Impact of ICT Training Programs on Teacher's Digital Competence at Secondary Schools of District Shaheed Benazir Abad: Pre-Post Study

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The rapid adoption of technology in the education system has indicated the need of teachers to develop effective digital skills. This is a pre- post study that seeks to determine the impact of an ICT training program on the digital competence of secondary-school teachers in District Shaheed Benazir Abad. One hundred and twenty teachers took part and the standardized Digital Competency Assessment Scale (DCAS) was used to evaluate their competencies before and after the training. Data were presented using descriptive statistics and paired samples t-tests in order to determine the significance of the observed improvements. The outcome indicated that there is a statistically significant improvement in general digital competence after training. Significant improvements were found in the areas of digital content production, online work teams and the use of instructional technology. These results make it possible to think that well-organized, practical ICT training programs showed the possibility to increase the digital competency of teachers and feel more confident and effective in integrating technology into the classroom. The research suggests life-long learning, mentoring after training, and increased access to online resources to maintain and further improve the digital skills of the teachers.

1. Introduction

Digital technologies have tremendously grown to change the educational environments in all parts of the world making digital capability a major prerequisite to effective teaching and learning. Modern educational settings have been dubbing that teacher is supposed to use information and communication technologies (ICT) in various aspects of their professional activity like in-instructional design, assessment, collaboration, and classroom management. Digital competence is a complex of knowledge and skills, including the technical one, necessary to use the digital tools, as well as the pedagogical knowledge and attitudes that enable the educational work with technology to be of importance (Karimi and Khawaja, 2024). Studies always find the preparedness of teachers in ICT to be a key predictor of instructional quality and learning among students especially in those settings where instruction using technology is a priority (Iqbal et al., 2024; Quan and Baharom, 2025). Educational programs and policies around the globe are starting to incorporate more and more the digital competence as one of the key professional standards of teachers. As an illustration, systematic reviews point out that digital competence should be conceptualized as a multidimensional concept, which incorporates cognitive, pedagogical, and technical aspects that would support innovative teaching practices (Karimi & Khawaja, 2024; Ahmad et al., 2023). Although there is a general agreement on the necessity of digital competence, empirical data show that a large number of teachers can get into the profession without the required level of ICT skills and that there is a lack of structured opportunities to develop professionally (Rakisheva & Witt, 2023; Imran, & Akhtar, 2023). Such a disconnect is especially pertinent in high school institutions, where educators are dealing with intricate curriculum requirements and the pressure to use digital technologies to support student interaction and segregated instruction.

ICT training interventions are said to be an important tool that can help to raise the digital competence of teachers, with professional development programs being broadly seen as a key way to achieve this goal. These programmes are designed to equip teachers with practical experience, teaching techniques, and contextualized possibilities to utilize digital applications in education and learning (International Journal of Literacy and Education, 2024; Muznah, Gulab, & Ahmad, 2025). The changes to digital literacy-based basic to more advanced competencies (digital content creation, online collaboration, and use of instructional technology use) can be achieved through effective training in digital literacy. The level of ICT training programmes and the statistical significance effects they yield on the digital competence of the teachers, however, are a subject of ongoing research. Recent overviews indicate that despite the fact that training interventions can enhance some digital skills, the outcomes differ across the board depending on the program design, timeline and engagement (SpringerLink, 2025; Ahmad et al., 2024). Empirical research also emphasizes the need to achieve competence change measurement using stringent research designs. The advantages of pre- post intervention studies allow the work of educators and researchers to see the effect of structured training in ICT, through comparison of levels of ICT competence levels before and after. Precisely, these designs prove useful in measuring the competence improvement not only in general terms but also in particular dimensions, in which a teacher can make or miss progress (Pirzada et al., 2024). Although the importance of pre-post designs is acknowledged,

little research has been conducted in the domain of secondary-school environments and has empirically measured the gains in the digital competence of teachers after engaging in the ICT training programmes. The majority of the available research concentrates on university faculty or gives more general reports on the levels of competence and does not directly measure training impacts.

