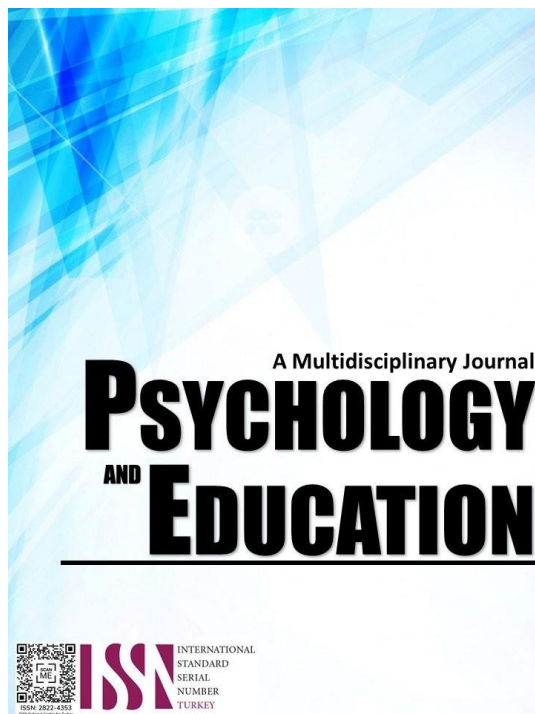


ICT PROFICIENCY FOR EFFICIENT CONDUCT OF DIGITAL CLASSROOM TEACHING



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ICT Proficiency for Efficient Conduct of Digital Classroom Teaching

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Abstract

This study investigates the integration of Information and Communication Technologies (ICT) among Kindergarten Teachers in the Bohol District, focusing on its impact on pedagogical practices and student learning outcomes. The purpose is to assess the current proficiency levels of ICT use and identify factors that influence effective integration in early childhood education. Guided by the Technological Pedagogical Content Knowledge (TPACK) framework, which emphasizes the intersection of technological, pedagogical, and content knowledge, this research aims to provide a comprehensive understanding of how ICT can enhance educational quality and foster digital literacy. The study employs a mixed-methods design, combining quantitative surveys and qualitative interviews to gather data from kindergarten teachers regarding their ICT usage, access to resources, and training experiences. Key findings indicate significant disparities in resource availability and professional development opportunities, contributing to a digital divide that affects teaching effectiveness. While teachers express willingness to integrate ICT, many face challenges due to inadequate training and limited access to quality equipment and broadband connections. Analysis reveals that interactive learning methods, supported by ICT, significantly enhance student engagement and understanding. Additionally, social media platforms, when used appropriately, can improve communication and interaction with course content. However, the effectiveness of these tools depends on teachers' ability to motivate and guide students in their use. The study concludes that targeted ICT enhancement training programs are essential to address existing gaps. These programs should focus on providing teachers with the necessary skills and resources to integrate technology effectively into their classrooms. By empowering educators through professional development and improved access to ICT resources, the study aims to contribute to a more equitable and effective educational environment, ultimately benefiting both teachers and students.

Keywords: *ICT proficiency, ICT awareness, ICT integration*

Introduction

The integration of Information and Communication Technologies (ICT) in education involves utilizing technology-based teaching and learning processes that incorporate various learning technologies in schools (Wang, 2008). The increasing momentum of ICT integration in educational literature underscores its significance in modern education (Lawrence, 2018). ICT's growth has opened vast opportunities for enhancing education by enabling teaching and learning to occur anytime and anywhere (Lawrence, 2020). This flexibility is crucial for improving the quality of classroom interactions and facilitating personalized learning experiences that cater to individual needs (Lawrence & Tar, 2018).

Technology plays a vital role in education. With rapid advancements in technology, the demand for human resources skilled in ICT is increasing (Parojenog, 2023). Educators can leverage digital tools such as computers, tablets, educational software, and internet resources to support instruction, promote collaboration, and personalize student learning experiences by incorporating ICT into the teaching-learning process. This integration also enables innovative teaching methods like blended learning and flipped classrooms, combining traditional instruction with online resources and interactive activities. Additionally, ICT integration aligns with the broader goal of developing digital literacy and 21st-century skills among students, preparing them to thrive in a technology-driven society.

Educators increasingly recognize the significant role of ICT in education at all levels. Teacher education institutions and programs are expected to model new pedagogies and learning tools while developing strategies to enhance the teaching-learning process (UNESCO, 2002). Providing pre-service teachers with opportunities to experiment with ICT before classroom implementation is essential (Albirini, 2006). The advent of web-based interactive technologies has expanded the possibilities for teachers and students to utilize technology in education.

As teachers become more proficient with ICT integration and researchers incorporate teachers' pedagogical considerations into ICT integration proficiency (Koehler et al., 2007; Angeli & Valanides, 2009), greater differentiation in planning, teaching, and evaluation may be achieved. Educational technology policymakers emphasize professional development as key to effectively helping teachers integrate ICT into their lessons (Culp et al., 2005). Teachers' willingness to improve their teaching with technology is evident when they practice ICT skills, participate in conferences, read journals about ICT integration methods, or take online courses for professional development.

