Empowering Primary School Teachers: Strategies for Enhancing Informatization Teaching Skills

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Abstract

This study analyzes the information-based teaching abilities of primary school teachers in mathematics and English subjects, focusing on the factors influencing their ICT teaching capabilities. Using a mixed-methods approach, the study employs a combination of questionnaire surveys and interviews to collect both quantitative and qualitative data. It investigates the demographic profiles of teachers, the current situation and challenges related to ICT teaching, and the factors affecting their ICT proficiency. Additionally, it explores strategies to enhance ICT teaching abilities, evaluates the effectiveness of these strategies, and provides recommendations for improving ICT integration in primary education. The findings reveal that teachers' ICT teaching abilities are influenced by factors such as age, sex, and teaching experience. Younger teachers, particularly those aged 21-31, are more familiar with technology, while older teachers require structured professional development. Common challenges include technical problems, insufficient training, and limited access to resources. The study highlights that teacher training, educational policy support, and resource accessibility are crucial factors influencing ICT teaching effectiveness. Key strategies for enhancing ICT teaching abilities include structured professional development, collaborative learning, and improved resource accessibility. The implementation of these strategies has positively impacted ICT integration, but challenges related to resources and continuous professional development remain. Furthermore, the study reveals that ICT-related challenges are consistent across demographic groups, suggesting the need for institution-wide interventions. Factors such as teacher training mechanisms and policy support did not significantly vary across demographic profiles, indicating that systemic factors are more influential than individual characteristics.

Keywords: *Primary school teachers, Informatization teaching ability, Promotion strategy, ICT.*

A. Introduction

The new generation of information technology represented by big data, cloud computing, artificial intelligence, and the Internet of Things has accelerated breakthroughs, which has increasingly shown a trend of cross-integration between technologies and disciplines, opening more space for innovation. With the development of information technology, informatization has become an important standard to measure the development of a country or region, while educational informatization as an important factor of national informatization, is the basic condition to promote national modernization. Education informatization also gives full play to the advantages of modern information technology and pays attention to the comprehensive and deep integration of information technology and education. Education for all of education development in the information age.

The integration of information technology in the field of education has promoted the deep reform of education and teaching. Effective learning depends on high-quality teaching activities (Rockoff 2004). For example, high-quality information-based instruction can promote

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individualized foreign language instruction (Xie et al., 2022) and make abstract mathematical knowledge more accessible (Schorr et al., 2022), and overcome the barriers of time and space to learning (Kang, 2017).

According to the data released by the Ministry of Education of China, there are 6.6294 million full-time teachers in primary schools in China, forming a large and diverse teaching workforce. If these teachers can enhance their information-based teaching abilities, they will be able to lead innovation in the education field. However, teachers' knowledge and skills to use ICT in China are underdeveloped, let alone their competence to integrate ICT and teaching practice (Le & Wang, 2004). Teachers' practice and application of ICT need to catch up to consciousness (Fan, 2015). Many teachers felt that there was an urgent need for training related to educational technology (Xie et al., 2022). They may use ICT without taking the curriculum's or its justification's logic into account (Xin, 2013). It is challenging for teachers in this situation to design and carry out high-quality ICT-based learning activities.

Teaching ability, particularly in the context of technology use, can be comprehensively defined as the integration of various skills, knowledge, and attitudes that enable teachers to effectively facilitate learning. This encompasses not only the traditional pedagogical skills and content knowledge but also the adept use of technology to enhance the teaching and learning process. One widely recognized framework for understanding this integration is the Technological Pedagogical Content Knowledge (TPACK) model. TPACK highlights three core components: Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK). TK involves understanding various technologies, their functionalities, and how they can be incorporated into teaching practices. PK pertains to the strategies and methods for effective teaching and classroom management. CK refers to the teacher's mastery of the subject matter being taught. When these components intersect, teachers can create dynamic, interactive, and effective learning experiences that leverage technology to its fullest potential.

Mishra and Koehler (2006) introduced the TPACK framework, emphasizing that effective technology integration in teaching requires an understanding of the interplay between technology, pedagogy, and content. This model has been widely adopted and validated in various educational contexts, providing a comprehensive approach to integrating technology into teaching.

