

A Study on the Effect of Digital Literacy among Teachers Teaching Competence

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Abstract

Digital literacy has become an essential competency for teachers in the 21st-century educational environment due to the rapid advancement of technology and the increased integration of Information and Communication Technology (ICT) in teaching and learning processes. The present study aimed to examine the effect of digital literacy on the teaching competence of secondary school teachers. The study was conducted on a sample of 150 secondary school teachers selected through the stratified random sampling technique from Guntur district of Andhra Pradesh. A descriptive survey method was employed for the study, and data were collected using two self-constructed tools namely the Digital Literacy Scale and the Teaching Competence Scale. Statistical techniques such as mean, standard deviation, t-test, and Pearson's correlation were used for data analysis.

The findings of the study revealed significant differences in digital literacy and teaching competence among secondary school teachers with respect to gender and locality. Female teachers demonstrated higher levels of digital literacy and teaching competence compared to male teachers, while urban teachers showed higher scores than rural teachers. The study also found a strong positive and significant relationship between digital literacy and teaching competence, indicating that teachers with higher digital literacy possess better instructional effectiveness and professional competence. The findings highlight the importance of strengthening digital literacy among teachers through technology-oriented training programs and professional development initiatives. The study emphasizes the need for educational institutions and policymakers to provide adequate digital infrastructure and support systems to enhance teaching competence and improve the quality of education in the digital era.

Keywords: NEP 2020, Critical Thinking, Multimedia, Digital Literacy, Teaching Competence, Effectiveness, Rural, Urban.

1. Introduction

Education is a powerful instrument for individual growth and national development, as it equips individuals with knowledge, skills, values, and competencies necessary for meaningful participation in society. In the present digital era, the educational system is undergoing rapid transformation due to technological advancements and the increasing integration of Information and Communication Technology (ICT) in teaching and learning processes. As classrooms become more technology-oriented, digital literacy has emerged as an essential skill for teachers to effectively manage and enhance instructional practices. Therefore, understanding the effect of digital literacy on teachers' teaching competence has become highly significant in contemporary education.

Digital literacy refers to the ability to access, understand, evaluate, create, and communicate information using digital technologies effectively and responsibly. Teachers with adequate digital literacy can utilize online platforms, multimedia resources, educational applications, and virtual learning environments to make teaching more interactive, innovative, and learner-centered. Such competencies enable teachers to improve lesson planning, classroom communication, assessment strategies, and student engagement. In this context, digital literacy is closely associated with teaching competence, which includes pedagogical skills, subject mastery, classroom management, instructional effectiveness, and the ability to adapt teaching methods according to learners' needs.

The importance of studying the effect of digital literacy on teaching competence is further emphasized by the objectives of the National Education Policy (NEP) 2020, which advocates the integration of technology in education for improving quality and accessibility. Teachers who possess strong digital skills are better prepared to meet the challenges of modern education and to foster critical thinking, creativity, collaboration, and problem-solving abilities among students. Moreover, digitally competent teachers can create inclusive learning environments and effectively support diverse learners through technology-enabled instruction.

This study aims to examine the effect of digital literacy on the teaching competence of secondary school teachers. The findings of the study are expected to provide valuable insights into the role of digital literacy in enhancing teaching effectiveness and professional competence. The study may also help educational institutions, policymakers, and teacher education programs to design appropriate training initiatives and digital capacity-building programs for teachers. Ultimately, strengthening digital literacy among teachers can contribute to improving the quality of education and preparing learners for the demands of the 21st century.

2. Digital Literacy in Secondary School Teachers

Education plays a significant role in the development of individuals and society by providing knowledge, skills, values, and competencies essential for personal and professional growth. In the modern era, rapid technological advancements have brought remarkable changes in the field of education, making the integration of digital technologies an essential component of the teaching-learning process. With the increasing use of Information and Communication Technology (ICT) in schools, digital literacy has become an important competency for teachers to effectively perform their professional responsibilities. Therefore, studying the effect of digital literacy on teachers' teaching competence has gained considerable importance in contemporary education.