Interactive learning, facilitated by ICT, is effective because it engages students with the lecture, transforming them from passive listeners to active participants (Biggs, 2003). Evidence suggests that students understand and retain teaching material better and enjoy learning more when actively engaged (Murray & Brightman, 1996). This engagement can improve retention and success rates of educational programs. Interactive teaching encourages students to interact more with teachers and peers, enhancing their learning

experience (Light & Cox, 2001).

Social media platforms like Facebook allow students to communicate with teachers and peers more easily and quickly, engage more with course content, and improve their overall learning experiences (Awidi et al., 2019; Bowman & Akcaoglu, 2014; Ramadan, 2017). However, it is crucial to understand the factors that motivate students to use Facebook for learning, especially in informal settings. Without this understanding, integrating Facebook into teaching and learning can hinder rather than facilitate learning (Awidi et al., 2019).

Disparities in access to ICT resources and teacher training can create a digital divide, affecting education quality in different regions or demographic groups. Some teachers may lack adequate training to use ICT tools effectively for teaching. Addressing this issue is crucial for ensuring teachers can fully leverage technology to enhance education.

For students and teachers to fully participate in educational practices, they need access to quality equipment and broadband connections (Warschauer, 2004). The digital divide and geographical disparities in access to necessary materials and resources must be addressed (DiMaggio & Hargittai, 2001; Selwyn, 2003; Warschauer & Matuchniak, 2010). Quality training in ICT is significant and can substantially affect learning and teaching experiences (Hargittai, 2002).

The Technological Pedagogical Content Knowledge (TPACK) framework proposed by Mishra and Koehler (2006) offers a comprehensive model for guiding ICT integration in education. TPACK emphasizes the intersection of technological, pedagogical, and content knowledge, providing a holistic approach to effective ICT integration. It highlights the dynamic interplay between these elements and how they intersect to enhance learning outcomes and engagement with the curriculum. The TPACK framework is particularly relevant for context-specific and content-driven use of technology in education.

Despite the benefits of ICT integration, implementation gaps exist, particularly in specific educational domains like primary education. This research aims to determine the ICT proficiency among Kindergarten Teachers of the Bohol District by assessing the level of integration and the pedagogical impact on student learning. The level of integration refers to how effectively teachers incorporate ICT tools and methods into their teaching practices. The pedagogical impact includes the influence of ICT on student engagement, understanding, retention, and overall learning outcomes. The results of this study will form the basis for a proposed ICT enhancement training program.

Research Questions

This research assessed the Teachers' ICT proficiency, teaching pupils of Sierra Bullones, District of Sierra Bullones, Bohol for School Year 2023 – 2024 as basis for school-wide ICT Proficiency Plan. Specifically, this research answered the following questions:

1. What is the profile of the respondents in terms of:
 - 1.1. age;
 - 1.2. gender;
 - 1.3. number of years teaching experience;
 - 1.4. highest educational attainment; and
 - 1.5. relevant trainings and seminars attended?
2. What is the respondent's level of proficiency in using ICT in terms of:
 - 2.1. knowledge and skills of Kindergarten Teachers; and
 - 2.2. ICT integration in teaching and learning?
3. What is the impact of Teachers' ICT Proficiency on pedagogy and student learning?
4. What is the level of problem faced by the kindergarten teachers in terms of school ICT integration?
5. Is there a significant correlation between the level of proficiency of the respondent in ICT in terms of knowledge and skills of Kindergarten teachers and the impact of teachers' ICT proficiency on pedagogy and student learning?
6. Is there a significant correlation between the level of proficiency of the respondent in ICT in terms ICT integration in teaching and learning and the impact of teachers' ICT proficiency on pedagogy and student learning?
7. Is there a significant relationship between the teachers' ICT proficiency and its level of impact on pedagogy and student learning?
8. What foundational elements can be proposed as the basis for an ICT Proficiency Plan?

Methodology

Research Design

The researcher used a descriptive survey method to evaluate ICT proficiency in teaching and learning. A structured questionnaire was developed to assess educators' familiarity with digital tools, frequency of technology use, and perceptions of ICT's impact on student outcomes. The sample included teachers from diverse educational settings to ensure a comprehensive view of ICT proficiency. Data collection involved inviting teachers via email, school announcements, and professional networks, with confidentiality and anonymity assured to encourage participation. The questionnaire covered basic technological skills, advanced competencies, attitudes toward

technology, self-efficacy, and perceived barriers to ICT integration. Statistical software was used to analyze the data, providing an overview of ICT proficiency among teachers.