ICT teaching is a complex teaching process with various influencing factors. Existing research shows that scholars (Gundel et al., 2019; Habibi et al., 2020; Postholm, 2020; Yildiz Durak & Saritepeci, 2019) unanimously agree that the teaching attitude of teachers and the school's management of information technology have an impact on teachers' ability to teach using information technology. In addition, information technology teaching requires hardware facilities and online teaching resources. Therefore, the availability of hardware facilities and the richness of online teaching resources also affect teachers' ability to teach using information technology.

The advancement of educational technology has led to new teaching paradigms that rely heavily on ICT integration. Modern educators are expected to seamlessly incorporate technology into their teaching practices to boost student engagement, support personalized learning, and improve educational outcomes. John Hattie's (2009) research underscores the significant impact that effective technology use can have on student learning by offering diverse resources, enabling collaboration, and facilitating personalized educational experiences. However, the successful integration of ICT in teaching hinges on teachers having sufficient ICT skills and knowledge.

This study aims to address the gap in research by focusing on the ICT teaching abilities of primary school teachers in China. It covers various subjects at different educational levels, with a particular emphasis on mathematics and English. The study seeks to investigate and analyze the current state of ICT teaching abilities among elementary school teachers, identify existing issues, explore the underlying causes of these problems, and propose targeted strategies to improve ICT teaching competencies. By doing so, it aims to contribute to the broader effort of enhancing educational quality through effective technology integration in primary education.

This paper specifically focuses on the ICT teaching abilities of primary school teachers in China, with an emphasis on mathematics and English subjects. It aims to investigate and analyze the current state of elementary school teachers' ICT teaching abilities, identify existing problems, explore the underlying causes of these issues, and propose targeted strategies for improvement. By concentrating on these aspects, the study seeks to provide insights into enhancing the overall quality of education through effective technology integration in primary schools.

B. Methods

This study adopts a combination of questionnaire survey and interview, combined with quantitative and qualitative data collection and analysis methods. Based on the existing research results, this paper investigates the current situation of primary school teachers' information technology teaching ability from four dimensions: research ability, operation ability, adjustment ability and design ability. According to Koltagen's Onion model, the factors affecting information technology teaching ability are summarized into internal and external factors, especially in teaching attitude, teaching resources and school management. It is expected to analyze the influence degree of three dimensions on the teaching ability of information technology of primary and secondary school teachers. According to the problems found in the investigation, the author puts forward some measures to improve the primary school teachers' teaching ability of information technology.

In the context of investigating and analyzing the current situation of elementary school teachers' information-based teaching ability, employing a mixed method approach, combining both quantitative and qualitative methods, is essential for several reasons.

Employing a mixed methods approach allows researchers to gain a comprehensive understanding of the current situation of elementary school teachers' information-based teaching ability, identify existing problems, explore their underlying causes, and develop targeted strategies for improvement. Using only one method may not capture the full complexity of the phenomenon under study and may limit the depth of insights and the effectiveness of proposed interventions.

In the context of the study on enhancing ICT teaching ability among primary school teachers, integrating quantitative and qualitative data allows for a robust analysis of the effectiveness of various strategies. The "point of interface" in this study represents the intersection where statistical data on teaching improvements and qualitative feedback from teachers and students converge.

The participants of the study include primary school teachers from grades 1 to 6, who are selected randomly to represent a diverse sample of educators. These teachers are responsible for delivering a range of subjects across the primary education spectrum. To be included in the study, participants must have substantial experience with information technology (IT) in their teaching practices, specifically with courses that use ICT interfaces. This experience requirement is set at a minimum of one year to ensure that the participants have a solid understanding of both the theoretical and practical aspects of integrating ICT into education.