Within the framework of the educational system of Pakistan, secondary school educators are pressured further to incorporate ICT in their instructions as curricula and assessment courses become more digitalized. Nevertheless, inadequate resources and unstable opportunities to undergo the professional development greatly curtail effective integration of technology. Research into the impact of ICT training on digital competence amongst teachers in this context can offer vital policy and practice implications, especially with the world drawing focus on the need to be digitally literate and in the 21st century 1 to be a digitally competent teacher. Also, the knowledge of which particular dimensions of competence respond most to training can be used to inform specific intervention to facilitate maximum instruction (Ali et al., 2023; Imran et al., 2023). This research fills this gap by coming up with examples of the impact of a structured ICT training program on the digital competence of the teachers in the secondary schools of District Shaheed Benazir Abad. The study design applies a quantitative pre- post research design to evaluate the change in general digital competence and important subdomains, such as, digital content creation, online collaboration and use of instructional technology. As the standardized Digital Competence Assessment Scale has been used, the research contributes empirical data regarding the scope and character of competence changes undergoing training participation. The findings not only add to the research findings on teacher digital competence, but also have practical implications on the development of better professional development strategies. By doing it, the study will be based on the prior studies that underline the significance of continuous ICT professional development and deliberate support of curriculum to guarantee that teachers are ready to work under technology-integrated classroom conditions (Rakisheva & Witt, 2023; Ali et al., 2022). Finally, the study will enlighten the educational policy and practice in Pakistan and other similar settings in which digital competence is a core to effective teacher practice, as well as learner learning achievement.

The concept of Information and Communication Technology (ICT) integration into the education process has turned out to be a necessary condition towards improving the educational and learning process in both schools, particularly in the secondary school. However, even with the increased attention of ICT, the use of technology in teaching is still experiencing huge obstacles especially to many teachers especially in developing parts of the world. ICT integration is one of the main challenges faced by Pakistani teachers of secondary schools because of a low level of digital competence and absence of systematic and continuity of the professional development (Almaiah et al., 2021; Al-Emran et al., 2020; Kolachi et al., 2024; Hafeez et al., 2021). Although the widely accepted solution to improve the digital competence of teachers has become ICT training programmes, earlier research has not specifically and exhaustively investigated post and pre-training measures of ICT competencies, particularly digital content creation, online collaboration and instructional technology (Barcelos & Ainsworth, 2020; Oad et al., 2024). Moreover, the digital skills and

their long-term retention along with their potential long-term influence on the teaching operations are not studied sufficiently. The current research looked at how ICT training program is capable of influencing digital competence of teachers in District Shaheed Benazir Abad secondary schools. The study involved comparing pre- and post-training scores on digital competence, which helped measure why the enhancement in the main competencies was conducted in areas like digital content creation, online collaboration and integration of instructional technology. The research given presented interesting facts in relation to the success of ICT training programs and how it could help improve the ICT integration capabilities of teachers in the classroom.

1.1 Research Objectives

- To examine the effect of an ICT training program on teachers' digital competence by comparing pre-training and post-training digital competence scores.

- To determine the level of improvement in specific dimensions of teachers' digital competence particularly digital content creation, online collaboration, and use of instructional technology after participation in the ICT training program.

1.2 Research Questions

- Is there a significant difference between teachers' digital competence scores before and after participation in the ICT training program?

- Which areas of digital competence show improvement after participation in the ICT training program?

2. Literature Review

This literature review aims at investigating the available literature around the issue of effects of ICT training programs on digital competence of teachers. This review attempts to provide a contextual framework explaining how ICT training can increase the digital capabilities of teachers and identify the gaps in the literature the current study aims to fill. Through the critical evaluation of the research undertaken before, this review will provide both a theoretical and empirical basis of understanding the connection between ICT integration, digital competence and instructional effectiveness in secondary education.

2.1 ICT in Education

The importance of ICT in education has been acknowledged in most aspects as an influential tool towards improving the teaching and learning endeavors. ICT has a possibility to change the traditional pedagogical practices and provide new channels of knowledge sharing and interaction with students (Hsu et al., 2020; Akram et al., 2024). Researchers carried out by the OECD (2021) state that successful ICT integration in teaching and learning may lead to a significant increase in student learning outcomes and teacher efficiency. This tendency is becoming increasingly noticeable in the schooling system of all countries of the world, where andragogy finds a person-centered approach, interaction with students enhances their engagement, and teachers have the tools to deliver effective teaching. However, the effectiveness of ICT in learning is highly dependent on the level of digital competence of teachers across different educational conditions and contexts (Avidov-Ungar & Reingold,

2020). There are past studies considering various details of ICT adoption in the school setting, including poor training, absence of infrastructure, and resistance to change as the deterring factors (Almeida, 2021; Ahmad et al., 2024). These issues highlight the key necessity of specific ICT training programmes that could help to improve the digital competence of teachers.