Participants

The study involved 23 Kindergarten teachers from various elementary schools across Sierra Bullones District, Bohol. These educators are crucial in shaping early educational experiences for young learners. Table 1 details the distribution of respondents from each school within the district, ensuring comprehensive representation.

The schools included in the study are Abachanan Elementary School (ES), Anibongan Elementary School (ES), Bugsoc Elementary School (ES) with two respondents, Cahayag Elementary School (ES), Canlangit Elementary School (ES), Cantaub Elementary School (ES), Concepcion Elementary School (ES), Danicop Elementary School (ES), Dusita Elementary School (ES), La Union Elementary School (ES), Magsaysay Elementary School (ES), Matin-ao Elementary School (ES), Nan-od Elementary School (ES), Salvador Elementary School (ES), San Agustin Elementary School (ES), San Isidro Elementary School (ES), San Jose Elementary School (ES), San Juan Elementary School (ES), Sierra Bullones Central Elementary School (SBCES) with two respondents, and Villa Garcia Elementary School (ES).

This diverse representation ensures that insights into ICT proficiency are gathered from various educational contexts within the Sierra Bullones District. By analyzing ICT integration across different schools, the study aims to identify disparities and commonalities, providing a nuanced understanding that can inform effective strategies for enhancing ICT proficiency in kindergarten education.

Table 1. *Distribution of the Respondents*

<i>Respondents</i>	<i>Number of Respondents</i>	<i>Percentage</i>
Abachanan ES	1	4.34%
Anibongan ES	1	4.34%
Bugsoc ES	2	8.69%
Cahayag ES	1	4.34%
Canlangit ES	1	4.34%
Cantaub ES	1	4.34%
Concepcion ES	1	4.34%
Danicop ES	1	4.34%
Dusita ES	1	4.34%
La Union ES	1	4.34%
Magsaysay ES	1	4.34%
Matin-ao ES	1	4.34%
Nan-od ES	1	4.34%
Salvador ES	1	4.34%
San Agustin ES	1	4.34%
San Isidro ES	1	4.34%
San Jose ES	1	4.34%
San Juan ES	1	4.34%
SBCES	2	8.69%
Villa Garcia ES	1	4.34%
Total	23	100%

Instruments

Central to this study is a survey questionnaire designed for kindergarten teachers in the Sierra Bullones District. This instrument, based on a validated framework, explores teachers' ICT proficiency, usage, challenges, and perceptions. It aims to uncover insights into ICT integration, identify barriers, and establish correlations between ICT proficiency and teaching practices. Administered district-wide, the questionnaire ensures a diverse sample, facilitating rigorous statistical analysis to inform actionable recommendations for enhancing ICT in early childhood education.

Procedure

The research process began with securing formal approval through a transmittal letter addressed to the School Division Superintendent of Bohol Division. This letter outlined the study's objectives and sought permission to conduct research within educational precincts, ensuring cooperation and access to resources.

Once approval was obtained, the researcher engaged kindergarten teachers, providing clear instructions and explaining the study's significance. Questionnaires were distributed over two days, allowing time for thorough completion. Completed questionnaires were collected systematically to ensure data integrity.

Following data collection, responses were meticulously summarized and organized for detailed analysis. Statistical tools were employed to identify patterns and relationships, yielding insights into ICT integration among kindergarten teachers in the Sierra Bullones District. This rigorous approach ensured reliability and informed future educational strategies.

Data Analysis

In the analysis and interpretation of data, the following statistical treatments were used:

Frequency. The qualitative data, including responses from the survey questionnaire, were analyzed using descriptive statistical treatment. The findings were presented with percentage, average & rank order. For statistical purposes, the responses on the level of proficiency of the respondents in ICT were categorized as Very High, High, Low, and Very Low with weight equivalents of 4, 3, 2, and 1 respectively.

Weighted Mean. This technique is used to measure the central tendency where some values are given importance over others. This is used to gauge the average value of responses to items in the questionnaire (Ferguson, 1992: 482)

Pearson Product Moment Coefficient of Correlation. To determine the significant degree of correlation between the teachers' ICT proficiency and its level of impact on pedagogy and student learning the data were subjected to Pearson Product Moment Coefficient of Correlation using the formula (Angeles, 2005:269). The obtained Pearson Product Moment Coefficient of Correlation ratio was checked against the Table of Significant values at 0.05 level of significance.

Ethical Considerations

This study adhered to ethical standards by obtaining informed consent from all participants, ensuring confidentiality, and maintaining voluntary participation without coercion. No harm happened to participants, and the study received ethics committee approval. The researcher declared no conflicts of interest and reported findings transparently and honestly. Cultural sensitivity was respected throughout the research process.

Results and Discussion

This section presents, analyzes, and interprets the collected data systematically to verify and substantiate the research questions. The presentation covers various aspects, including the profile of the respondents in terms of age, gender, number of years of teaching, highest educational attainment, and relevant trainings attended. Additionally, the study examined the problems faced by kindergarten teachers in integrating ICT into their teaching practices. The relationship between teachers' ICT proficiency and its impact on pedagogy and student learning was also investigated.