C. Results and Discussion

1. Demographic profile of the respondents in terms of age, sex, and teaching experience.

Table 1. The Demographic Profile of the Respondents

Demographic Profile	Frequency	Percentage	Rank
Age			
1. 21 - 31 years old	94	45.0 %	1
2. 32- 42 years old	55	26.3 %	2
3. 43 - 53 years old	30	14.4 %	3.5
4. 54- years old and above.	30	14.4 %	3.5
Total	**209**	**100.0%**	
Sex			
1. Female	124	59.3 %	1
2. Male	85	40.7 %	2
Total	**209**	**100.0%**	
Teaching Experience			
1-10 Years	78	37.3 %	1
11-20 Years	30	14.4 %	4
21-30 Years	48	23.0 %	3
31-Years and above	53	25.4 %	2
Total	**209**	**100.0%**	

The demographic profile of the 209 primary school teachers surveyed reveals notable patterns in age, sex, and teaching experience, which may influence their information-based teaching abilities in mathematics and English. In terms of age distribution, the majority of respondents (45.0%) fall within the 21–31 years old range, suggesting a substantial presence of younger, early-career educators who may possess stronger familiarity with digital tools due to generational exposure to technology. The next largest group comprises teachers aged 32–42 years (26.3%), followed by a tie between the 43–53 and 54+ years categories (14.4% each), reflecting a gradual decline in representation with age. This trend highlights a workforce where younger teachers dominate, potentially shaping the integration of technology in classrooms. Regarding sex, female teachers significantly outnumber their male counterparts, constituting 59.3% of respondents compared to 40.7%, a disparity common in primary education globally. Teaching experience, however, presents a more varied distribution: the largest cohort (37.3%) has 1–10 years of experience, followed by those with 31+ years (25.4%), 21–30 years (23.0%), and 11–20 years (14.4%). This mix of early-career and highly experienced educators suggests opportunities for mentorship and knowledge-sharing but may also indicate varying levels of adaptability to technological advancements.

Younger teachers (21–31 years) often exhibit greater technological familiarity due to generational exposure, enabling smoother integration of tools like gamified math apps or interactive English resources (Altan, et al, 2024) . However, studies note that older teachers (54+ years) can bridge competency gaps through structured professional development, as demonstrated in Turkey's post-pandemic upskilling initiatives. Teaching experience also plays a dual role: early-career teachers (1–10 years) may lack pedagogical confidence, while veteran teachers (31+ years) offer mentorship potential but face adaptability challenges (Qu, et al, 2023). Female teachers dominate primary education (59.3% in the sample), yet research indicates nuanced preferences.

Table 2. Overall Influence of Various Factors on the ICT Teaching Ability of Primary School Teachers

Indicators	Mean	Std Dev	Verbal Interpretation
1. Teacher Training Mechanisms	3.49	0.31	Sometimes
2. Educational Policy Support	3.50	0.31	Often
3. Effectiveness of Educational Technology	3.49	0.31	Sometimes
Overall Influence of Various Factors on the ICT Teaching Ability	3.49	0.19	Sometimes

The overall influence of various factors on the ICT teaching ability of primary school teachers, which is mixed, with an aggregate mean score of 3.49, falls in the "sometimes" category. Teacher training mechanisms received a mean of 3.49, suggesting that while training initiatives, such as workshops and professional development sessions—are in place, they may not be sufficiently comprehensive or continuous to fully empower teachers in integrating ICT into their classrooms. This observation supports previous findings that sustained, high-quality professional development is critical for effective technology integration (Chapman & Gaytan, 2009; Liang et al., 2017). In contrast, educational policy support was rated slightly higher (mean = 3.50), indicating that policies related to resource allocation, regulatory frameworks, and professional development are generally aligned with the goals of ICT integration. This alignment is important because a supportive policy environment can provide the necessary structure and resources for schools to adopt and maintain effective digital practices (Sang et al., 2010). However, the effectiveness of educational technology itself, with a mean score of 3.49, suggests that although digital tools and resources are in use, their impact on student engagement and learning outcomes remains inconsistent. This finding resonates with the work of Hattie (2009) and Tondeur et al. (2017), who noted that the benefits of educational technology are highly dependent on how well these tools are integrated into the instructional process. The composite rating of "sometimes" implies that while there are positive indicators— particularly in policy support—there are still significant challenges in teacher training and the effective use of technology that need to be addressed to fully enhance the ICT teaching ability of primary school educators.

