International Journal of Literacy Theory and Practice
Volume: 3, Issue: 2, 2025 69-88

Digital Literacy Competence among Teachers: Enhancing Teaching and Learning in the 21st-Century

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Abstract

Digital literacy competence of a teacher is currently becoming a prerequisite in successful teaching and learning in the rapidly evolving digitalized world. The paper involves the discussion of how the digital literacy competence of teachers could be used to enhance learning outcomes in classrooms in the 21st century by improving pedagogical practices. The research used a mixed-method design and examined the relationship between teacher digital skills, attitudes towards technologies and technological pedagogical knowledge (TPACK), institutional support, and student engagement. Structured questionnaires and semi-structured interviews were used to sample 300 teachers in the secondary and university levels. Quantitative data were analyzed with descriptive statistics, t-tests, regression, and ANOVA, qualitative data was analyzed with thematic analysis. It was determined that institutional support and continuous professional development are close predictors of the technology integration of the teachers and digitally skilled teachers encourage more learners to be motivated and cooperative particularly in cases where technology is integrated with pedagogical and content knowledge. The paper points out the necessity of setting up sustainable online learning environments within learning institutions. The study concludes that along the technical competency, the development of critical thinking, creative ability, and flexibility to changing technological environments enhance digital literacy of teachers.

Keywords: *Digital literacy, 2 technology integration, pedagogical innovation, TPACK model*

Introduction

The advent of high-tech information and communication technologies (ICTs), although in this article, the term is also used synonymously with the term technical devices, has made the difference between the skills

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required of the learners in the 21st century, in the professional life, citizenship and self-actualization aspects more pronounced than those required of the learners in the 21st century (Tican & Deniz, 2018). According to Madden and Kanos (2020), in a report by Brooking, it is stated that not many Africans are learning skills that they can use in the 21st-century jobs. Thus, in most states, the government and learning establishment are helping modernize the technical gear of schools and create learning resources to instructors at various levels of improvement (Marci-Boehncke & Vogel, 2018).

The African schools face their own problems, and the ongoing COVID-19 pandemic has only revealed them. By March 30, 2020, school closures in over 180 countries have impacted over 87 percent of the total student population of 1.5 billion children and youth (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2020). The UNESCO report also states that most African countries will have more problems with their recovery because of severe economic and technological problems, which is also supported by analogous reports on the continent (Krönke & Olang, 2020; Madden and Kanos, 2020; United Nations, 2019). The COVID-19 pandemic in South Africa was very severe; thus, a series of lockdowns were placed upon the nation that wreaked havoc on the education sector. The periods were characterized by the implementation of rotational attendance, intermittent school shutdowns and days off depending on individual grades with a one-year academic gap (UNICEF, 2021). The report in addition

argues that poverty causes about 750,000 children, particularly those in informal and rural areas to be out of school. Due to the pandemic, there were global recommendations to utilize the distance learning mode and open educational applications to deal with teaching and learning during this period. Despite the enormous inequality issues highlighted by these recommendations that affect the education system in South Africa, they may be the trigger to act (McDonald, 2020).

Digital divides are dynamic and multi-faceted and are gaps in access to ICTs (e.g., personal computers and mobile phones) and intentional use of the same (as evaluated by the outcomes) among individuals, or social or political units (Skaletsky et al., 2017). The age of a person, the educational level, the income level and behaviour are the factors that influence who can access technology, the type of technology that people can access, and who is able to utilize technology (Umugiraneza et al., 2018). Others include policy guidelines, school support, and investment of ICT in the schools (Mustapha et al., 2020). According to Skaletsky et al. (2017), ICT access challenges affect society in question and make them experience

unequal advantages and unequal involvement, which results in social injustice.

ICTs always accompany education in the 21st century, thus, teachers should be conversant with the different pedagogical methods to effectively apply them in facilitating development of their learners 21st century skills (Valtonen et al., 2017). But it cannot happen when teachers have not been properly prepared or helped to assume this role. One of the problems that is not unique to South Africa is the gap between teacher education curriculum, needs and the world of work (Zeichner, 2014). The implication here is that institutions of higher learning will keep on producing graduates with skills that are not applicable to the demands of society, and the government will not see the fruits of their labor and the people at large.