To analyze the data, descriptive and inferential statistics were used. Descriptive statistics provided an overview of the respondents' profiles and performance in the identified competencies. Inferential statistics were employed to generalize the relationship between the level of ICT knowledge and skills of kindergarten teachers, the level of ICT integration in teaching and learning, and the extent of the impact on student learning.

Profile of the Teachers

This exudes the profile of the respondents in terms of age, gender, number of years of teaching, highest educational attainment, and relevant training attended.

Age

Age significantly influences human behavior, development, and interaction, impacting fields like education, psychology, health, and social sciences. Recognizing age differences is crucial for accurate data interpretation and effective interventions.

Table 2 shows the age distribution of teachers, with most being 31–40 years old, followed by 20–30 years old, and fewer in the 41–50 range. There are no teachers aged 51–60 or over 61.

Younger teachers (20–30) may offer fresh perspectives and tech skills, while older teachers (31–50) bring experience and expertise. This age distribution impacts educational practices, contrasting with studies indicating older teachers' lower confidence in ICT integration (Lee, 1997; Teo, 2008; Yaghi, 2001). Older teachers often lack computer education and need training to effectively use technology in teaching.

Table 2. Age ($N = 23$)

Items	<i>F</i>	%
Age (years)		
20 - 30	7	30.43
31 - 40	11	47.83
41 - 50	5	21.74
	Weighted Mean	Standard Deviation
Overall	36.3043	6.5605

Gender

Gender refers to the social, cultural, and psychological attributes and roles that societies assign to men and women. In ICT proficiency for digital teaching, understanding gender differences helps identify gaps and biases in training. Addressing these needs ensures all

teachers, regardless of gender, are equally proficient with digital tools, enhancing teaching and learning outcomes.

Table 3 shows that all 23 teachers in the sample are female, indicating a gender imbalance. This affects representation and diversity among educators and highlights the need for an inclusive learning environment.

Contrary to some previous studies (e.g., Russell & Bradley, 1997; Todman, 2000), which found that female teachers reported more computer anxiety and slower acquisition of computer self-efficacy, this study emphasizes the importance of considering gender in ICT use in education.

Table 3. *Gender (N = 23)*

<i>Items</i>	<i>F</i>	<i>%</i>
Gender		
Female	23	100

Years of Teaching

Years of teaching refers to the total time an individual has spent in the teaching profession. This metric helps understand how experience influences ICT integration in the classroom. Experienced teachers may struggle with new technologies, while newer teachers might be more tech-savvy but less experienced in classroom management. Tailored professional development based on years of experience can enhance ICT proficiency and teaching effectiveness.

Table 4 shows that 22 out of 23 teachers (95.65%) have 10 years or less of teaching experience, indicating a predominance of relatively new teachers. Only one teacher (4.35%) has 11–20 years of experience.

Research generally shows that teaching experience influences ICT use (e.g., Wong & Li, 2008; Giordano, 2007; Hernandez-Ramos, 2005). Gorder (2008) found that experienced teachers' comfort with technology and instructional flexibility correlates with effective ICT adoption. However, newer teachers tend to integrate technology more readily, as shown by the U.S. National Center for Education Statistics (2000) data, where less experienced teachers used computers more frequently in their teaching.

Table 4. *Years of Teaching (N = 23)*

<i>Items</i>	<i>F</i>	<i>%</i>
Number of years of teaching		
10 years below	22	95.65
11- 20	1	4.35
	Weighted Mean	Standard Deviation
Overall	5.8261	3.2565

Highest Educational Attainment

Highest educational attainment refers to the highest level of formal education an individual has completed. This variable is critical in research as it correlates with competencies and skills needed for effective teaching and technology integration. In the context of ICT proficiency, examining educational attainment helps explore how different backgrounds impact a teacher's ability to use technology. Higher qualifications may provide advanced knowledge and technical skills, facilitating better ICT adoption, while those with less education might need more training.

Table 5 shows that most teachers have completed MA coursework (11 out of 23, or 47.83%), followed by those with a bachelor's degree (10 out of 23, or 43.47%). One teacher (4.35%) has a completed MA degree, and one has completed PhD coursework. No teachers in the sample have a completed PhD degree. Educational attainment impacts subject knowledge, teaching methods, and expertise, with higher degrees often leading to more specialized knowledge and improved teaching practices.