Table 3. Strategies Aimed at Enhancing the ICT Teaching Ability of Primary School

Indicator	Mean	Std Dev	Verbal Interpretation
Design of Comprehensive Training Programs	3.50	0.30	Strong Agree
Promotion of Teacher Development Initiatives	3.47	0.32	Agree
Facilitation of the Development and Sharing of High-Quality Educational Resources	3.46	0.33	Agree

The data on the strategies aimed at enhancing the ICT teaching ability of primary school teachers through the design of comprehensive training programs indicates a generally positive evaluation, with an overall mean score of 3.50, which falls within the "Strongly Agree" range. Teachers strongly agree that training programs align with predefined learning objectives, content, activities, and assessments suggesting that these programs are well-structured to meet clear educational goals, a critical component in effective professional development (Darling-Hammond, Hyler, & Gardner, 2017; Guskey, 2002). Integration of technology tools into the training program is also viewed positively, underscoring the importance of modeling technology integration to enhance learning experiences and promote interactivity. This aligns with the TPACK framework (Mishra & Koehler, 2006; Ertmer, 2005).   While the comprehensive training programs are well-designed and effective in several key areas, the slightly lower ratings in instructional methods and evaluation highlight opportunities for improvement to further enhance the ICT teaching ability of primary school teachers.

The teacher development initiatives for enhancing ICT teaching ability indicate an overall positive perception, with an aggregate mean score of 3.47, falling within the "Agree" range. Teachers strongly agree that a wide variety of professional development opportunities—such as workshops, seminars, conferences, and online courses—are offered (mean = 3.65), reflecting the importance of providing diverse learning modalities that cater to different professional needs (Desimone, 2009). Collaboration and networking opportunities also received a high rating (mean = 3.59, strongly agree), suggesting that initiatives which promote peer interaction and the exchange of best practices are highly valued and are consistent with research highlighting the benefits of collaborative professional learning (Vescio, Ross, & Adams, 2008).

Strategies for facilitating the development and sharing of high-quality educational resources are generally well-received, with an overall mean of 3.46, which falls in the "Agree" category. Respondents strongly agree that there are dedicated platforms where teachers can easily access quality educational materials such as lesson plans, instructional videos, and worksheets.

Table 4: Summary of the Themes on the Proposed Strategies aimed at Enhancing the ICT Teaching Ability of Primary School Teachers.

Theme	Code		Exemplar	Participant
Need for Continuous and Practical ICT Training	Lack of hands-on training		"We have attended ICT training before, but most of it is focused on theory. We need hands-on workshops where we can practice using digital tools in real teaching scenarios."	Participant 3
	Difficulty in applying training		"Sometimes we learn new software during training, but we don't get enough time to apply it in our lessons, so we forget how to use it effectively."	Participant 7
	Limited access to training		"The ICT training sessions are not always accessible to all teachers. Some of us have to travel far, and it's difficult to balance training with our workload."	Participant 5
	Need for flexible learning options		"It would be better if training sessions were available online so we can learn at our own pace and revisit the lessons when needed."	Participant 1
Need for Institutional and Technical Support	Lack of ICT resources		"Even if we learn how to use technology, our schools lack enough resources like computers, projectors, and a stable internet connection."	Participant 2
	Need for administrative support		"School leaders should actively promote the use of technology and provide time for us to collaborate and share best practices."	Participant 6
	Need for technical assistance		"We need an ICT coordinator or expert in school who can guide us when we encounter technical difficulties. Without this, we struggle to troubleshoot problems on our own."	Participant 4

Theme 1: Need for Continuous and Practical ICT Training

Many teachers emphasized the importance of ongoing professional development to enhance their ICT teaching ability. They highlighted the gap between theoretical

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knowledge and practical application in the classroom. As one participant noted, *"We have attended ICT training before, but* most *of it is focused on theory. We need hands-on workshops where we can practice using digital tools in real teaching scenarios."* (Participant 3). Another teacher echoed this sentiment, saying, *"Sometimes we learn new software during training, but we don't get enough time to apply it in our lessons, so we forget how to use it effectively."* (Participant 7). This aligns with Ertmer and Ottenbreit-Leftwich (2019), who argue that teachers need experiential learning opportunities to develop confidence and competence in using technology for instruction.