Digital literacy refers to the ability to use digital technologies efficiently for accessing, evaluating, creating, and communicating information. Teachers who possess strong digital literacy skills are better able to integrate technological tools, online resources, multimedia applications, and digital platforms into classroom instruction. Such integration not only improves the quality of teaching but also enhances student participation, collaborative learning, creativity, and critical thinking. In this regard, teaching competence includes various professional abilities such as lesson planning, classroom management, subject expertise, instructional strategies, communication skills, evaluation techniques, and the effective use of innovative teaching methods.

The National Education Policy (NEP) 2020 strongly emphasizes the integration of technology in education to improve the quality, accessibility, and effectiveness of teaching and learning. In this context, teachers with higher levels of digital literacy are more capable of adapting to changing educational needs and

creating learner-centered classrooms. They can effectively use digital tools to provide personalized learning experiences, conduct online assessments, and facilitate interactive learning environments. Thus, digital literacy significantly contributes to enhancing teaching competence among teachers.

The present study focuses on examining the effect of digital literacy on the teaching competence of secondary school teachers. The study seeks to understand how digital literacy influences teachers' professional effectiveness and instructional performance. The findings of the study are expected to provide valuable insights for educational institutions, policymakers, and teacher education programs in developing appropriate digital training and professional development initiatives. Strengthening digital literacy among teachers will ultimately contribute to improving teaching competence and achieving the goals of quality education in the 21st century.

3. Teaching Competence in Secondary School Teachers

Teaching competence is a comprehensive concept that includes the knowledge, skills, attitudes, and professional abilities required for effective teaching and successful classroom management. In the context of the present digital age, teaching competence has become closely associated with the ability of teachers to integrate technology into instructional practices. Teachers who possess adequate teaching competence are capable of planning lessons effectively, delivering content clearly, managing classrooms efficiently, assessing student performance accurately, and adopting innovative teaching methods to enhance learning outcomes. Research studies have highlighted that competent teachers contribute significantly to students' academic achievement and overall development, as they are better equipped to address the diverse learning needs of students and create meaningful learning experiences.

Digital literacy plays an important role in strengthening teaching competence among teachers. Teachers with strong digital literacy skills can effectively use digital tools, online learning platforms, multimedia resources, and educational technologies to make classroom instruction more interactive, engaging, and learner-centered. They can design technology-supported learning activities, facilitate collaborative learning, and provide timely feedback to students through digital means. Moreover, digital literacy enables teachers to access updated educational resources, improve communication, and adopt innovative pedagogical practices that enhance teaching effectiveness. Thus, digital literacy positively influences various dimensions of teaching competence, including instructional planning, classroom interaction, evaluation methods, and professional development.

In addition to pedagogical and technological skills, teaching competence also involves effective communication, classroom management, interpersonal relationships, and the ability to create an inclusive learning environment. Teachers must be capable of motivating students, encouraging participation, and fostering critical thinking and creativity in the classroom. Digitally literate teachers are often better prepared to create collaborative and student-centered learning environments that support both academic and social development. Furthermore, continuous professional development and lifelong learning are essential for teachers to remain effective in the rapidly changing educational environment.

The present study emphasizes the importance of digital literacy in enhancing the teaching competence of secondary school teachers. As educational institutions increasingly integrate technology into teaching and learning processes, teachers must develop the necessary digital skills to meet the demands of 21st-century education. Strengthening digital literacy among teachers can significantly improve their professional competence, instructional effectiveness, and ability to provide quality education in modern classrooms.

4. Relationship Between Digital Literacy and Teaching Competence in Secondary School Teachers

The relationship between digital literacy and teaching competence has become increasingly important in the context of modern education, where technology plays a central role in teaching and learning processes. Digital literacy involves the ability to effectively access, evaluate, manage, and communicate information using digital technologies. Teachers who possess strong digital literacy skills are better prepared to integrate technological tools and digital resources into classroom instruction, thereby enhancing their teaching competence. In today's technology-driven educational environment, digitally literate teachers can create engaging, interactive, and learner-centered classrooms that improve students' learning experiences and academic achievement.

