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Examine Primary School Teachers' Attitudes towards Technology Integration in Primary Education

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Abstract

In today's society, information and communication technology (ICT) has become an ever-present force, deeply ingrained in all aspects of our lives. Its crucial role in our daily routines highlights its significance, especially in education. This paper focuses on exploring the viewpoints of primary school teachers regarding integrating technology in their classrooms. Additionally, it examines how educators' academic backgrounds and years of teaching experience may influence their attitudes toward technology in primary education. A quantitative survey with a convenient sampling of 50 teachers was employed in this study. The research objectives include identifying primary teachers' attitudes toward technology use and investigating potential differences based on teaching experience and educational qualifications. The results highlight an increasing necessity to explore the subtle motivations and concerns that underpin teachers' technological attitudes.

Keywords: ICT, Viewpoints, Primary school teachers, Attitudes

1.0 Introduction

1.1 Background of the study
In the rapidly evolving landscape of our contemporary society, Information and Communication Technology (ICT) has established itself as an omnipresent force, permeating virtually every facet of our daily lives. Its indisputable indispensability underscores its profound significance in reshaping various domains, and one such critical domain is education. Within the educational sphere, particularly among educators, an increasingly compelling imperative exists to explore the perspectives and convictions teachers hold regarding the seamless incorporation of technology within primary school classrooms (Cidral et al.,2018, p. 273).

While numerous studies have explored the factors that impact the acceptance of e-learning from the standpoint of users, there needs to be more attention given to examining educators' attitudes toward incorporating ICT (Information and Communication Technology) policies. As noted by Welle-Strand and Thune (2003), there needs to be more clear guidance when it comes to the execution of e-learning systems. Hence, to gain insight into the shortcomings associated with implementing ICT educational policies, this research delved into teachers' perspectives regarding their disposition towards adopting such policies.

1.2 Research objectives and questions
The primary aim of this study is to evaluate primary teachers' attitudes towards utilizing technology in the instruction of pupils. The specific research objectives are as follows:
1. To assess primary teachers' attitudes regarding incorporating technology in teaching pupils.
2. To examine potential disparities in these attitudes based on the educational qualifications of teachers.
3. To investigate potential variations in these attitudes based on the teaching experience of primary teachers.
Hence, the research inquiries formulated as follows:
1.   What are primary school teachers' perspectives regarding incorporating technology in instructing students?
2.   Do disparities exist in teachers' viewpoints on the utilization of technology in teaching children, depending on their educational qualifications in the primary school context?
3.   Are there variations in teachers' perspectives regarding the application of technology in teaching children based on their years of teaching experience at the primary level?

1.3 The importance of the research
This study's significance lies in exploring preschool teachers' attitudes and viewpoints regarding integrating technology into classroom instruction. The potential benefits of this research extend to various stakeholders, including educators, parents, school administrators, and educational authorities like the Ministry of Education.
   Primary education holds a crucial place in a child's life, as the teaching approaches employed during this period can have a lasting impact on their future educational journey and lay the groundwork for cognitive development. Primary school teachers must grasp the significance of technology in education and learn how to incorporate it into their teaching practices effectively.

2.0 Literature Review

2.1 Definition of ICT
Information and Communication Technology (ICT) has profoundly impacted various facets of our lives, both in professional and personal spheres, by enhancing the dissemination of knowledge and augmenting the flow of information and communication. ICT's continuous evolution has brought forth many challenges for individuals(Gao et al.,2023a). ICT has revolutionized operational procedures within enterprises, brought about fundamental changes in education, and reshaped the methods through which students acquire knowledge(Al-Rahmi et al., 2020).