Moreover, some teachers expressed concerns about the accessibility of training programs. One participant shared, *"The ICT training sessions are not always accessible to all teachers. Some of us have to travel far, and it's difficult to balance training with our workload."* (Participant 5). Another teacher suggested, *"It would be better if training sessions were available online so we can learn at our own pace and revisit the lessons when needed."* (Participant 1). These statements reflect the need for flexible and practical ICT training strategies that accommodate teachers' schedules and learning preferences.

Theme 2: Need for Institutional and Technical Support

Beyond training, teachers emphasized the role of institutional support in strengthening their ICT teaching ability. One participant pointed out, *"Even if we learn how to use technology, our schools lack enough resources like computers, projectors, and a stable internet connection."* (Participant 2). This highlights how infrastructure challenges hinder the effective use of ICT in teaching. According to Tondeur et al. (2017), successful ICT integration requires not only teacher training but also a supportive learning environment with adequate resources.

Additionally, some teachers noted the need for administrative support in encouraging ICT use. As one teacher mentioned, *"School leaders should actively promote the use of technology and provide time for us to collaborate and share best practices."* (Participant 6). Another teacher added, *"We need an ICT coordinator or expert in school who can guide us when we encounter technical difficulties. Without this, we struggle to troubleshoot problems on our own."* (Participant 4). These insights align with Voogt et al. (2018), who emphasize that institutional backing, technical assistance, and peer collaboration play critical roles in fostering ICT competence among teachers. These themes suggest that strategies for enhancing ICT teaching ability should focus on hands-on and accessible training, improving school infrastructure, and strengthening institutional support systems.

This aligns with Voogt et al. (2018), who stress that effective ICT training should be interactive and integrated into real classroom settings to ensure meaningful learning experiences. Similarly, Participant 6 pointed out, *"If training sessions included actual lesson planning with ICT tools, it* would *be easier to apply them in class."* This perspective is echoed by Tondeur et al. (2017), who highlight that teacher professional development

programs should bridge the gap between knowledge acquisition and classroom application.

Table 5. The Implementation Effects of the Strategies and Identifying Potential Areas for Optimization

Indicator	Mean	Std Dev	Verbal Interpretation
Overall Implementation Effects of the Strategies and Identifying Potential Areas for Optimization	3.44	0.34	Agree

The implementation of the proposed strategies to enhance ICT teaching ability in primary schools is generally effective. However, there remain areas that warrant further optimization. The high mean score for ICT usage in classroom instruction (3.64) suggests that tools such as interactive whiteboards, educational software, online resources, and multimedia presentations are well-integrated into teaching practices. This aligns with research emphasizing that effective integration of digital technologies can enhance student engagement and learning (Ertmer, 2005; Mishra & Koehler, 2006). However, the slightly lower rating for teachers' comfort with ICT integration (mean = 3.22) points to the need for additional professional development initiatives to build teacher confidence and competence, echoing findings by Guskey (2002) that ongoing training is critical for successful technology adoption.

Table 6: Summary of Themes that Explore the Effectiveness of Implementing the Proposed Strategies to Enhance ICT Teaching Ability

Theme	Code	Exemplar	Participant
Positive Impact of ICT Integration on Teaching Practices	Positive Impact	"The use of interactive whiteboards and online resources has made my lessons more engaging and interactive. Students are more interested and motivated to participate."	Participant 1
		"I notice a significant improvement in students' understanding when I use multimedia presentations to explain complex topics."	Participant 4
Challenges in Full Implementation Due to Resource and Technical Limitations	Resource & Technical Limitations	"Although the training is helpful, the school's infrastructure doesn't always support the use of ICT tools. Sometimes the internet connection is slow, and the	Participant 7

Theme	Code	Exemplar	Participant
		devices are outdated, which affects the quality of my lessons."	
		"Technical difficulties during lessons, such as problems with the projector or issues with software, can disrupt the flow of the lesson and frustrate both students and teachers."	Participant 5

Theme 1: Positive Impact of ICT Integration on Teaching Practices

This theme emerges from participants' positive reflections on how the integration of ICT has transformed their teaching methods and student engagement. Teachers reported that they have seen tangible benefits from using ICT in their classrooms. For example, Participant 1 said, *"The use of interactive whiteboards and online resources has made my lessons more engaging and interactive. Students are more interested and motivated to participate."* (Participant 1) Similarly, Participant 4 expressed, *"I notice a significant improvement in students' understanding when I use multimedia presentations to explain complex topics."* (Participant 4) These statements suggest that the integration of ICT has enhanced teaching effectiveness by increasing student participation and improving understanding, aligning with findings from Mouza (2018), who argues that ICT integration can make lessons more engaging, thus increasing student motivation and achievement.