2.2 Teacher's Digital Competence

The concept of digital competence is one of the primary factors that the successful ICT integration in the sphere of education depends on. Digital competence as defined according to the European Union Digital Competence Framework (DigCompEdu, 2020) implies a series of skills, such as the creation of digital content, online communication, and the use of instructional technology by teachers. The abilities will equip the teacher to effectively use ICT tools in the classroom and adopt them in their teaching methods (Vong, 2021). The studies portray that the level of digital competence in teachers impacts their ability to adopt technology in their instructional practices (Zhao & Lai, 2021; Ahmad et al., 2023). The research carried out by Hennessy et al. (2020) highlights the role of ongoing professional growth as the tool that helps teachers to become more knowledgeable about digital skills and, therefore, achieve higher student achievement rates. Teachers who have been provided with digitally competence training are more apt to attending to students through interactive learning, utilize educational technology in a competent manner and give students personalized feedback through a digital platform (Shonfeld et al., 2021).

2.3 ICT Training Programs

The ICT training programmes aim at equipping the teachers with the necessary skills and skills with the required level of digital competence to effectively introduce technology in their classrooms. Internationally, teacher professional development programs that focus on ICT skills have been the most common (Becta, 2020). Several studies have been done to understand the effectiveness of such programmes in terms of duration of trainings, content, and means of delivery. A paper by Sadeghi et al. (2020) explored the effects of ICT training on digital literacy levels in teachers and discovered that formal training programmes featured in an investigative study were markedly successful on the capability of teachers to apply technology in the teaching setting. The use of online platforms and workshops has also been listed as one of the useful training tools which help teachers work actively and collaborate (Jimenez, 2021; Raza & Ahmed, 2017). However, one should understand that the long-term effectiveness of ICT training depends on supporting leadership, teamwork, and access to continuing resources (Carvalho et al., 2021; Akram et al., 2024). Without a proper follow-up and institutional support, teachers might not completely transfer skills that they should focus on during training into their daily teaching routines (Alvarez et al., 2020).

2.4 Impact of ICT on Teaching and Learning

ICT integration will have the potential to affect the quality of teaching and student learning outcomes significantly. Johnson et al. (2020) state that classroom technology can be used to generate more interactive learning experiences, allowing individual form of learning and improving critical thinking and problem-solving abilities of students. Interactive

whiteboards, learning management systems, and digital assessments as an example of ICT tools can provide immediate feedback both to teachers and learners, thus making teaching and learning more dynamic (Dimitriadis et al., 2021; Ali et al., 2023). Besides, studies show that ICT integration promotes collaborative learning conditions, in which students and teachers can exchange sources and engage in online discussions, as well as participate in group activities (Singh et al., 2020). More digitally competent teachers are also able to direct the students in using technology to their advantage to drive up their academic and other learning activities, which subsequently also upscale their performance (Hassan et al., 2021; Ahmad et al., 2023). Nevertheless, research has also pointed at such ICT adoption challenges, as the absence of a particular infrastructure, insufficient training, or technological distraction (Ertmer & Ottenbreitbeit Leftwich, 2020). These obstacles highlight the fact that there is a need to invest in well-organized ICT training programs that will equip the teachers with the skills and confidence to use technology in their teaching in an effective manner.

Despite comprehensive studies being conducted on the integration of ICT in education, there are still gaps in the literature regarding the potential long-term outcomes of the ICT training programs on the digital skills of teachers and their teaching practices (Hennessy et al., 2020). The majority of the studies focus on the immediate effect of ICT training, but little is asked on the effects of such programs on the student outcomes and teaching quality in the long run. Moreover, numerous studies are conducted on the overall ICT adoption, whereas few context-specific studies are conducted to determine the performance of ICT training program in secondary schools especially in developing countries. The current investigation is expected to address this gap by investigating how an ICT training program can influence the level of digital competence of teachers in the digital society at the state level in secondary schools in Shaheed Benazirabad. This research is aimed at giving an insight on the effectiveness of ICT training programs in enhancing the ability of teachers to incorporate digital tools to their teaching practices and the impact of the same on the quality of teaching and learning.