Teaching competence includes a wide range of professional abilities such as lesson planning, instructional delivery, classroom management, communication skills, assessment techniques, and the use of innovative teaching strategies. Teachers with higher levels of digital literacy are more capable of using online platforms, multimedia presentations, educational applications, and virtual learning environments to support effective teaching practices. The integration of digital technologies enables teachers to present content more effectively, encourage student participation, promote collaborative learning, and provide immediate feedback to learners. As a result, digital literacy significantly contributes to improving the overall quality and effectiveness of teaching.

Furthermore, the influence of digital literacy on teaching competence extends beyond technological usage to the development of critical thinking, creativity, and problem-solving abilities among teachers and students alike. Digitally competent teachers can guide students in the responsible and ethical use of technology, promote digital citizenship, and help learners navigate the vast amount of information available in online environments. Such teachers are better equipped to adapt to changing educational demands and support diverse learning needs through technology-enabled instruction.

The National Education Policy (NEP) 2020 strongly advocates the integration of digital technologies in education to improve accessibility, quality, and innovation in teaching practices. In this context, enhancing digital literacy among teachers becomes essential for strengthening their teaching competence and professional effectiveness. The present study focuses on examining the effect of digital literacy on teaching competence among secondary school teachers. The findings of the study are expected to provide valuable insights for educational institutions, policymakers, and teacher education programs in designing effective digital training and professional development initiatives. Strengthening digital literacy among teachers will ultimately contribute to quality education and the successful implementation of technology-integrated teaching practices in the 21st century.

5. Need and Significance of the Study

The need for the present study arises from the rapid advancement of technology and the increasing integration of digital tools in educational practices. In the contemporary educational environment, teachers are expected to effectively utilize Information and Communication Technology (ICT) to enhance classroom instruction and improve learning outcomes. As educational systems continue to adopt technology-based teaching methods, digital literacy has become an essential competency for teachers. Teachers who possess strong digital literacy skills are better equipped to use online platforms, multimedia resources, digital assessment tools, and virtual learning environments in their teaching practices. Therefore, understanding the effect of digital literacy on teaching competence has become highly important in the field of education.

Despite the growing emphasis on technology integration in education, many teachers still face challenges in effectively applying digital tools in classroom instruction. Lack of adequate digital literacy may limit teachers' ability to adopt innovative teaching methods, manage technology-enabled classrooms, and meet the diverse learning needs of students. In this context, studying the relationship between digital literacy and teaching competence can help identify the extent to which digital skills contribute to effective teaching practices. The findings may also reveal areas where teachers require additional digital training and professional support to enhance their instructional competence.

The significance of this study extends beyond individual teacher performance and has broader implications for the educational system as a whole. Teachers with higher levels of digital literacy are more likely to create interactive, learner-centered, and inclusive learning environments that promote student engagement, creativity, collaboration, and critical thinking. Such teachers can effectively guide students in the responsible and ethical use of technology, thereby preparing them for the demands of the digital age. Furthermore, digitally competent teachers play a vital role in achieving the objectives of the National Education Policy (NEP) 2020, which strongly advocates the integration of technology into teaching and learning processes to improve educational quality and accessibility.

This study aims to examine the effect of digital literacy on the teaching competence of secondary school teachers. The findings of the study are expected to provide valuable insights for educational institutions, policymakers, and teacher education programs in designing effective digital literacy training and professional development initiatives for teachers. Strengthening digital literacy among teachers can significantly enhance their teaching competence, improve classroom effectiveness, and contribute to the overall quality of education in the 21st-century learning environment.