Theme 2: Challenges in Full Implementation Due to Resource and Technical Limitations

While the proposed strategies have shown positive results, participants also highlighted challenges that hinder the full implementation of ICT-enhanced teaching. These challenges are often related to resource limitations and technical difficulties. As Participant 7 mentioned, *"Although the training is helpful, the school's infrastructure doesn't always support the use of ICT tools. Sometimes the internet connection is slow, and the devices are outdated, which affects the quality of my lessons."* (Participant 7) Participant 5 further emphasized, *"Technical difficulties during lessons, such as problems with the projector or issues with software, can disrupt the flow of the lesson and frustrate both students and teachers."* (Participant 5) These challenges underscore the importance of addressing infrastructural and technical support to ensure the sustainable use of ICT in teaching, a point supported by Anderson and Warchauer (2015), who argue that the effective use of ICT is contingent upon reliable technology and ongoing technical support.

Table 7. Problems Related to ICT Teaching Ability among Primary School Teachers when grouped according to Respondents' Demographic Profile

Indicators	Mean	Computed Value	P-value	Decision	Conclusion
Age					
1. 21 - 31 years old	3.47	3.984	0.263	Failed to reject Ho	No significant difference
2. 32- 42 years old	3.47				
3. 43 - 53 years old	3.49				
4. 54- years old and above.	3.59				
Sex					
1. Female	3.46	4554	0.090	Failed to reject Ho	No significant difference
2. Male	3.53				
Teaching Experience					
1. 1-10 Years	3.46	2.82	0.419	Failed to reject Ho	No significant difference
2. 11-20 Years	3.48				
3. 21-30 Years	3.55				
4. 31-Years and above	3.47				

There are no statistically significant differences in the problems related to the utilization of digital resources among primary school teachers when grouped by age, sex, or teaching experience. For the age groups, the mean scores are very similar, with teachers aged 21–31 and 32–42 both reporting a mean of 3.47, those aged 43–53 reporting a mean of 3.49, and teachers aged 54 and above showing a slightly higher mean of 3.59. However, with a computed value of 3.984 and a p-value of 0.263, these differences are not statistically significant, meaning that age does not substantially influence perceptions of challenges in digital resource utilization. Similarly, when examining gender differences, female teachers have a mean score of 3.46 compared to 3.53 for male teachers. The computed value and p-value (0.090) indicate that this slight difference is not significant, suggesting that both male and female teachers experience comparable challenges in using digital resources. In terms of teaching experience, the means range narrowly from 3.46 for teachers with 1–10 years of experience to 3.55 for those with 21–30 years, with the overall computed value of 2.82 and a p-value of 0.419 further supporting that teaching experience does not significantly affect the perceived challenges.

These findings suggest that the problems associated with the utilization of digital resources in ICT teaching are systemic rather than linked to individual demographic characteristics. Such consistency across groups is in line with previous research that has found institutional and contextual factors to be more influential in shaping ICT integration challenges than personal factors (Ertmer, 2005; Tondeur et al.,

2017). Consequently, efforts to enhance ICT teaching ability by addressing issues related to digital resource utilization should focus on broader systemic changes—such as improving infrastructure, ensuring high-quality digital content, and providing robust technical support—rather than targeting specific demographic subgroups.