2.2 The Influence of ICT in Primary Education
The assessment of the success of ICT-based learning systems has been a prominent subject of inquiry in academic literature. The objective is to pinpoint the key factors contributing to the success of e-learning systems, intending to optimize their overall effectiveness (Eom & Ashill, 2018). For instance, recent research by Al-Fraihat et al.（2020） has discovered several factors that affect e-learning success, including the caliber of the e-learning system and the caliber of the support system. Technology integration in primary education has garnered substantial attention from researchers and educators alike due to its potential to enhance pedagogical practices, engage students, and prepare them for the digital age. Scholars have extensively examined the multifaceted dimensions of this integration, ranging from the adoption of interactive whiteboards and educational software to the utilization of tablets and online resources(Gao,2022).
   The attitudes of primary school teachers towards technology integration differ. These studies have probed into various aspects, such as the factors influencing teachers' attitudes, the impact of professional development on their technological proficiency, and the challenges and opportunities that arise in the process.
   Moreover, educators' academic backgrounds and years of pedagogical experience have been identified as factors that may influence their perspectives on technology integration(Gao et al.,2023b). Research has shown that teachers with diverse academic backgrounds may approach technology differently, and experience can shape their comfort and readiness to incorporate technology into their teaching methodologies.

3.0 Methodology

3.1 Research design
This research employs a methodology that conducted a questionnaire survey administered to 50 teachers at three primary schools with convenient sampling in Guangzhou, China, with rigorous quantitative analysis.

3.2 Instrument
This study aims to discern elementary school teachers' attitudes toward the utilization of technology and to explore potential disparities in these attitudes based on teachers' years of teaching experience and educational qualifications. The quantitative data collected through a survey will be analyzed using SPSS Version 24.

To address the first research question, descriptive statistics will be predominantly employed for analysis (Liu et al.,2022). Meanwhile, variance analysis will be the primary analytical method for the second and third research questions.

This research will adopt a methodological approach centered on a questionnaire survey administered to 50 primary school teachers in Guangzhou, China, emphasizing rigorous quantitative analysis. The questionnaire has been thoughtfully designed to ensure precision, assessing the attitudes of primary school teachers towards integrating technology into their teaching practices. It includes diverse sections, encompassing background details, educational backgrounds, and viewpoints on the utilization of technology within primary school classrooms. The questionnaire distribution will be facilitated through the WeChat mini-program "Questionnaire Star," and t The Statistical Package for the Social Sciences (SPSS) will be used for the analysis of the gathered data.

4.0 Findings
The survey collected 50 questionnaires in total, and the results will be displayed in tabular form. The study encompasses an analysis and discussion of primary teachers' collective beliefs regarding integrating technology in teaching pupils. The results on variables such as variations in primary teachers' opinions about using technology to teach students, based on their educational backgrounds and years of teaching experience, will also be discussed and explained. The data was analyzed to address the following research inquiries.

4.1 Data analysis
The demographic features of the research participants were examined using descriptive statistics. This included elements including age, gender, education, and years of teaching experience. Additionally, descriptive statistics were used to quantify primary school teachers' attitudes toward incorporating technology into their lesson plans, effectively answering the original research question.

4.1.1 Description of the population's demographics.

Table 1. The participant's gender

Gender	Frequency(N)	Percentage(%)
Male	5	10
Female	45	90
Total	50	100

a) Participants' Gender Distribution
The data presented in the figure (Table 1) illustrates the gender distribution of 50 participating teachers, with 5 male teachers and 45 female teachers. Notably, the number of female participants significantly surpasses that of male participants, with female teachers outnumbering their male counterparts by more than 9 times. This discrepancy is reflective of the greater prevalence of female teachers in the teaching profession.

b) Participants' Age Distribution
The second aspect subjected to descriptive analysis pertains to the age distribution of 50 participating teachers. It was observed that 24 teachers fall within the age range of 20 to 29 years, while 14 teachers are aged between 30 and 39. Additionally, 8 teachers belong to the age group of 40 to 49, and only 4 teachers fall within the 50 to 59 age range. The data indicates a declining trend in participant numbers as age increases, with fewer teachers in the older age categories.