Research in Africa has found out that most of the teachers are deficient in the necessary technological knowledge and require a profound level of professional training to use technology in teaching (Aluko, 2019). It is also quite true in South African context, where the study was done (Torres & Giddie, 2020). Digital literacy is also required to get the relevant ICTs and enhance digital competence, and this concept is commonly interpreted as an inseparable combination of skills without which it is impossible to obtain success in the digital era (List, 2019). The ignorance and incompetence of the teachers in ICT is one of the barriers to effective teaching because teachers are supposed to be familiar with digital media cultures that are important to learners. They too must be capable of applying technology pedagogically in a manner that fits the subject/s being instructed (Amhag et al., 2019; Torres and Giddie, 2020).

The present investigation investigates how far the educators could manage teaching and learning during the COVID-19 pandemic. Our research question was the following: Given the global guideline that suggested the use of the distance learning mode and open educational applications in response to teaching and learning during the COVID-19 pandemic lockdown, how did teachers in our setting manage to proceed with teaching? The focus was on the digital experience of teachers as distance learning students in three geographical locations (rural, semi-urban and urban). The Resources and Appropriation Theory which was used in the study helped the researchers to investigate factors that were not directly related to physical access but influenced the use of technology by educators in teaching (Van Dijk, 2005, 2017).

Significance of Study

The paper is also notable since it will aid in building the additional understanding of the digital literacy competency of educators and its impact on teaching and learning in the 21st century. The study provides a practical idea of the degree of digital capabilities of instructors in that it refers to the level by which technology is being utilized effectively in the classroom to encourage student activities, cooperation, and higher-order thinking.

The findings of the study will be useful to teachers since they can direct their interests to the areas of professional development and education. The study gives evidence-based information to school administrators and policymakers on how to design certain capacity building programs and achieve institutional support as well as allocation of resources to digital infrastructure. It can help to spread the further use of technology-enhanced instruction tools.

Furthermore, the study is applicable to curriculum developers and teacher educators as it brings out the importance of incorporating the digital literacy frameworks in the teacher education systems. The research is relevant to the existing body of literature on digital literacy and educational technology to scholars, in the context of the education system in the current time. Overall, the study would help to improve the level of teaching and equip educators and learners with the tools of meeting the demands of the digitally powered society.

Statement of the Problem

The 21st century has been characterized by high rates of development of digital technologies which have substantially altered the process of teaching and learning. Pedagogies, learning tools, and online platforms based on technology are increasingly becoming dependable on digital platforms, tools, and technology to enhance student engagement, learning, and collaboration. Nevertheless, most of the teachers do not have sufficient digital literacy skills to implement these technologies in their instructional procedures. Such a gap restricts the possible advantages of digital transformation in learning and prevents the acquisition of critical thinking, creativeness, and digital skills by the students.

Although digital resources exist, there are usually problems encountered when using digital resources, including inadequate training, confidence, institutional support, and infrastructure. This leads to the fact that technology is often applied on a simplistic level instead of being exploited as a tool to facilitate higher-order learning and innovative methods of teaching. This issue is also aggravated by the lack of equal opportunities regarding access to professional development and the lack of theoretical

frameworks to measure and improve the digital skills of teachers. When such problems are not solved, the quality of learning and teaching will not be in line with the expectations of the digital world, and the disparity between the curriculum objectives and the classroom activities will expand. Thus, it is urgently required to study the digital literacy competence of teachers, determine the current issues, and suggest ways to enhance their ability to use digital technologies to their advantage. This issue needs to be addressed in the process of enhancing the quality of instruction and meaningful learning experiences in the education of the 21st century.

Research Objectives

1. To determine the extent of digital literacy competence in the secondary and university-level teachers in comparison with the technological, pedagogical, and content knowledge.
2. To determine the most crucial factors that determine digital literacy competence among teachers, such as access to technology, institutional support, and opportunities of professional development.
3. To examine the effects of teachers being digital literate on teaching and learning, as well as their effect on classroom engagement by students, in the 21st century.
4. To investigate the correlation between the attitude of teachers to the integration of technologies and their level of digital literacy.

Research Questions

- How far are secondary and university-level teachers digitally literately competent versus their technological, pedagogical, and content knowledge (TPACK)?
- What do you consider to be the most important influencing elements of digital literacy competence of teachers: namely, access to technologies, institutional support, and career development opportunities?
- What is the impact of the digital literacy level of teachers on teaching and learning outcomes, such as student engagement in the 21st-century classrooms?
- What is the direction of a relation between teacher attitude to technology integration and their level of digital literacy competence?