2.5 Theoretical Framework

The theoretical background of this research is based on two major models, which include the Digital Competence Framework on Educators (DigCompEdu) and the Technological Pedagogical Content Knowledge (TPACK) model.

The DigCompEdu framework that was introduced by the European Commission by the authority provides a systematic approach to the understanding of digital competence among educators. It highlights the fact that digital competence is a combination of several interconnected skills, such as professional interaction with the digital resources, producing digital content, and implementing technology in the teaching process, learning process, and assessment. This model aids the reviewing of both the competencies of teachers before and after they attend an ICT training program.

In the TPACK framework offered by Mishra and Koehler, it is argued that the efficient teaching with technology requires the combination of content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK). It holds that these areas should overlap in order to have technology being applied well in the classroom. TPACK

plays a central role in clarifying the effects of ICT training on pedagogical and technical skills, thus empowering the teacher and allowing him to change his or her approach with the help of appropriate digital tools. Taken together, the frameworks provide a full picture on how the ICT training can influence the digital competence of teachers and their ability to become more effective teachers.

2.6 Research Hypotheses

- *H_{01}: There is no significant difference between teachers' pre-training and post-training digital competence scores.*

- *H_{02}: There is no significant improvement in teachers' digital content creation, online collaboration, and use of instructional technology after participation in the ICT training program.*

3. Research Method

This study has chosen to follow the quantitative research approach that is defined by methodical gathering and analysis of numeric information to either prove or disprove theories or answer a research question. This method would be relevant in gauging and assessing the change in digital competence of teachers prior to and after participating in ICT training programs.

3.1 Population of the Study

The study population included all teachers in the public secondary schools that are currently working in District Shaheed Benazir Abad. The rationale of selecting this cohort is that the chosen educators are directly involved in the teaching process and are likely to gain the advantages of ICT training that would improve their digital skills. Since the incorporation of ICT in education is a critical component of modern-day education, there is the need to target the actors that have direct interaction with the students and are charged with the responsibility of providing content in the curriculums.

3.2 Sample Size and Technique

Random sampling was done to get a sample of 120 secondary school teachers. There was the use of random sampling to make sure that all teachers in the population had equal chances of being selected hence reducing selection bias and ensuring that the sample represents the population accurately. The sample was considered to be large enough to offer results, which are meaningful and statistically valid and also satisfy the principle of ensuring that it has enough statistical power to detect significant differences in the results of pre- and post-test.

3.3 Data Collection Tool

The major data gathering tool was the Digital Competency Assessment Scale (DCAS) that was a standardized instrument that was developed to gauge the digital competency of teachers in various aspects. The DCAS assesses numerous aspects of digital competence such as digital content generation, online collaboration and use of instructional technology- aspects that are at the core of the ICT training program objectives. This tool has been identified to be

reliable and valid in the measurement of the digital capabilities of the teachers hence providing a stable and-true measure of their competencies.

3.4 Data Collection Technique

Data were collected in two phases:

1. **Pre-test:** Before the ICT training programme got underway, the teachers were evaluated with the help of the DCAS to make the baseline levels of digital competence. The pre-test scores were used to gain an understanding of the current skills and knowledge of the teachers associated with ICT integration in the education.

2. **Post-Test:** The ICT training program was delivered after which the re-assessment of the digital competence of teachers was administered based on the same DCAS. Subsequent comparison of the post-test scores to pre-test scores was done to find any statistically significant changes that could be attributed to the training.

The methodology of pre-test and after-test is effective in determining the effectiveness of the ICT training program since it allows having a clear comparison of the competencies of the teachers before and after the intervention.

4. Data Analysis Technique

Data obtained during the pre- and post-tests were analyzed with the help of the descriptive statistics and paired-sample t-test. Descriptive statistics including the mean and SD were utilized to make summaries of the central tendency and variability of the scores in both pre-test and post-test to enable the general student performance in the training program. The paired-sample t -test was applied to determine the existence of statistically significant differences between the pre-test and post-test scores. The test will be suitable because it will compare the averages of two sets of associated samples after their comparison to determine whether the ICT training program aroused a significant change in digital competence in teachers.