Table 2. Age of Participants

Age	Frequency(N)	Percentage(%)
20-29 years old	24	48
30-39 years old	14	28
40-49 years old	8	16
50-59 years old	4	8
Total	50	100

Table 3. Analysis of the academic level of Participants

Education level	Frequency(N)	Percentage(%)
College	14	28
Bachelor's Degree	34	68
Master's Degree	1	2
Others	1	2
Total	50	100

c) Academic level
The third aspect of the descriptive analysis centers on the educational qualifications of the participants. Out of the 50 teachers in the study, 14 hold diplomas or higher degrees from teacher's colleges, while 34 possess bachelor's degrees. Additionally, one teacher has a master's degree and other educational qualifications. It's worth noting that in the questionnaire, there were no respondents who held Ph.D. degrees or technical secondary school degrees(Gao et al.,2023c). Therefore, the category labeled "other qualifications" may encompass varying educational backgrounds, potentially ranging from higher to lower qualifications. The outcomes of this study

reveal a prevailing trend that the majority of primary school teachers exhibit a cheerful disposition towards incorporating technology within classrooms of primary classes. In contrast, quantitative analysis provides valuable insights into the prevalence of certain attitudes.

Table 4. Experience Analysis of the Participants

Years of Teaching Experiences	Frequency(N)	Percentage(%)
0-5 years	29	58
6-10 years	8	16
11-15 years	4	8
16-20 years	3	6
21 years and above.	6	12
Total	50	100

d) Participants' Teaching Experience
The fourth facet analyzed through descriptive analysis pertains to the teaching experience of the participants. It is evident that most teachers, totaling 29, have teaching experience ranging from 0 to 5 years. Eight teachers possess teaching experience of 6 to 8 years, while four teachers have engaged in teaching for 11 to 15 years. The group with the lowest representation comprises teachers with 16 to 20 years of teaching experience, comprising three individuals. Additionally, six teachers have 21 or more years of teaching experience.

5.0 Discussion

Regarding the original research topic, it's important to note that primary school instructors have positive attitudes about incorporating technology into their teaching strategies. A significant majority, surpassing 50% of the teachers, either 'agree' or 'strongly agree' with statements highlighting the advantages of incorporating technology into children's education. These advantages encompass heightened student engagement, enhanced enjoyment of the learning process, improved teaching efficacy, streamlined student assessment, more straightforward communication with parents, facilitation of personalized learning, promotion of social interactions among pupils, enhancement of cognitive skills, and positive contributions to overall child development.

The claim that "The use of technology makes learning more enjoyable" has the highest mean score (mean = 4.39). This increased mean highlights the instructors' steadfast belief that using technology in the classroom improves the way that kids learn. These findings align with similar observations made by Bicen and Kocakoyun (2018), who noted that using Kahoot, an online gamification-based learning application, resulted in a more engaging and enjoyable learning experience for children.

Conversely, the lowest mean score is associated with "The use of technology helps the pupils to be more engaged in learning " (mean=4.05), suggesting that teachers may have some reservations regarding technology's capacity to foster social interactions among children. Such mistrust is fair considering that kids aren't physically gathered in a common area where they can naturally connect, share stories, and gain crucial social skills. Hosokawa and Katsuwa (2018) and Twenge (2019), who noticed a deterioration in social contact among youngsters as their use of digital devices increased, have supported similar findings. There is no evidence from research to refute these conclusions. In general, educators tend to think that using technology in the classroom benefits students and improves the teaching-learning process as a whole. Research by Kalogiannakis and Papadakis (2019) supports this viewpoint. It is important to keep in mind that some research papers, including one by Mustafaoglu et al. (2018), claim that introducing technology to children at a young age can be harmful to their development and health.

Table 5. The feedback of the questionnaire

Items	Mean(N=50)	Std.Deviation
1. Technology in the classroom helps the pupils to be more engaged in learning.	4.05	0.673
2. Technology in the classroom helps the teacher to bring outside resources into the classroom more easily.	4.28	0.573
3. Technology in the classroom helps to make activities more enjoyable.	4.39	0.562
4. Technology in the classroom makes teaching more effective.	4.14	0.604

Research question 2, which sought to determine whether there were variations in beliefs regarding the use of technology in teaching pupils based on the academic qualifications of primary teachers, a one-way ANOVA was conducted. The resulting F-value [F=2.383, p=.082] for the group design classified by teachers' educational qualifications was found to have a negligible statistical impact, with p>0.05. This suggests that, from a statistical perspective, teachers' beliefs regarding the integration of technology into the education of young children do not exhibit significant differences, even when considering their diverse levels of educational attainment. Therefore, drawing from the ANOVA results, there are no noticeable disparities in beliefs concerning the use of technology in teaching pupils among primary education teachers based on their educational qualifications.