Research Methodology

Research Design

The study has been based on the research design of mixed methods, combining the two research techniques (quantitative and qualitative research) to develop a comprehensive view of the digital literacy competence of teachers and its effectiveness in teaching. The quantitative part employed an approach of descriptive correlational design that helped the researcher to investigate the connections between variables, including digital literacy, institutional support, technology-related attitudes, and instructional effectiveness. The qualitative element involved the use of semi-structured interviews to understand what teachers have experienced, perceived, and how they have struggled with integrating technology. It adopted a convergent parallel strategy (Creswell and Plano Clark, 2021), in which quantitative and qualitative data were collected in parallel and were analyzed independently, which was followed by a merging of both types of data during interpretation. Triangulation of findings was possible in this design, which increased validity and reliability of results.

Population

The study population was a group of teachers in Punjab, Pakistan in Secondary schools and Universities (both private and government schools). This population was selected due to the growing need of digital pedagogy in each of the levels of education.

Sample and Sampling Technique

The sample of 300 teachers was chosen as the participants of the quantitative part of the study based on the stratified random sampling method that guaranteed the representation of teachers of all genders, types of institutions, and experience.

To conduct the qualitative phase, 15 teachers (10 secondary and 5 university instructors) were chosen purposely to give detailed information on their digital literacy practices, issues, and experiences of professions development. Two methods of sampling were used:

- Stratified Random Sampling (Quantitative phase): There were several stratification criteria used to divide the teachers into a stratum: education level (secondary/university) and sector (public/private). The sampling was done randomly, given the stratum to have a balanced representation.
- Purposive Sampling (Qualitative phase): The participants were selected according to their willingness and experience of teaching

digitally, keeping in mind that the cases that were rich in information were to be interviewed.

Data Collection Instruments

a. Quantitative Measurement Digital Literacy Competence Questionnaire (DLCQ)

The researcher drafted a questionnaire that was structured to have five sections that matched the key variables:

1. Online tools (5 items) Availability.
2. Teaching efficiency (10 items)
3. Teacher attitude to technology (5 items)
4. Proficiency in digital literacy (10items)
5. The support of the institutions (5 items)

All items were assessed using a five-point Likert scale, i.e., 1 (Strongly Disagree), 2 (Strongly Disagree), 3 (Strongly Disagree), 4 (Strongly Disagree), 5 (Strongly Agree). Content validity of the instrument was established by three educational technology experts, and Cronbach alpha (0.89) was used to confirm its reliability.

The interviews were conducted to investigate the experiences of the teachers in terms of implementing technology in their teaching process, professional growth, obstacles, and recommendations to enhance digital competence. The interviews were held online using the Zoom platform and recorded with the consent of participants.

Instrument validity. was achieved by making sure that it was expertly reviewed and tested on 30 teachers.

The construction validity was evaluated using the factor analysis, which ensured that questionnaire items were clustered around the desired variables.

Reliability. The internal consistency was used to attain reliability (Cronbach > 0.80).

Triangulation of the quantitative and qualitative data also helped in enhancing the credibility of the study.

Data Collection Procedure

- The collection of data took two stages. Phase I Distributing the questionnaire the questionnaire was sent electronically to the institutional networks during the fourth week, and the answers were collected via Google Forms. Phase II was the qualitative interview, in which teachers were identified and interviewed in a sample of about 30 minutes or so. All the ethical guidelines were

observed such as informed consent, confidentiality, and voluntary participation.

- SPSS Version 26 was used to conduct the data analysis of the survey data. The demographic data and answers of the participants were described with descriptive statistics (mean, standard deviation, and frequency). Hypotheses and relationships between variables were tested using inferential statistics which consisted of independent t-tests, ANOVA, and regression analysis.
- Independent t-test: To determine the differences in digital literacy of male and female teachers.
- One-way ANOVA: To investigate the differences in teaching experience and the type of institution.
- Regression analysis: To identify predictive relationships between digital literacy, attitudes and teaching effectiveness.
- Pearson correlation: To determine the relationships between the five variables.
- Thematic analysis was used to analyze interview transcripts in accordance with the 6-step model of Braun and Clarke (2021) familiarization, coding, theme identification, review, definition, and reporting. The process discovered some recurrent trends and insights that deserve to supplement quantitative findings. The research was conducted according to the code of ethics of American Educational Research Association (AERA, 2022). All participants were given information concerning the purpose of the study, procedures, and rules on their right to withdraw at any point. Anonymity and data confidentiality was ensured.