4.1 Ethical Considerations

Various ethical protection was carefully followed in the course of the study. To begin with, all the subjects were obtained informed consent, and all of them were well aware of the purpose of the study, the methods, and possible risks. The teachers were also assured that they were only involved on a voluntary basis with a chance to quit any time they wanted without the risk of any negative consequences. As a way of maintaining confidentiality and anonymity, the identities of teachers were also not revealed, and all information were properly stored and used solely in the academic context. This was essential towards creating an atmosphere whereby the respondents were at ease in suggesting honest and correct answers in the assessment procedure. There were ethical standards followed in the course of the study that guaranteed the protection of the rights of participants of the research and integrity of the research process.

4.3 Results

Table No 1: Demographic Profile of Participants

Demographic Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	60	50.0
	Female	60	50.0
Age Group (in years)	20-30	30	25.0
	31-40	45	37.5
	41-50	30	25.0
	51 and above	15	12.5
Teaching Experience (years)	1-5	40	33.3
	6-10	35	29.2
	11-15	25	20.8
	16 and above	20	16.7
Educational Qualification	Bachelor's Degree	45	37.5
	Master's Degree	55	45.8
	Other (Diploma, etc.)	20	16.7

Table 1 gives the demographic profile of the research participants, which includes the information about the important characteristics, including gender, age, teaching experience, and educational qualifications. The sample is balanced in the male and female population, as both genders make 50% of the total participants. Such gender equilibrium helps to perform an objective evaluation of the impact of ICT training on digital competence, regardless of gender. Regarding the age distribution, the sample of respondents is predominantly represented by representatives of the 31 to 40-years age group with the 37.5%. Individuals between 20- 30 of age form 25% of the sample population with 25% falling between 41 to 50 of age. Less percentage, 12.5 were 51 years old and above.

As to teaching experience, a substantial number of the participants 33.3%. of them have 1-5 years' experience. The rest (29.28%) have 6-10 years of experience and 20.76% have 11-15 years. Those with over 16 years' experience is only 16.7% in number. The range of experience levels is essential in appreciating the fact that there might be variation in effects of the ICT training depending on tenure. Regarding education level, most of the participants have a Master's Degree (45.8%), then there are those with a Bachelor's Degree (37.5%). A smaller population, 16.7%, has other qualifications including diplomas. The percentage of teachers possessing postgraduate degrees is even greater.

4.4 Results of Hypothesis

Hypothesis 1: There is no significant difference between teachers' pre-training and post-training digital competence scores.

Here, the findings of Hypothesis 1 were presented which tried to study whether there was a strong influence of the ICT training program on the digital competence of the teachers. The paired-sample t test was done to compare the mean digital competence scores prior to and after the ICT training program.
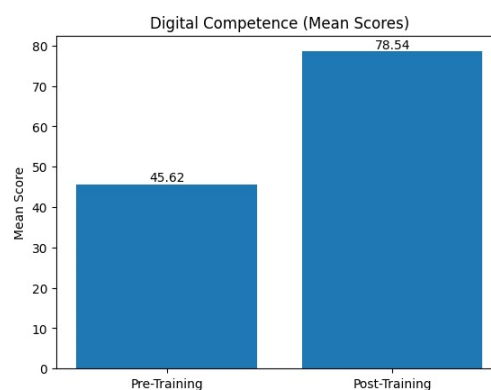
4.5 Descriptive Statistics

The descriptive statistics of the pre-training and post-training score of the digital competence is as follows:

Table No 2: Descriptive Statistics

Measurement	Mean	N	SD	Std. Error Mean
Pre-Training Digital Competence	45.62	120	6.48	0.59
Post-Training Digital Competence	78.54	120	5.92	0.54

Figure No 1: Pre-Training and Post-Training

The table above is describing the average and the standard deviation of the pre-training and post-training digital competence. The mean score of pre-training digital competence was 45.62 (SD = 6.48) and post-training was 78.54 (SD=5.92). The 32.92 point difference between the post-training score and pre-training one indicates the presence of a big difference.

4.6 Paired Sample T-Test Results:

The paired sample t-test was used to assess whether the change in digital competence was statistically significant. The results of the paired sample t-test are as follows:

Table No 3: Paired Sample t test

Paired Differences	Mean	SD	Std. Error Mean	t	df	p
Post-Training – Pre-Training	32.92	7.21	0.66	26.47	119	.000

The t-value (26.47) and the degrees of freedom 119 and the p-value (0.000) show that
As the p-value
at ICT training
rs significantly.