Table 5. *Highest Educational Attainment (N = 23)*

<i>Items</i>	<i>F</i>	<i>%</i>
Highest Educational Attainment		
Bachelor's Degree	10	43.47
MA (units)	11	47.83
MA Graduate	1	4.35
PhD (units)	1	4.35

Relevant Trainings Attended

Relevant trainings attended refer to the specific professional development sessions, workshops, seminars, or courses that an individual has participated in, which are directly related to enhancing their skills and knowledge in a particular field. In research, this variable is crucial for assessing how continuous professional development influences competency in specific areas. In the context of ICT proficiency for the efficient conduct of digital classroom teaching, examining the relevant trainings attended by teachers allows researchers to evaluate the impact of these trainings on their ability to integrate technology into their teaching practices effectively. These trainings may cover various topics, including the use of digital tools, instructional technology strategies, and best practices for



online pedagogy. By analyzing the types and frequencies of relevant trainings attended, researchers can identify the correlation between professional development and ICT proficiency, determining how well-equipped teachers are to utilize technology to enhance student learning. This understanding can inform the design of targeted training programs that address gaps in knowledge and skills, ultimately leading to more efficient and effective digital classroom teaching.

The data in Table 6 presents the profile of teachers in terms of the relevant trainings they have attended, particularly related to ICT (Information and Communication Technology). The data provides seven categories of relevant ICT trainings attended by teachers. Based on the data, the most attended training category is Blended Learning Strategies, with 14 out of 23 teachers (60.87%) having attended this training. Online Teaching Tools and Platforms training is the second most attended category, with 11 teachers (47.83%). Other training categories have lower attendance percentages, ranging from 30.43% to 17.39%.

The data suggests that a significant proportion of teachers have received training in various aspects of ICT in education. This indicates a growing emphasis on integrating technology into teaching practices. The higher attendance in Blended Learning Strategies and Online Teaching Tools and Platforms training reflects the increasing importance of online and hybrid learning environments.

Recent research by Gomes (2005) relating to various subjects concluded that lack of training in digital literacy, lack of pedagogic and didactic training in how to use ICT in the classroom and lack of training concerning technology use in specific subject areas were obstacles to using new technologies in classroom practice.

Some of the Saudi Arabian studies reported similar reasons for failures in using educational technology: the weakness of teacher training in the use of computers, the use of a “delivery” teaching style instead of investment in modern technology (Alhamd, Alotaibi, Motwaly, & Zyadah, 2004), as well as the shortage of teachers qualified to use the technology confidently (Sager, 2001).

Table 6. *Relevant Trainings Attended (N = 23)*

Items	F	R
Relevant ICT related trainings		
Digital Classroom Management	7	3
Online Teaching Tools and Platforms	11	2
E- Learning Course Development	1	6
Digital Literacy Skills for Educators	3	5
Blended Learning Strategies	14	1
Social Media for Educational Purposes	4	4

Level of Proficiency of the Respondent in ICT

This exudes the level of proficiency of the respondent in ICT in terms of knowledge and skills of Kindergarten Teachers, and ICT integration in teaching and learning.

Knowledge and Skills of Kindergarten Teachers

Table 7. *Level of Proficiency of the Respondent in ICT in terms of Knowledge and Skills of Kindergarten Teachers (N = 23)*

KNOWLEDGE AND SKILLS OF KINDERGARTEN TEACHERS	Weighted Mean	Standard Deviation	Description
Board	3.6087	0.5830	Very High
LCD Projector	2.9565	0.8779	Very High
Television	3.6957	0.4705	Very High
Audio Application	3.0435	0.7674	Very High
Smart Phone	3.6957	0.4705	Very High
Computer	3.3478	0.5728	Very High
OVERALL	3.3913	0.6986	Very High

The knowledge and skills of kindergarten teachers encompass a diverse range of competencies vital for fostering early childhood development and facilitating effective learning experiences. Their expertise includes pedagogical strategies, classroom management techniques, and interpersonal abilities crucial for engaging young learners and collaborating with colleagues and parents. In today's digital age, proficiency in Information and Communication Technology (ICT) has become increasingly essential for educators to enhance teaching practices and engage students effectively. Therefore, assessing the level of proficiency of kindergarten teachers in ICT is imperative for understanding how well-equipped they are to leverage technology in their instructional methods.

Based on the data presented in Table 7, the level of proficiency of the respondents in ICT (Information and Communication Technology) in terms of knowledge and skills of kindergarten teachers is at a "very high" level of proficiency. The weighted mean score for overall proficiency is 3.3913, indicating a "very high" level of proficiency. The standard deviation score of 0.6986 suggests relatively low variability or high agreement among the respondents regarding their overall ICT proficiency.

The data indicates that the respondents, who are kindergarten teachers, possess a very high level of proficiency in using various ICT

tools and technologies. This proficiency level indicates that they have a good understanding and command of these tools, which can be beneficial for integrating technology into their teaching practices. Their proficiency in using ICT tools such as the board, LCD projector, television, audio application, smart phone, and computer can contribute to enhancing their teaching methods and engaging students in meaningful and interactive learning experiences.

Integration in Teaching and Learning

Integration in teaching and learning refers to the seamless incorporation of various instructional strategies, resources, and technologies to enhance the educational experience and promote student learning. It involves aligning curriculum objectives with diverse teaching methods and leveraging tools such as multimedia presentations, online resources, and interactive platforms to create dynamic and engaging learning environments.