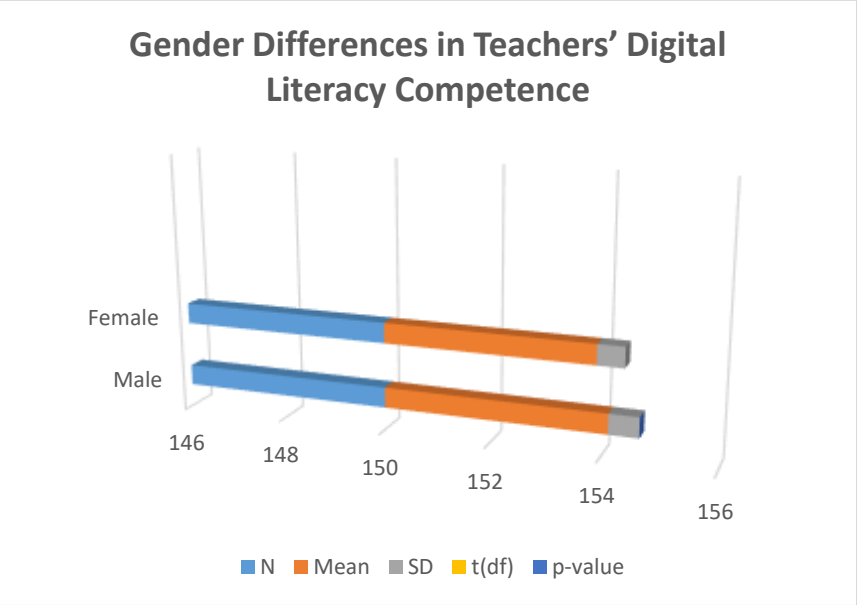
The SPSS (Version 26) was used to analyze the data obtained among the 300 teachers. The analysis covered the research objectives and questions of the study such as the digital literacy competence of the teachers, institutional support, attitude towards technology, access to digital tools, and effectiveness of the teacher.

RESULTS

Table 1
Gender Differences in Teachers' Digital Literacy Competence

Gender	N	Mean	SD	t(df)	p-value
Male	150	4.12	0.54	2.78 (298)	0.006
Female	150	3.89	0.49		

Figure 1
Gender Differences in Teachers' Digital Literacy Competence

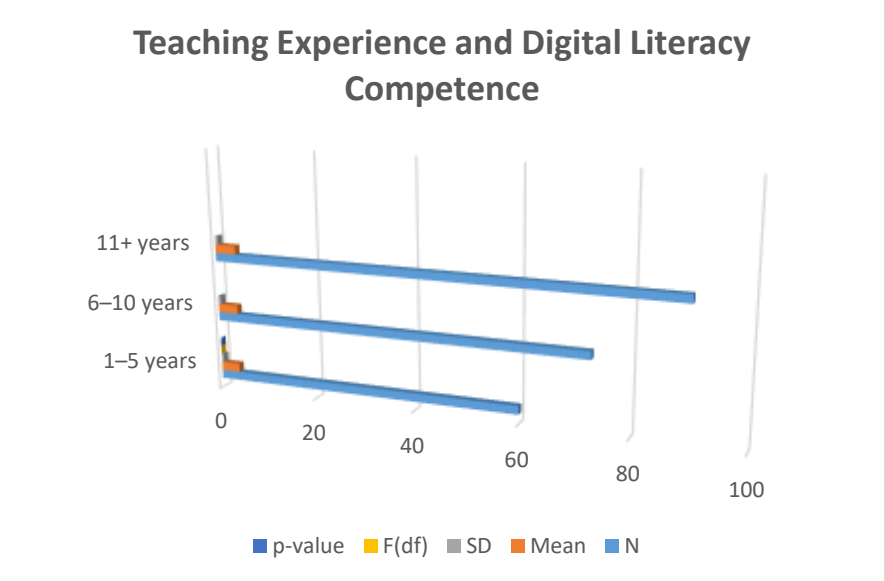


The t-test revealed a significant difference ($p = 0.006 < 0.05$) between male and female teachers in their digital literacy competence. Male teachers reported slightly higher competence levels, possibly due to more frequent technology exposure or training opportunities. The effect size (Cohen's $d = 0.43$) indicates a moderate difference.

