stratified random sampling ensured that all teacher educators had an equal opportunity to be selected. The sample must appropriately represent its population. Thus, the sample must reflect the population's demographic and other characteristics. Random sampling guarantees population representation. Stratified and cluster sampling could have provided a more accurate population representation. Stratified sampling divides the population into subgroups and randomly selects participants from each segment to ensure equal representation in the sample. Cluster sampling, on the other hand, randomly selects individuals from groups (clusters) with comparable characteristics.

9. TOOL USED

"Digital competence assessment (DCAQ-SSDLK) questionnaire" was developed and standardized by Shipra Srivastav and Kiran Lata Dangwal in 2021 to assess the digital competency (DIGICOM) of teacher educators belonging to higher education in terms of Technological /Operational/Instrumental dimension, Information processing and management dimension, Cognitive/ Pedagogic/ Knowledge Construction dimension and Digital Citizenship dimension. The reliability of the digital competence assessment questionnaire was found to be 0.90, which showed high reliability of the questionnaire.

10. STATISTICAL TECHNIQUES EMPLOYED

This study employed mean, SD, and t-test. Mean is a central tendency measure. This study calculated Teacher educators' digital competence by using mean. The mean score shows the data's central tendency and teacher educators' digital competence. Standard deviation measures data spread. It shows score deviation from the mean. This study examined teacher educators' digital competence scores using standard deviation. A high standard deviation means scores are widely spread from the mean, while a low standard deviation means scores are clustered around the mean. T-tests compare group means. This study compared teacher educators' digital competence by using a t-test. The t-test determines if the two group means differ significantly. The t-test was employed to evaluate and compare the different sample groups of variables. This study employed proper statistical methods to analyse data and answer research questions. Mean and standard deviation gave descriptive statistics on digital competence, while the t-test allowed inferential statistics to assess for significant group differences. These methods showed teacher educators' level of digital competence (DIGICOM).

11. FINDINGS AND INTERPRETATION-

OBJECTIVE-1: To find out the status of the level of digital competence among teacher educators

Table-01

Mean Score of Digital Competence of Teacher Educators

Variable	Sample	Mean	S.D.	Level of Digital Competence
Male	70	35.46	6.42	Intermediate
Female	80	35.84	6.48	Intermediate
Government	60	35.43	6.40	Intermediate
Private	90	35.83	6.40	Intermediate
Science	60	34.96	6.67	Intermediate
Humanities	90	36.95	6.14	Intermediate
Below 10 years	80	35.56	5.83	Intermediate
Above 10 Years	70	35.60	7.10	Intermediate
Digital Competence	150	35.70	6.43	Intermediate

Table 01 showed that the teacher educators had the intermediate level of digital competency irrespective of their gender, type of institutions, teaching stream and teaching experience.

H-1: There is no significant mean difference among teacher educators concerning gender

Table-02

Mean, S.D. and t- Score of Teacher Educators' Digital Competence, Based on Gender.

Gender	Sample	Mean	S.D.	t-value	critical t-value	p-value	Significance Level	Interpretation
Male	70	35.46	6.42	1.65	1.98	0.63	0.05	Not significant t=1.65<1.98, p=0.63>0.05
Female	80	35.84	6.48					

Table 02 showed that the calculated t-value of 1.65 was less than the critical t-value of 1.98 at the level of degree of freedom 148. Also, the p-value 0.63 was greater than the value of significance level 0.05, which clearly indicated that there was no significant mean difference between male and female teacher educators. Thus, the research indicated that there was no gender disparity in the digital competence level of teacher educators.

H-2: There is no significant mean difference among teacher educators concerning with type of institutions

Table-03

Mean, S.D. and t-Score of Teacher Educators' Digital Competence, based on the type of Institution.

Type of Institutions	Sample	Mean	S.D.	t-value	critical t-value	p-value	Significance Level	Interpretation
Government	60	35.43	6.40	1.65	1.98	0.61	0.05	Not significant t=1.65<1.98, p=0.61<0.05
Private	90	35.83	6.40					

Table 03 showed that the calculated t-value of 1.65 was less than the critical t-value of 1.98,at the level of degree of freedom 148. Also, the p-value 0.61 was greater than the value of significance level 0.05, which clearly indicated that there was no significant mean difference between teacher educators who were working in government and private institutions. Thus, the research indicated that there was no disparity found at the type of institutions in digital competence level of teacher educators.

H-3: There is no significant mean difference among teacher educators concerning with teaching stream.

Table-04

Mean, S.D. and t- Score of Teacher Educators' Digital Competence, based on Teaching stream.

Stream	Sample	Mean	S.D.	t-value	critical t-value	p-value	Significance Level	Interpretation
Humanities	90	36.95	6.14	1.65	1.98	0.06	0.05	Not significant t=1.65<1.98, p=0.06>0.05
Science	60	34.96	6.67					

Table 04 showed that the calculated t-value of 1.65 was less than the critical t-value of 1.98, at the level of degree of freedom 148. Also, the p-value 0.06 was greater than the value of significance level 0.05, which clearly indicated that there was no significant mean difference between teacher educators who belonged to humanities and science stream. Hence, no disparity was seen in digital competence level of teacher educators with different teaching streams.

H-4: There is no significant mean difference among teacher educators concerning with years of experience

Table-05

Mean, S.D. and t- Score of Teacher Educators' Digital Competence, based on years of experience.

Teaching Experience	Sample	Mean	S.D.	t-value	critical t-value	p-value	Significance Level	Interpretation
Below 10 years	80	35.56	5.83	1.65	1.98	0.97	0.05	Not Significant t=1.65<1.98, p=0.97> 0.05
Above 10 years	70	35.60	7.10					

Table 05 showed that the calculated t-value of 1.65 was less than the critical t-value of 1.98, at the level of degree of freedom 148. Also, the p-value of 0.97 was greater than the value of significance level 0.05, which clearly indicated that there was no significant mean difference between teacher educators who had below 10 years of teaching experience and above 10 years of teaching experience. Thus, the research indicated that there was no significant impact found among teacher educators with different teaching experiences.

12. CONCLUSION

This study examined the self-perceived level of digital competence of a sample of teacher educators working in the teacher educational institutions of the Kumaun region of Uttarakhand. The findings indicated an intermediate level of digital competence. Furthermore, the study investigated the influence of demographic factors on perceptions of digital competence, revealing no significant disparities based on gender, type of institutions, teaching experience and teaching stream, specifically humanities and science.

The Development of information and communication technology has accelerated the deeper integration of multimedia technology within the education sector, underscoring the need to assess teacher educators' current digital competence levels. This study presents findings that not only reveal teacher educators' digital proficiency but also provide insights into the digital competence of teacher educators across diverse educational systems, enabling future comparative analyses with their counterparts in other countries or educational contexts. The data generated can serve as a valuable reference for educators and academic institutions in developing relevant training and instructional strategies to address identified needs.

CONFLICT OF INTERESTS

None.

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