6. Literature Review

The review of related literature indicates that digital literacy plays a significant role in enhancing teaching competence among teachers in the modern educational environment. Several researchers emphasized that digital literacy is essential for effective teaching and successful integration of technology into classroom practices. Hague and Payton (2010) highlighted the importance of integrating digital skills into teaching, while Mishra and Koehler (2006, 2009) explained through the TPACK framework that effective teaching competence depends on the integration of technology, pedagogy, and content knowledge.

Studies by Darling-Hammond (2000), Gunter and Gunter (2012), and Sang et al. (2011) revealed that teachers with higher digital literacy are more capable of adopting innovative teaching methods, creating interactive learning environments, and improving student learning outcomes. Similarly, Hsu, Ching, and Grabowski (2016) found that digitally literate teachers positively influence students' use of technology and promote collaborative learning experiences.

Researchers such as Ribble (2015), Zins et al. (2004), and Tondeur et al. (2017) emphasized that digital literacy also contributes to responsible technology use, positive classroom environments, and teachers' confidence toward technology integration. Bennett and Maton (2010), Schmid and Mistral (2018), and Kirkwood and Price (2014) pointed out that many teacher education programs still lack adequate digital literacy training, creating gaps in teachers' preparedness for technology-enabled classrooms.

Further studies by Voogt and Pareja Roblin (2010), Marci-Boehncke and Vogel (2018), Lai and Hwang (2016), and Wei (2022) identified digital literacy as a core competency required for 21st-century teachers. These studies concluded that teachers with strong digital literacy skills are more effective in integrating technology into teaching, enhancing student engagement, and improving teaching competence. Overall,

the reviewed literature strongly supports the view that digital literacy positively influences teaching competence and highlights the need for systematic digital literacy training in teacher education programs.

7. Objectives:

1. To find out the influence of the following variables on the Digital Literacy of Secondary School Teachers i.e.
 - a. Gender: Male/Female
 - b. Locality: Urban/Rural
2. To find out the influence of the following variables on the Teaching Competence of Secondary School Teachers i.e.
 - a. Gender: Male/Female
 - b. Locality: Urban/Rural
3. To find out the relationship between Digital Literacy and Teaching Competence of Secondary School Teachers.

8. Hypotheses:

1. There would be no Significance difference between Male and Female Secondary School Teachers Based on their Digital Literacy.
2. There would be no Significance difference between Urban and Rural Secondary School Teachers Based on their Digital Literacy.
3. There would be no Significance between Male and Female Secondary School Teachers Based on their Teaching Competence.
4. There would be no Significance between Urban and Rural Secondary School Teachers Based on their Teaching Competence.
5. There would be no Significance relationship between Digital Literacy and Teaching Competence of Secondary School Teachers.

9. Methodology

The present study was conducted on a sample of 150 secondary school teachers selected through the stratified random sampling technique from Guntur district of Andhra Pradesh. The study employed the descriptive survey method to collect quantitative data related to digital literacy and teaching competence among teachers. For data collection, two self-constructed tools namely the Digital Literacy Scale and the Teaching Competence Scale were used. These instruments were designed to measure the levels of digital literacy and teaching competence of the participants and to examine the effect of digital literacy on teaching competence among secondary school teachers.

10. Data Analysis

The collected data were analysed using appropriate statistical techniques to examine the effect of digital literacy on teaching competence among secondary school teachers. Statistical methods such as the t-test were employed to identify significant differences in digital literacy and teaching competence with respect to variables like gender (male and female) and locality (urban and rural). In addition, correlation analysis was used to determine the relationship between digital literacy and teaching competence among the teachers. These statistical analyses provided meaningful insights into the factors influencing teachers'

digital literacy and teaching competence levels and helped in understanding the extent to which digital literacy contributes to effective teaching practices.

Objective-1. To find out the influence of the following variables on the Digital Literacy of Secondary School Teachers i.e.

- a. Gender: Male/Female
- b. Locality: Urban/Rural

Hypothesis- 1. There would be no Significance between Male and Female Secondary School Teachers Based on their Digital Literacy.