The level of proficiency of respondents in ICT directly influences their ability to effectively integrate technology into their teaching practices. Educators with higher levels of ICT proficiency are better equipped to leverage digital tools and resources to support diverse learning styles, foster student engagement, and facilitate interactive and personalized learning experiences.

Table 8. *Level of Proficiency of the Respondent in ICT in terms Integration in Teaching and Learning (N = 23)*

ICT INTEGRATION IN TEACHING AND LEARNING	Weighted Mean	Standard Deviation	Description
prepare lessons and reports	3.4348	0.5898	Very High
internet to search teaching material	3.5652	0.5069	Very High
communicate with learners and parents	3.5217	0.5931	Very High
especially computer and its application	3.3043	0.6350	Very High
monitor learners' progress and performance	3.3913	0.6564	Very High
evaluate learners' progress and performance	3.4348	0.5898	Very High
make presentation slides/delivery	3.3478	0.7141	Very High
provide online work or assignment	2.7826	0.7952	High
prepare online work or assignment	2.8696	0.8149	High
OVERALL	3.294686	0.700292	Very High

The table shows data related to the level of proficiency of the respondents in integrating information and communication technology (ICT) in teaching and learning. The respondents' proficiency in preparing lessons and reports has a weighted mean of 3.4348 and a standard deviation of 0.5898. This indicates a "very high" level of proficiency, suggesting that the respondents are highly skilled in this aspect of ICT integration.

The use of the internet to search for teaching materials has a weighted mean of 3.5652 and a standard deviation of 0.5069, also indicating a "very high" level of proficiency. It suggests that the respondents are effectively utilizing the internet to find relevant teaching resources. The respondents' proficiency in providing online work or assignments has a weighted mean of 2.7826 and a standard deviation of 0.7952, falling under the category of "High" proficiency. This suggests that the respondents have a relatively lower level of proficiency in this aspect compared to other areas.

Pedagogy and Student Learning

Pedagogy and student learning encompass the methodologies, approaches, and interactions employed by educators to facilitate meaningful learning experiences for students. Effective pedagogy involves understanding students' diverse needs, designing engaging lessons, and implementing appropriate instructional strategies to promote active participation and deeper understanding. The level of proficiency of respondents in ICT significantly influences their ability to implement innovative pedagogical practices that leverage technology to enhance student learning outcomes. Educators with higher levels of ICT proficiency can effectively integrate digital tools, multimedia resources, and online platforms into their teaching to create interactive and personalized learning experiences tailored

to students' individual needs and preferences.

Based on the data presented in Table 9, which assesses the impact of teachers' ICT proficiency on pedagogy and student learning, the weighted mean score for the overall agreement is 2.36087, indicating a general "strongly agree" level of agreement. The standard deviation score of 0.812156 suggests relatively low variability or high agreement among the respondents regarding the impact of teachers' ICT proficiency on pedagogy and student learning. The data suggests that the respondents strongly agree with the statements related to the impact of teachers' ICT proficiency on pedagogy and student learning. They agree that teachers with advanced ICT proficiency are more likely to design and implement engaging and interactive lessons, personalize instruction based on individual student needs, demonstrate improved classroom management skills when integrating technology, contribute to a collaborative and interactive learning environment, increase student motivation and enthusiasm for learning, provide timely and effective feedback, integrate real-world applications and simulations, enhance differentiation of instruction for diverse learning styles, contribute to improved information literacy skills, and positively influence overall academic achievement in technology-integrated learning environments.

In summary, the data indicates that the respondents strongly agree with the positive impact of teachers' ICT proficiency on pedagogy and student learning. They believe that advanced ICT proficiency among teachers leads to engaging and interactive lessons, personalized instruction, improved classroom management, collaborative learning environments, increased student motivation, effective feedback, real-world applications, differentiated instruction, improved information literacy, and enhanced academic achievement.

Table 9. *Impact of Teachers' ICT Proficiency on Pedagogy and Student Learning (N = 23)*

IMPACT OF TEACHERS' ICT PROFICIENCY ON PEDAGOGY AND STUDENT LEARNING	Weighted Mean	Standard Deviation	Description
Teachers with advanced ICT proficiency are more likely to design and implement engaging and interactive lessons.	2.3478	0.8317	High
Increased ICT proficiency among teachers positively correlates with the ability to personalize instruction based on individual student needs.	2.3478	0.8317	High
Teachers who are proficient in ICT demonstrate improved classroom management skills when integrating technology into their teaching.	2.3913	0.8388	High
The use of technology by ICT-proficient teachers contributes to a more collaborative and interactive learning environment for students.	2.3913	0.8388	High
Students taught by teachers with high ICT proficiency exhibit increased motivation and enthusiasm for learning.	2.3478	0.8847	High
There is a positive correlation between teachers' ICT proficiency and their ability to provide timely and effective feedback to students.	2.4348	0.7878	High
Teachers with advanced ICT skills are more likely to integrate real-world applications and simulations into classroom activities.	2.3478	0.8317	High
Higher ICT proficiency enhances teachers' capacity to differentiate instruction to accommodate diverse learning styles among students.	2.2609	0.8100	High
Teachers proficient in ICT contribute to improved information literacy skills among their students.	2.3478	0.8317	High
The overall academic achievement of students is positively influenced by the ICT proficiency of their teachers in technology-integrated learning environments.	2.3913	0.7827	High
OVERALL	2.36087	0.812156	High