Hypothesis 2: There is no significant improvement in teachers' digital content creation, online collaboration, and use of instructional technology after participation in the ICT training program.

Table No 4: Paired Sample t Test

Dimension	Pre-Training Mean	Post-Training Mean	Mean Difference	T	df	P	Percentage Improvement (%)
Digital Content Creation	14.32	20.19	5.87	18.62	119	.000	41%
Online Collaboration	15.08	20.67	5.59	17.94	119	.000	37%
Use of Instructional Technology	16.22	22.41	6.19	19.38	119	.000	38%

Figure No 2: Pre Vs Post Training
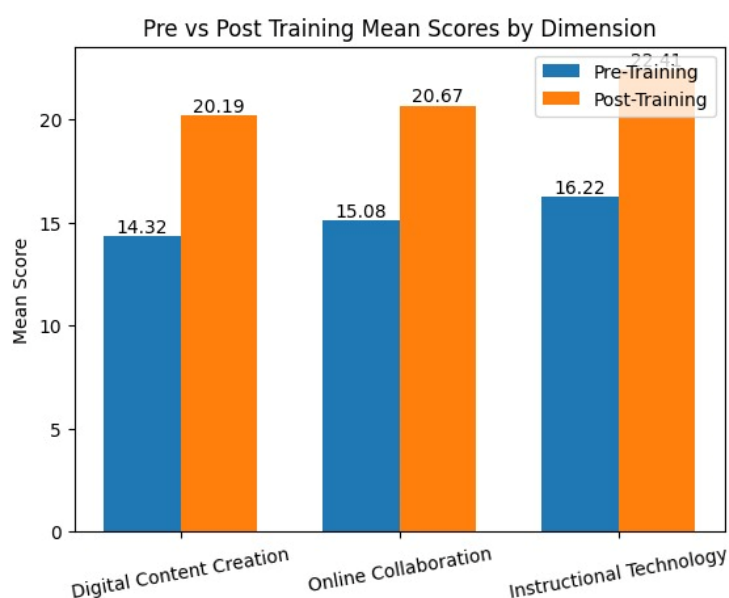
The outcomes of the paired sample t-test demonstrated that the increase in the three dimensions of teacher digital competence had significant results following the ICT training program. As the table above indicates the capacity of teachers in developing digital content enhanced greatly in which the mean score of pre-training teachers with a mean of 14.32 increased to 20.19 with a mean difference of 5.87 after the training. This difference was found to be statistically significant (t = 18.62 p = 0.001) meaning that the training on ICT resulted in significant improvement in the abilities of the teachers to create digital content. The year-over-year increase of the same was 41%.

On the same note, teachers showed a significant improvement on collaboration skills with online applicability. The mean of this dimension was 15.08 before the pre-training and it rose to 20.67 after the post-training and the mean difference was 5.59. The t -test (paired sample) reported the t value of 17.94 (p = 0.001), which once again supports the significance of the change. Online collaboration in terms of improvement was 37%.

Lastly, instructional technology also showed a tremendous growth in its usage. The pre-training mean of teachers was 16.22 and the post-test training mean of 22.41 showed an increase of 6.19 in the mean values. The t-test has produced a t-value of 19.38 (p < 0.001), which meant that the improvement was statistically significant. This dimension portrayed an increment of 38% better. Thus, the results suggest rejection of the hypothesis of the study.

4.7 Discussion

The overarching aim of the study was to assess how ICT training programs affect the digital competence of the teachers taking part in the study i.e. to determine the enhancement in the online collaboration, digital content creation, and use of instructional technology. The results of this paper demonstrate that teacher digital competence significantly increases when they attend the ICT training program, which is a good argument to support the effectiveness of programs aimed at improving teacher digital competence. The paired sample t -test (t = 26.47, p < 0.001) outcome became clear and showed that there was a significant difference in the digital competence scores of the teachers before the training and after the training. In particular, the digital competence of teachers significantly improved based on the mean of 45.62 (SD = 6.48) before the training up to 78.54 (SD = 5.92) after the training, with the difference of 32.92. This is in line with what the past research has indicated, with the transition to the positive role played by ICT training, in enhancing the skills and competence of teachers to use digital tools in teaching (Levy, 2020; Zainuddin et al., 2021; Jabeen, Ali, & Ahmad, 2023). The high rate of digital competence implies that ICT training programs are relevant in terms of bridging the skills gap and empowering teachers to embrace technology in their classrooms, which is in line with the observation of the aforementioned research studies that reveal that professional development initiatives can enhance the level of digital literacy in teachers (Bower et al., 2020; Ali et al., 2023).