Table 1. Digital Literacy Scores of Male and Female Secondary School Teachers

Gender	N	Mean	Std. Deviation	SEd	t value	p value
Male	65	198.29	18.63	2.98	4.46*	0.00
Female	85	211.56	17.28			

Note: *Significant at 0.05 level of significance

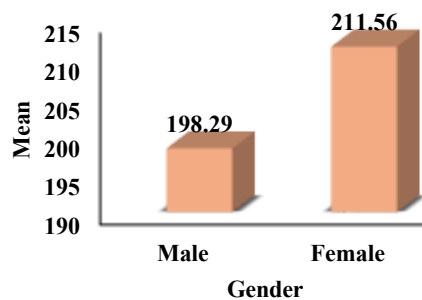


Figure 1. Mean difference between Male and Female Secondary School Teachers Based on their Digital Literacy

Interpretation:

The results of the independent samples t-test revealed that there was a statistically significant difference in digital literacy scores between male teachers ($M = 198.29, SD = 18.63$) and female teachers ($M = 211.56, SD = 17.28$), $t(148) = 4.46, p < .01$. Female secondary school teachers demonstrated significantly higher digital literacy scores than male secondary school teachers.

Hypothesis- 2. There would be no Significance between Urban and Rural Secondary School Teachers Based on their Digital Literacy.

Table 2. Digital Literacy Scores of Urban and Rural Secondary School Teachers

Locality	N	Mean	Std. Deviation	SEd	t value	p value
Urban	73	223.91	10.35	1.56	9.35*	0.00
Rural	77	209.34	8.64			

Note: * Significant at 0.05 level of significance

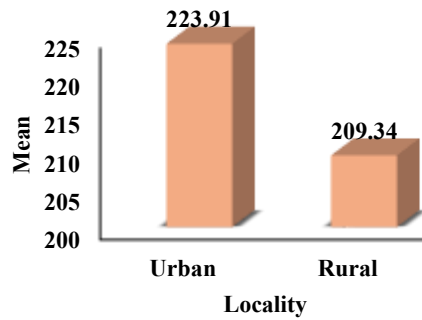


Figure 2. Mean difference between Urban and Rural Secondary School Teachers Based on their Digital Literacy

Interpretation:

The results of the independent samples t-test revealed that there was a statistically significant difference in digital literacy scores between urban teachers ($M = 223.91, SD = 10.35$) and rural teachers ($M = 209.34, SD = 8.64$), $t(148) = 9.35, p < .01$. Urban secondary school teachers demonstrated significantly higher digital literacy scores than rural secondary school teachers.

Objective-2. To find out the influence of the following variables on the Teaching Competence of Secondary School Teachers i.e.

- a. Gender: Male/Female
- b. Locality: Urban/Rural

Hypothesis- 3. There would be no Significance between Male and Female Secondary School Teachers Based on their Teaching Competence.

Table 3. Teaching Competence Scores of Male and Female Secondary School Teachers

Gender	N	Mean	Std. Deviation	SEd	t value	p value
Male	65	202.63	12.23	1.80	2.41	0.017
Female	85	206.97	9.69			

Note: * Significant at 0.05 level of significance

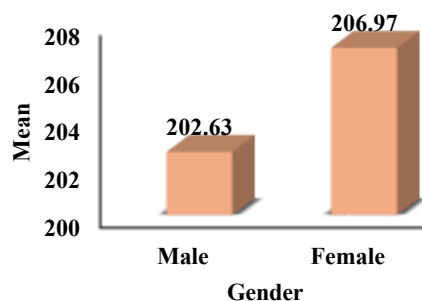


Figure 3 Mean difference between Male and Female Secondary School Teachers Based on their Teaching Competence.

Interpretation:

The results of the independent samples t-test revealed that there was a statistically significant difference in teaching competence scores between male teachers ($M = 202.63, SD = 12.23$) and female teachers (M

= 206.97, $SD = 9.69$, $t(148) = 2.41$, $p < .05$. Female secondary school teachers demonstrated significantly higher teaching competence scores than male secondary school teachers.