Table 2
Teaching Experience and Digital Literacy Competence

Teaching Experience	N	Mean	SD	F(df)	p-value
1–5 years	80	3.72	0.42	4.69 (2, 297)	0.010
6–10 years	110	3.95	0.50		
11+ years	110	4.15	0.58		

Figure 2
Teaching Experience and Digital Literacy Competence

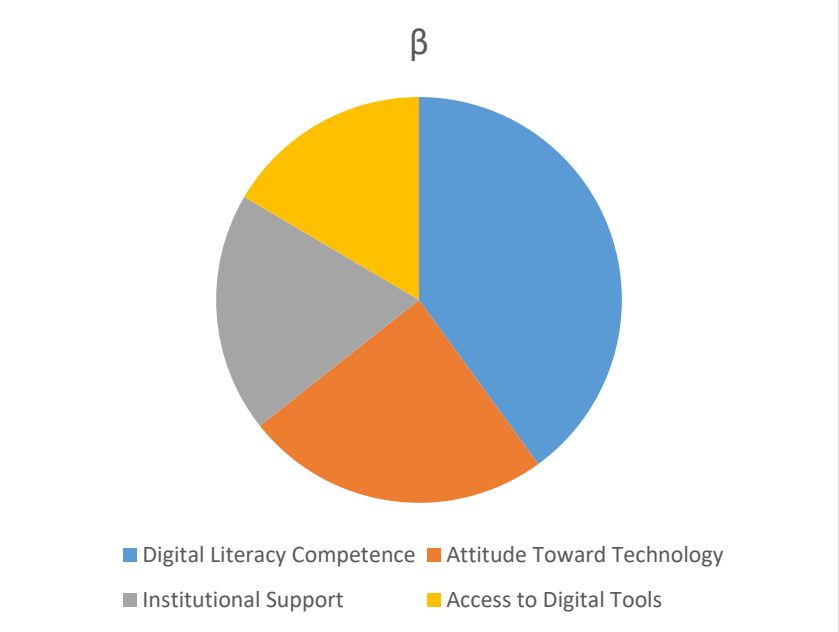


ANOVA indicated a significant difference ($p = 0.010$) in digital literacy competence across teaching experience levels. Post-hoc Tukey tests showed that teachers with over 11 years of experience scored higher than those with less than 5 years. This suggests that teaching experience contributes positively to digital literacy development.

Table 3
Predicting Teaching Effectiveness

Predictor Variable	β	t	p-value	R^2	F(df)
Digital Literacy Competence	0.46	5.98	0.000	0.37	22.41
Attitude Toward Technology	0.28	3.77	0.001		
Institutional Support	0.22	3.12	0.002		
Access to Digital Tools	0.19	2.94	0.004		

Figure3
Predicting Teaching Effectiveness



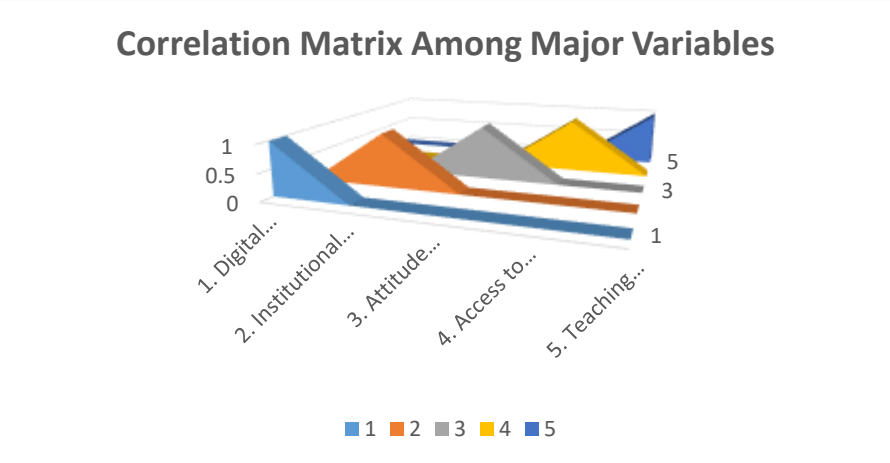
Regression analysis demonstrated that digital literacy competence was the strongest predictor of teaching effectiveness ($\beta = 0.46$, $p < 0.001$). The model explained 37% of the variance ($R^2 = 0.37$), suggesting that

digital skills, institutional support, and positive attitudes significantly enhance teaching outcomes.

Table 4
Correlation Matrix Among Major Variables

Variables	1	2	3	4	5
Digital Literacy Competence	1	.61	.55	.47	.66
Institutional Support		1	.52	.43	.58
Attitude Toward Technology			1	.44	.50
Access to Digital Tools				1	.46
Teaching Effectiveness					1