The second hypothesis got revolved around the enhancement of certain dimensions of the digital competence of the teachers' digital content creation, online collaboration and instructional technology. These findings reflected that the teachers exhibited a high level of improvement in the three dimensions. The average score of digital content creation rose to 20.19 as opposed to 14.32, which is a strong improvement of 5.87 points (t = 18.62, p < 0.001). This implies that ICT training was very significant in enhancing the capacity of teachers to develop digital content which plays a significant role in successful teaching in the digital era. The increased capacity of teachers to develop digital resources is also needed to develop more interactive and engaging learning environments (Jarvela et al., 2022; Aslam, Iqbal & Ahmed, 2022). The online collaboration skills among the teachers also increased significantly with the mean difference moving between 15.08 to 20.67 (mean difference = 5.59, t = 17.94, p < 0.001). This indicates that ICT training programmes do not only increase technical training, but also promote collaborative practices, which are core in the

contemporary digital learning platforms. It is stressed that research has highlighted the significance of online collaboration in supporting student learning outcomes and contributing to the establishment of professional networks among educators (Ertmer et al., 2021; Thomas, Khan & Ahmad, 2022). The instructional technology had improved the most as the mean score has risen by 6.19 (t = 19.38, p < 0.001) with the mean score at the end of the evaluation being 22.41 (compared with 16.22). This outcome can be considered in line with the previous studies that focus on the importance of instructional technology use in terms of improving the quality of teaching and engagement (Ottenbreit-Leftwich et al., 2020; Khoso, Oad, & Ahmad, 2023). The notable rise in the confidence and competence of the teacher in adapting to technology instructional tools is of much importance especially in the era where learning systems are shifting to more technology integrated learning setups. Altogether, the findings of the given research reveal that ICT training programs may influence the enhancement of the digital competency of teachers in multiple aspects. The findings of enhancement in digital content creation, online collaboration and technology in instruction are also in line with earlier research that identifies a comprehensive professional development program as a necessary measure to enhance technology-related skills of teachers (Fisher & Boulton, 2021; Dilshad et al., 2023).

5. Conclusion

This paper had a purpose of evaluating how ICT training programmes influence the digital competency of teachers especially in digital content creation, online collaboration and use of instructional technology. The findings indicated that the teachers have enhanced their digital skills tremendously upon undergoing the ICT training. This implies that ICT training programmes would be useful in empowering teachers to embrace the use of digital tools in their instructional processes. The results show that specific ICT training programmes might be instrumental in closing the divide in technological skills amongst the teachers that is crucial to the development of the successful technology-based learning conditions. The overall impact of the changes mentioned is that positively in various aspects of digital competence in teachers, most especially teaching aspects that are key in the modern teaching practice. This demonstrates the significance of constant professional growth in the sector of teaching. Since technology in the education sector is developing very fast, it is important that education institutions should be keen to integrate ICT training in their professional development programs. This training would not only provide teachers with the skills they require but it would also enhance their confidence and willingness to use digital tools in their classrooms. In addition, constant encouragement, such as refresher courses and provision of resources, plays a crucial role in sustaining and enhancing digital competencies of teachers. To sum up, this paper has underscored the necessity of ensuring that ICT training programs are holistic and continuous to equip teachers with the necessary skills needed to meet the changing education environment. The future research direction may be to measure the long-term implications of ICT-training on the teaching effectiveness and the impact on student learning outcomes and understand the possibilities of using a combination of various tools of ICT in classroom.

5.1 Recommendations

- Carry out on going, practical ICT training on teachers at different levels in order to keep them abreast on new technologies and pedagogical techniques.
- Mentor and make available online communities to assist teachers to be effective in applying new ICT skills in the classroom.
- Incorporate ICT literacy as a central element in the professional development process of teachers; part of the portable induction and continuous training panels.
- Provide investment in requisite ICT equipment like computers, interactive white boards as well as reliable internet to facilitate successful ICT fusion within classrooms.
- Periodic evaluation of the digital skills of the teachers to maintain their successful performance and use ICT effectively in the teaching process.

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