Hypothesis- 4. There would be no Significance between Urban and Rural Secondary School Teachers Based on their Teaching Competence.

Table 4. Teaching Competence Scores of Urban and Rural Secondary School Teachers

Locality	N	Mean	Std. Deviation	SEd	t value	p value
Urban	73	215.69	10.06	1.50	6.52	0.00
Rural	77	205.91	08.24			

Note: * Significant at 0.05 level of significance

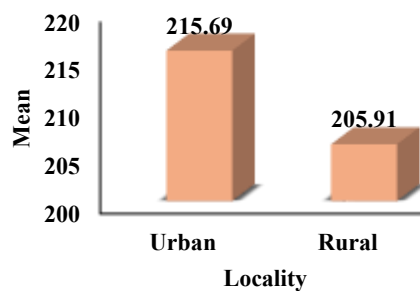


Figure 4 Mean difference between Urban and Rural Secondary School Teachers Based on their Teaching Competence.

Interpretation

The results of the independent samples t-test revealed that there was a statistically significant difference in teaching competence scores between urban teachers ($M = 215.69$, $SD = 10.06$) and rural teachers ($M = 205.91$, $SD = 8.24$), $t(148) = 6.52$, $p < .01$. Urban secondary school teachers demonstrated significantly higher teaching competence scores than rural secondary school teachers.

Hypothesis-5. There would be no Significance relationship between Digital Literacy and Teaching Competence of Secondary School Teachers.

Table 5. Correlation Between Digital Literacy and Teaching Competence Among Secondary School Teachers

		Teaching Competence
Digital Literacy	Pearson Correlation	0.872**
	Sig. (2-tailed)	0.000
	N	150

** . Correlation is significant at the 0.01 level (2-tailed).

Interpretation

The Pearson product-moment correlation analysis revealed a strong positive and statistically significant relationship between digital literacy and teaching competence among secondary school teachers, $r(148) = .872$, $p < .01$. This indicates that higher levels of digital literacy are associated with higher levels of teaching competence among secondary school teachers. Therefore, the null hypothesis stating that there would be no significant relationship between digital literacy and teaching competence was rejected.

11. Major findings of the study

1. A significant difference was found in digital literacy scores between male and female secondary school teachers, with female teachers demonstrating higher digital literacy levels than male teachers.
2. A significant difference was found in digital literacy scores between urban and rural secondary school teachers, with urban teachers showing higher digital literacy levels than rural teachers.
3. A significant difference was found in teaching competence scores between male and female secondary school teachers, with female teachers exhibiting higher teaching competence levels than male teachers.
4. A significant difference was found in teaching competence scores between urban and rural secondary school teachers, with urban teachers demonstrating higher teaching competence levels than rural teachers.
5. A strong positive and significant relationship was found between digital literacy and teaching competence among secondary school teachers, indicating that higher digital literacy contributes to greater teaching competence.

12. Discussion

The findings of the present study revealed a significant difference in digital literacy between male and female secondary school teachers, with female teachers demonstrating higher digital literacy levels than male teachers. This finding indicates that female teachers are actively adapting to technological advancements and effectively utilizing digital tools in educational practices. The result is consistent with the studies conducted by Hague and Payton (2010) and Higgins (2018), who emphasized the importance of digital literacy in modern teaching practices and highlighted the need for teachers to effectively integrate technology into classroom instruction. The finding also supports the views of Sang et al. (2011), who reported that teachers with higher digital literacy are more likely to adopt innovative teaching strategies and improve instructional effectiveness.

The study further found a significant difference between urban and rural secondary school teachers in digital literacy, with urban teachers exhibiting higher levels of digital literacy than rural teachers. This difference may be attributed to better access to technological infrastructure, internet facilities, and digital learning resources available in urban areas. The finding aligns with the observations of Schmid and Mistral (2018) and Kirkwood and Price (2014), who pointed out that insufficient digital training opportunities and lack of technological resources create gaps in teachers' preparedness for digital education, particularly in less developed areas. Similarly, Bennett and Maton (2010) emphasized that many teachers still lack adequate digital skills despite increasing technological demands in education.