Figure 4
Correlation Matrix



$p < 0.01$

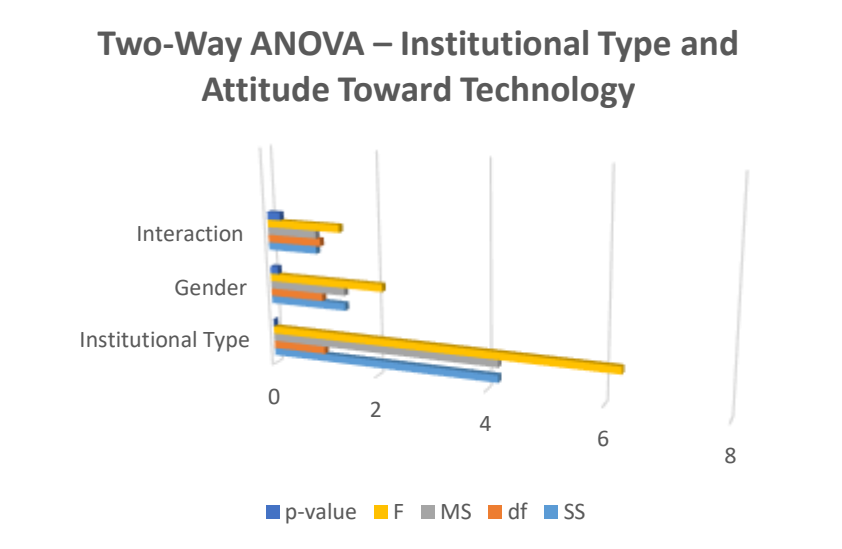
All variables showed strong positive correlations. Digital literacy competence had the highest correlation with teaching effectiveness ($r = .66$, $p < 0.01$), followed by institutional support ($r = .58$). This confirms

that teachers with greater digital literacy and institutional backing exhibit higher teaching effectiveness.

Table 5
Institutional Type and Attitude Toward Technology

Source	SS	df	MS	F	p-value
Institutional Type	4.21	1	4.21	6.28	0.013
Gender	1.43	1	1.43	2.14	0.144
Interaction	0.92	1	0.92	1.37	0.242

Figure 5
Institutional Type and Attitude Toward Technology



The two-way ANOVA revealed a significant main effect of institutional type ($p = 0.013$) on attitudes toward technology, indicating that teachers in private institutions had more favorable attitudes than those in public schools. However, there were no significant gender or interaction effects.

Findings and Discussion

This essay has analyzed the digital literacy capability of teachers and how it has contributed to the success of the teaching and learning in the 21st century classrooms. Mixed-method design gave a chance to do comprehensive research on the correlation between digital skills,

technological attitudes, institutional support, digital tools access, and teaching performance with the aim of influencing the pedagogical outcomes.

Overall, the study findings suggest that more digitally literate educators possess more creative teaching models, learner-centered learning, and adapt relatively more quickly to the evolving digital realities. One may argue that such outcomes may be justified by the recent literature that implies digital literacy skills as an important element of professional-teaching competence. The digital literacy competence of the teachers was found to be rather high, and it was found that the gaps between the genders and experience levels were significant. Male teachers and those with a longer experience of over 10 years reported higher rates of digital proficiency perhaps due to being still exposed to a digital tool and due to the trainings that the institutions gave them.

This finding supports Zhao et al. (2023) identified that long-term teaching experience will result in the development of the capacity of the teachers to successfully incorporate the use of technology. The decreasing gender gap is, however, an indicator of positive trends in accordance with the equitable access and utilization of technology.

Regression analysis has shown that the attitudes of teachers played a significant role in predicting the teaching effectiveness (0.28, $p < 0.01$). Educators with positive attitudes towards technology already had better opportunities to use new approaches to teaching and involve the learners. It follows Ghavifekr and Rosdy (2022) who have indicated that attitude is an intermediate variable between digital competence and teaching innovation. Teachers who perceive technology as a facilitator of pedagogy rather than a challenge will grow and come up with more interactive learning.

Institutional support was found to be significant in digital competence and attitudes of teachers. Competency was better since the privately owned institutions had better technological infrastructures and training opportunities. Evidence of this fact is also provided by research papers by Lee and Jung (2023) and Sultana (2022) to state that with adequate institutional support in terms of professional development, device access, and policy support, educators can become more competent in their use in the classroom. Digital literacy and teaching efficacy had a direct positive relationship with access to good digital resources ($r = 0.46$, $p < 0.01$). Teachers who frequently used the digital media to plan, deliver, and evaluate learners portrayed effective lesson plans. This point of observation can be likened to Rahman et al. (2024) who have also emphasized that 21st century education is built upon digital access as the

basis. This denial limits the innovation of the teachers, student participation and education.