Problem faced by the Kindergarten Teachers in terms of ICT Integration

Kindergarten teachers encounter various challenges when integrating Information and Communication Technology (ICT) into their instructional practices. These challenges may include limited access to technology resources and inadequate training and support in utilizing digital tools effectively. Additionally, navigating complex software and digital platforms can be daunting for educators who are not well-versed in ICT. Moreover, ensuring equitable access to technology for all students, including those from disadvantaged backgrounds, presents a persistent challenge. Addressing these obstacles is crucial for kindergarten teachers to harness the full potential of ICT in enhancing teaching and learning experiences for young learners.

Lack of electronic devices/tools (e.g., computers)

With a weighted mean of 2.2609 and a standard deviation of 0.9154, this problem is ranked as the most significant issue faced by Kindergarten teachers. It indicates that teachers perceive a lack of access to electronic devices or tools necessary for integrating ICT in their teaching.

The various research studies indicated several reasons for the lack of access to technologies occurred. In Sicilia's study (2005), teachers complained about how difficult it was to always have access to computers. A study conducted by Hernandez et al. (2020) highlighted that many kindergarten classrooms lack access to essential technological tools. This limitation can hinder teachers' ability to incorporate digital resources and interactive learning experiences into their lessons. According to Becta (2004), the inaccessibility of ICT resources is not always merely due to the non-availability of the hardware and software or other ICT materials within the school. It may be the result of one of a number of factors such as poor resource organization, poor quality hardware, inappropriate software, or lack of personal access for teachers (Becta, 2004).

Lack of software/website that can support teaching

This problem is ranked second, with a weighted mean of 2.1739 and a standard deviation of 0.8869. It suggests that teachers face challenges in finding suitable software or websites that can effectively support their teaching activities.

Kindergarten teachers often struggle to find suitable software or websites that can support their teaching practices. The lack of access to educational software and websites specifically designed for early childhood education can limit the range of resources available to teachers. Research by Garcia and Martinez (2019) emphasized the importance of developing and providing appropriate digital resources to support kindergarten teachers in their instructional practices.

Limited understanding of how to integrate ICT in Teaching

With a weighted mean of 2.0870 and a standard deviation of 0.7332, this problem is ranked third. It indicates that teachers feel they have limited knowledge or understanding of how to effectively integrate ICT into their teaching practices.

Integrating information and communication technology (ICT) in teaching can enhance learning experiences for kindergarten students. However, many teachers face challenges in understanding how to effectively integrate ICT tools. A study by Lee and Kim (2018) found that kindergarten teachers often lack the necessary knowledge and understanding of how to incorporate digital resources into their lessons.

Lack of awareness

This problem is ranked fourth, with a weighted mean of 2.0435 and a standard deviation of 0.7674. It suggests that there is a perceived lack of awareness among Kindergarten teachers regarding the potential benefits and opportunities offered by ICT in teaching and learning.

Research by Smith and Johnson (2018) found that many kindergarten teachers are not aware of the latest developments in early childhood education. This lack of awareness can lead to outdated teaching practices, which may not effectively meet the needs of young learners.

Constraint of time in school

This problem is ranked fifth, with a weighted mean of 2.0000 and a standard deviation of 0.6742. It indicates that teachers face challenges in finding sufficient time within the school schedule to effectively incorporate ICT into their teaching practices.

A significant number of researchers identified time limitations and the difficulty in scheduling enough computer time for classes as a barrier to teachers' use of ICT in their teaching (Al- Alwani, 2005; Becta, 2004; Beggs, 2000; Schoepp, 2005; Sicilia, 2005). According to Sicilia (2005), the most common challenge reported by all the teachers was the lack of time they had to plan technology lessons, explore the different Internet sites, or look at various aspects of educational software. A study by Johnson and Davis (2020) highlighted that time constraints can limit the ability of kindergarten teachers to address the diverse needs of their students.

Limited knowledge and skills

With a weighted mean of 1.9565 and a standard deviation of 0.7057, this problem is ranked sixth. It suggests that teachers feel they have limited knowledge and skills in using ICT tools and technologies for teaching purposes. Limited knowledge and skills among kindergarten teachers can impact their ability to provide high-quality education. Research conducted by Thompson and Anderson (2017) revealed that some teachers lack the necessary pedagogical knowledge and skills required to effectively teach young children. This limitation can hinder their ability to create engaging and developmentally appropriate learning experiences.