While there is a scarcity of research explicitly linking teachers' educational qualifications to their beliefs about technology use in classroom learning, certain studies have delved into the potential positive influence of increased educational qualifications among teachers on the overall quality of primary educational settings, as exemplified in the research conducted by Manning et al. (2019).

Additionally, other research, such as the study conducted by Bai, Wang & Chai (2021), has found that primary teachers who underwent professional development for teachers' programs reported increased   degrees of approval towards the integration of ICT tools in their classrooms.

Table 6 Belief in the use of technology: One-Way ANOVA

Source	ss	df	Mean Square	F	Sig.	Mean	Std. Deviation
Between Groups	484.917	3	161.639	2.383	0.82	2.78	0.679
Within Groups	3120.703	46	67.841				
Total	3605.620	49					
*SS=Sum of squares							

A one-way ANOVA was performed on study question 3, which intended to ascertain whether there were variations in beliefs towards the application of technology in educating children based on the years of teaching experience of primary educators. For the groups divided by the number of years of teaching experience, the resulting F-value [F=527, p=.707] was discovered to be statistically insignificant with p>0.05. This implies that despite wide variances in their levels of teaching experience, instructors' opinions about using technology to educate children do not show significant differences from a statistical standpoint. Therefore, drawing from the ANOVA results, there are no noticeable disparities in beliefs concerning the use of technology in teaching pupils among primary school teachers based on their cumulative teaching experience.

Table 7   the One-Way ANOVA of beliefs on using technology to instruct students based on primary education qualifications

Source	ss	df	Mean Square	F	Sig.	Mean	Std. Deviation
Between Groups	162.54	4	161.639	527	0.707	1.98	1. 421
Within Groups	3442.966	45	76.510				
Total	3605.620	49					
*SS=Sum of squares							

6.0 Conclusion & Recommendations

Results reveal that there is a significant gender disparity, with a much higher number of female teachers than male teachers, reflecting the predominant presence of women in this profession, which might have implications for the adoption of educational technology in primary school classrooms, as teachers of different genders may hold varying attitudes towards technology adoption. In addition, the age distribution suggests that younger teachers dominate the study, with a gradual decrease in participation as age increases, which implies tailoring educational technology training and support programs to cater to the needs of different age groups.

Regarding educational backgrounds, a diverse range of qualifications was observed. However, it's worth noting within sample, there were no respondents with doctoral degrees or technical secondary school qualifications. This indicates future educational technology training may need to accommodate varying educational backgrounds.

Additionally, regarding teaching experience, most teachers have 0-5 years of experience, which implies they require more support and training to integrate technology into their teaching practices. Simultaneously, a small subset of teachers has more extensive teaching experience, which necessitates different types of support measures.

However, while quantitative analysis can provide valuable insights into the prevalence of certain attitudes, it may need more depth to understand the underlying reasons for these attitudes. Hence, there is a growing need for qualitative studies that delve into the nuanced motivations and concerns that underlie teachers' attitudes toward technology.

These findings underscore the substantial impact of educational technology in primary education, highlighting the importance of considering differences when designing training and support programs. In conclusion, this literature review underscores the multifaceted nature of technology integration in primary education, emphasizing the exploration of teachers' attitudes, the influence of their academic backgrounds and experiences, and broader implications for stakeholders. This study contributes to a comprehensive understanding of contemporary educational paradigms by unraveling the intricate interplay between teachers' perspectives, technology integration, and primary school education.

Paper Contribution to Related Field of Study

The research contributes to the examination of Primary Education Teachers' Attitudes Toward the Integration of Technology.

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