Conclusion

The paper summarizes the digital literacy competency of the teachers as the pillar of successful teaching and learning in the 21st century. The teaching performance, student engagement and capability to be innovative is better among teachers who are well equipped with the capability of realizing superiority in the teaching tasks, which is assisted by the institutions that focus on lifelong learning.

The findings indicate that digital literacy is multidimensional because it suggests technical awareness, pedagogical assimilation, and critical digital awareness. Systems, including policies and continuous teacher training, should support the changes which could be sustained.

Therefore, teacher empowerment in digital literacy should not be seen as a luxury but a learning requirement that should be facilitated to grow and work towards achieving national development, innovations, and equity in learning.

Recommendations

Teachers' ought to be frequently trained in the new digital tools to enhance teaching and learning techniques and keep abreast with changes in technology.

- Lesson planning should incorporate digital tools that are meaningful and that are used to facilitate interactive, student-based and inquiry-based learning.
- To facilitate effective technology-enhanced teaching, schools must have good internet connectivity, computerized resources and technical support.
- Pedagogical Advocacy of Ethical and Responsible Digital Use Educators should be role models and teach responsible digital resource use, such as online safety, data privacy, and academic integrity.
- Digital collaboration, knowledge, and professional learning communities can be used by teachers to increase the efficiency of teaching.

References

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications. https://fhsu.pressbooks.pub

Haugen, A. L. H., Riiser, K., Esser-Noethlichs, M., & Hatlevik, O. E. (2022). Developing indicators to measure critical health literacy in the context of Norwegian lower secondary schools. *International Journal of Environmental Research and Public Health, 19*(5), 3116. https://doi.org/10.3390/ijerph19053116

Iliyasu, R., & Etikan, I. (2021). Comparison of quota sampling and stratified random sampling. *Biometrics & Biostatistics International Journal, 10*(1), 24–27. https://doi. org/ 10. 15406/ bbij.2021.10.00326

Krönke, M., & Olan'g, L. (2020). *Democratic dividend: The road to quality education in Africa* (Afrobarometer Policy Paper No. 63). Afrobarometer. https:// policycommons. net/ artifacts/ 1450624/ democratic-dividend/2082423/

List, A. (2019). Defining digital literacy development: An examination of preservice teachers' beliefs. *Computers & Education, 138*, 146–158. https://doi.org/10.1016/j.compedu.2019.03.009

Madden, P., & Kanos, D. (2020, July 22). Figures of the week: Digital skills and the future of work in Africa. *Brookings Institution*. https://www.brookings.edu/blog/africa-in-focus/2020/07/22/figures-of-the-week-digital-skills-and-the-future-of-work-in-africa/

Marci-Boehncke, G., & Vogel, T. (2018). Digital literacy and inclusion: The impact of theory and practice in teachers' education. In L. Gómez Chova, A. López Martínez, & I. Candel Torres (Eds.), *INTED 2018 Conference Proceedings* (pp. 6872–6879). IATED Academy. https://doi.org/10.21125/inted.2018.1618

McDonald, Z. (2020, May 21). COVID-19 exposes the underbelly of South Africa's education system. *The Conversation*. https://theconversation.com

Mustapha, A., Mohammed, A., Egigogo, A. R., Kutiriko, A. A., & Dokoro, A. H. (2020). Factors affecting the utilization and adoption of technology in education. In A. Mustapha (Ed.), *The role of technology in education*. IntechOpen. https:// doi. org/ 10.5772/intechopen.85712

Skaletsky, M., Pick, J. B., Sarkar, A., & Yates, D. J. (2017). Digital divides: Past, present, and future. In R. D. Galliers & M. K. Stein

(Eds.), *The Routledge companion to management information systems* (pp. 416–443). Routledge. https://doi.org/ 10.4324/ 9781315619361-31

Tican, C., & Deniz, S. (2018). Pre-service teachers' opinions about the use of 21st century learners and 21st century teacher skills. *European Journal of Educational Research, 8*(1), 181–197. https:// doi.org/ 10.12973/eu-jer.8.1.181

Torres, K. M., & Giddie, L. (2020). Educator perceptions and use of technology in South African schools. *Peabody Journal of Education, 95*(2), 117–126. https://doi.org/ 10.1080/ 0161956X.2020.1745611

Umugiraneza, O., Bansilal, S., & North, D. (2018). Exploring teachers' use of technology in teaching and learning mathematics in KwaZulu-Natal schools. *Pythagoras, 39*(1), Article 342. https://doi.org/10.4102/pythagoras.v39i1.342

Valtonen, T., Sointu, E. T., Kukkonen, J., Häkkinen, P., Järvelä, S., Ahonen, A., Näykki, P., Pöysä-Tarhonen, J., & Mäkitalo-Siegl, K. (2017). Insights into Finnish first-year pre-service teachers' perceptions of their 21st century skills. *Education and Information Technologies, 22*(5), 2055–2069. https://doi.org/10.1007/s10639-016-9529-2

Van Dijk, J. A. G. M. (2005). *The deepening divide: Inequality in the information society*. SAGE Publications.