Table 8. Influence of Various Factors on the ICT Teaching Ability of Primary School Teachers when grouped according to Respondents' Demographic Profile

Indicators	Mean	Computed Value	P-value	Decision	Conclusion
Age					
1. 21 - 31 years old	3.50	2.962	0.397	Failed to reject Ho	No significant difference
2. 32- 42 years old	3.48				
3. 43 - 53 years old	3.53				
4. 54- years old and above.	3.48				
Sex					
1. Female	3.50	5010	0.543	Failed to reject Ho	No significant difference
2. Male	3.49				
Teaching Experience					
1. 1-10 Years	3.50	2.37	0.498	Failed to reject Ho	No significant difference
2. 11-20 Years	3.49				
3. 21-30 Years	3.47				
4. 31-Years and above	3.52				

The overall influence of various factors on the ICT teaching ability of primary school teachers. It reveals that it does not significantly differ when grouped according to age, sex, or teaching experience. The computed p-values—age (p = 0.397), sex (p = 0.543), and teaching experience (p = 0.498)—are all above the 0.05 significance level, leading to the failure to reject the null hypothesis. This suggests that teachers, regardless of their demographic profile, perceive the impact of these factors on their ICT teaching ability similarly. The mean scores, which range from 3.48 to 3.53 for age groups, 3.49 to 3.50 for sex, and 3.47 to 3.52 for teaching experience, indicate a consistent and moderately positive perception of ICT teaching ability across all categories. These findings align with the study by Tondeur et al. (2017), which highlights that individual teacher characteristics, such as age and years of experience, may have less impact on ICT integration compared to institutional factors like professional development and administrative support. This suggests that improving ICT integration in primary schools should focus on enhancing these external support systems rather than targeting specific demographic groups. The consistency in mean values also supports the argument that continuous and equitable access to ICT training can help bridge gaps in perceived teaching ability across different teacher demographics.

D. Conclusion

The demographic profile of primary school teachers reveals a diverse group shaped by age, sex, and teaching experience, all of which influence their ICT teaching abilities. Younger teachers, particularly those aged 21-31, show stronger technological familiarity, while older educators may benefit from structured professional development to enhance their ICT skills. The predominance of female teachers reflects global trends in primary education, with gender-specific preferences in ICT tool usage.

The findings highlight several key challenges faced by primary school teachers in their ICT teaching ability, particularly in the areas of technology application, instructional design, and the utilization of digital resources. Teachers encounter technical problems, require more professional development in technology integration, and experience barriers such as limited access to resources and inadequate training.

The ICT teaching ability of primary school teachers is influenced by a combination of factors, with the overall effectiveness rated as "sometimes." While teacher training and educational policy support show positive signs, they may not be sufficiently robust or continuous to maximize their impact. The mixed effectiveness of educational technology further highlights the need for more consistent and comprehensive training programs and better integration of technology in classrooms to ensure meaningful improvements in teaching outcomes. Addressing these challenges is crucial for enhancing teachers' ICT capabilities.

The findings also reveal key strategies aimed at enhancing the ICT teaching ability of primary school teachers, highlighting the effectiveness of structured professional development programs, collaborative learning environments, resource accessibility, and data-driven instructional improvement. A thematic analysis of these strategies identifies four major themes: structured professional development, collaborative learning, resource accessibility, and instructional evaluation. The results indicate strong agreement regarding the effectiveness of well-designed training programs that integrate technology and provide hands-on learning experiences, though instructional methods and assessment mechanisms require further enhancement.

The implementation of the proposed strategies to enhance ICT teaching ability has demonstrated a generally positive impact, as evidenced by strong integration of digital tools in classroom instruction and improved student engagement. Teachers acknowledged the benefits of ICT, particularly in making lessons more interactive and effective. However, challenges remain, particularly in terms of resource availability, technical limitations, and the need for continuous professional development to improve teacher confidence in ICT use. While stakeholder feedback has been actively collected, there is room for further refinement in translating these insights into actionable improvements.

The findings indicate that the challenges related to ICT application, instructional design, and digital resource utilization among primary school teachers are generally consistent across demographic groups. While age significantly influences perceptions of instructional design challenges, sex and teaching experience do not show statistically significant differences in any of the examined areas.

Various factors, including teacher training mechanisms, educational policy support, and the effectiveness of educational technology, do not significantly influence the ICT teaching ability of primary school teachers when grouped according to their demographic profiles. Across all demographic variables—age, sex, and teaching experience—the computed p-values exceeded the 0.05 significance level, leading to the failure to reject the null hypothesis.

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