The results of the study also revealed a significant difference in teaching competence between male and female secondary school teachers, with female teachers demonstrating higher teaching competence scores. This finding may be due to greater instructional commitment, effective classroom management, and active engagement in professional development activities among female teachers. The finding is supported by Darling-Hammond (2000), who emphasized that competent teachers significantly contribute to student achievement through effective instructional practices. Additionally, Gunter and Gunter (2012) stated that teachers who effectively integrate technology into teaching can create engaging learning environments and improve educational outcomes.

A significant difference was also observed between urban and rural teachers in teaching competence, with urban teachers exhibiting higher teaching competence levels. This may be influenced by greater exposure to technology-enabled teaching methods, professional training opportunities, and access to educational

resources in urban schools. The finding is in agreement with the studies of Voogt and Pareja Roblin (2010) and Lai and Hwang (2016), which highlighted digital literacy as a core competency required for 21st-century teachers and emphasized the importance of integrating digital technologies into pedagogical practices to enhance teaching effectiveness.

The most important finding of the study was the strong positive and significant relationship between digital literacy and teaching competence among secondary school teachers. This indicates that teachers with higher levels of digital literacy tend to demonstrate better teaching competence. The finding strongly supports the TPACK framework proposed by Mishra and Koehler (2006, 2009), which explains that effective teaching depends on the integration of technology, pedagogy, and content knowledge. The result is also consistent with the studies of Tondeur, Ertmer, and Ottenbreit-Leftwich (2017) and Wei (2022), who concluded that digitally literate teachers possess more positive attitudes toward technology integration and are better prepared to meet the challenges of modern education.

Overall, the findings of the present study confirm that digital literacy plays a vital role in enhancing teaching competence among secondary school teachers. The study highlights the need for strengthening digital literacy training and technology integration programs in teacher education and professional development initiatives to improve the quality of teaching and learning in the digital era.

13. Educational Implication:

1. The findings of the study highlight the need for integrating digital literacy training into teacher education and professional development programs to enhance teaching competence among secondary school teachers.
2. Educational institutions should organize regular workshops, training sessions, and ICT-based skill development programs to strengthen teachers' ability to effectively use digital technologies in classroom instruction.
3. The study emphasizes the importance of providing adequate digital infrastructure and technological resources, particularly in rural schools, to reduce disparities in digital literacy and improve teaching effectiveness.
4. Policymakers and educational administrators should develop technology-integrated curriculum frameworks aligned with the objectives of the National Education Policy (NEP) 2020 to promote innovative, learner-centered, and digitally supported teaching practices.

14. Conclusion

The present study examined the effect of digital literacy on the teaching competence of secondary school teachers. The findings revealed that digital literacy plays a significant role in enhancing teaching competence among teachers. Significant differences were observed in digital literacy and teaching competence with respect to gender and locality. Female teachers demonstrated higher levels of digital literacy and teaching competence compared to male teachers, while urban teachers showed greater digital literacy and teaching competence than rural teachers. The study also identified a strong positive relationship between digital literacy and teaching competence, indicating that teachers with higher digital literacy skills are more effective in instructional practices, classroom management, and the integration of technology into teaching and learning processes.

The study highlights the growing importance of digital literacy in the modern educational system, especially in the context of the National Education Policy (NEP) 2020, which emphasizes technology

integration in education. The findings suggest that improving teachers' digital literacy through training programs, workshops, and technology-based professional development initiatives can significantly enhance their teaching competence and overall instructional effectiveness. Furthermore, the study emphasizes the need to provide adequate technological infrastructure and equal digital learning opportunities, particularly for rural teachers, to bridge the digital divide and improve the quality of education. Therefore, strengthening digital literacy among teachers is essential for promoting innovative, learner-centered, and effective teaching practices in 21st-century classrooms.

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