Van Dijk, J. A. G. M. (2017). Digital divide: Impact of access. In P. Rössler, C. A. Hoffner, & L. van Zoonen (Eds.), *The international encyclopedia of media effects* (pp. 1–11). Wiley. https://doi.org/10.1002/9781118783764.wbieme0043

Zeichner, K. (2014). The struggle for the soul of teaching and teacher education in the USA. *Journal of Education for Teaching, 40*(5), 551–568. https://doi.org/10.1080/02607476.2014.956544

Appendix-A

Questionnaire

(Please indicate by a tick ✓ or by filling the blanks)

Gender: ☐ Male ☐ Female ☐ Other

Age: ☐ 20–29 ☐ 30–39 ☐ 40–49 ☐ 50+

Level of Teaching: ☐ Secondary ☐ University.

Years of Teaching Experience: ☐ 111–5 ☐ 6110 11115 1116+

Subject Area: _____

Type of Institution: ☐ Public ☐ private.

Description: A learner must exhibit digital literacy skills in order to manage and utilize computer-based technologies effectively (DLC, 2012).<|human|>Area of Competence:

Digital Literacy.

1. (Determining the capability of the teachers to make good use of digital tools and digital platforms.)
2. I will be able to use digital tools (i.e., Word, Excel, PowerPoint) that will be effective in preparing lessons.
3. I am also sure about the application of learning management systems (e.g., Google Classroom, Moodle).
4. I can judge the credibility and reliability of the online sources.
5. I can also utilize online collaboration resources (e.g. Google Docs, Zoom, Microsoft Teams).
6. I also frequently rely on digital communication tools to communicate with students and colleagues.
7. I can solve some technical issues of basic level that occur in digital instruction.
8. I also use multimedia materials (videos, simulations, animations) in my lessons.
9. I am informed about the latest digital tools and educational technologies.

Section A: Technological, Pedagogical and Content Knowledge (TPACK).

1. (Exploring teacher-adopted technology in instruction and curriculum.)
2. I will be able to develop lessons that incorporate technology in a manner that gets subject content.

3. I know the way technology can improve the level of knowledge of students about certain concepts.
4. I choose technological tools, which correspond to my teaching goals
5. My teaching approaches are adjusted to the context of online learning and blended learning.
6. The digital platform will enable me to evaluate the learning process of students.
7. I ill be able to instruct students on how to use technology ethically and responsibly
8. My instructional choices depend on the technology that is available in my school/university

Question B: Consent and Institutional Support.

1. (Analyzing the support system that increases the level of digital literacy among teachers.)
2. Computers and access to internet is adequately available in my institution.
3. I am also accorded sufficient administrative and technical support in integration of technology.
4. My institution conducts digital literacy workshops and training.
5. The programs of professional development have enhanced my digital teaching
6. I can exchange digital teaching practices with my colleagues.
7. The school/university also promotes innovation by using technology in the classrooms.
8. The policies set by the institutions encourage the use of digital tools in instruction and learning.

Section C: Perceptions of Technology Integration and Implication in Teaching.

1. (Measuring teacher perceptions, attitudes and seen effect on students.)
2. In my opinion, teachers need to be digital literate in the 21st century
3. Incorporation of technology is making learning interesting as well as efficient
4. The use of digital tools makes students more engaged in the classroom.
5. I will not hesitate to try out new learning technologies.

6. In my opinion, the integration of technology enhances the critical thinking and creative ability of students
7. My nature towards technology is a great factor in my teaching effectiveness.
8. I will take an initiative to further enhance my digital competencies to aid in enhancing the quality of teaching.

Section D: Open-Ended Questions.

1. (For qualitative insights.)
2. What are some of the challenges associated with the integration of digital tools in your teaching practice?
3. What do you feel is the best support or training that would improve your digital literacy competence?

What do you think is the impact of digital literacy on the learning outcomes of students?

Citation of this Article:
Akhtar, N., Asadullah., & Elahi, A. (2025). Digital Literacy Competence among Teachers: Enhancing Teaching and Learning in the 21st-Century. *International Journal of Literacy Theory and Practice, 3*(2), 69-88.