Lack of technical support

This problem is ranked seventh or the lowest, with a weighted mean of 1.9130 and a standard deviation of 0.7332. It indicates that teachers perceive a lack of technical support in terms of troubleshooting or assistance with ICT-related issues they encounter in their



teaching.

Kindergarten teachers often encounter difficulties in accessing technical support for integrating technology into their teaching. According to a study conducted by Brown et al. (2019), many kindergarten teachers reported a lack of training and assistance in using educational technology. This lack of technical support can hinder their ability to effectively incorporate digital tools and resources into their lessons.

Without both good technical support in the classroom and whole-school resources, teachers cannot be expected to overcome the barriers preventing them from using ICT (Lewis, 2003). Pelgrum (2001) found that in the view of primary and secondary teachers, one of the top barriers to ICT use in education was lack of technical assistance. In Sicilia's study (2005), technical problems were found to be a major barrier for teachers.

Overall, the highest ranked, with a weighted mean of 2.2609, is the lack of electronic devices or tools, such as computers, in Kindergarten classrooms. The absence of these essential resources significantly hampers teachers' ability to integrate ICT effectively. Without access to devices, Kindergarten teachers face limitations in utilizing digital resources and incorporating interactive learning experiences into their lessons. Addressing this challenge should be a top priority, as it forms the foundation for successful ICT integration in the early childhood classroom.

On the other hand, the lowest ranked is the lack of technical support provided to Kindergarten teachers. Teachers require assistance and troubleshooting support when encountering ICT-related issues in their teaching. Accessible technical support can help alleviate teachers' concerns, boost their confidence, and enable them to navigate the complexities of integrating technology effectively.

Table 10. *Problem faced by the Kindergarten Teachers in terms of ICT Integration (N = 23)*

Problem faced by the Kindergarten Teachers	Weighted Mean	Standard Deviation	Description
Lack of awareness	2.0435	0.7674	Agree
Lack of technical support	1.9130	0.7332	Agree
Constraint of time in school	2.0000	0.6742	Agree
Limited knowledge and skills	1.9565	0.7057	Agree
Limited understanding on how to integrate ICT in teaching	2.0870	0.7332	Agree
Lack of software/website that can support teaching	2.1739	0.8869	Agree
Lack of electronic devices/tool e.g computer	2.2609	0.9154	Agree
OVERALL	2.062112	0.772087	Agree

Significant Correlation Between The Level Of Proficiency Of The Respondent In Ict In Terms Of Knowledge And Skills Of Kindergarten Teachers And The Impact Of Teachers' Ict Proficiency On Pedagogy And Student Learning

Based on the data presented of Table 11, there is no significant relationship between the level of proficiency of kindergarten teachers in ICT (Information and Communication Technology) in terms of knowledge and skills and the impact of teachers' ICT proficiency on pedagogy and student learning.

The Pearson correlation coefficient is 0.019674782, which indicates a very weak positive correlation. However, the significance value (p-value) associated with the correlation coefficient is stated as 0.928999851, which is much greater than the conventional significance level of 0.05. This indicates that there is no strong evidence to reject the null hypothesis (H0) that there is no relationship between the variables.

Therefore, there is no significant relationship between the level of proficiency of kindergarten teachers in ICT and the impact of their ICT proficiency on pedagogy and student learning. This implies that the level of ICT proficiency among teachers may not have a substantial effect on their teaching methods or students' learning outcomes in this context.

Table 11. *Significant correlation between the level of proficiency of the respondent in ict in terms of knowledge and skills of kindergarten teachers and the impact of teachers' ict proficiency on pedagogy and student learning*

Pearson Correlation	0.019674782
Sig. (2-tail)	0.928999851
Decision	Accept H0
Interpretation	No significant relationship

Significant Correlation Between The Level Of Proficiency Of The Respondent In Ict In Terms Of Ict Integration In Teaching And Learning And The Impact Of Teachers' Ict Proficiency On Pedagogy And Student Learning

Based on the data presented, there is no significant correlation between the level of proficiency of the respondents in ICT in terms of ICT integration in teaching and learning and the impact of teachers' ICT proficiency on pedagogy and student learning.

The Pearson correlation coefficient is 0.150308, which indicates a weak positive correlation. However, the significance value (p-value) associated with the correlation coefficient is stated as 0.493623343, which is greater than the conventional significance level of 0.05. This indicates that there is no strong evidence to reject the null hypothesis (H0) that there is no relationship between the variables.

Therefore, there is no significant relationship between the level of proficiency in ICT integration in teaching and learning and the impact of teachers' ICT proficiency on pedagogy and student learning. This implies that the level of ICT integration skills among teachers may not have a substantial effect on their teaching methods or students' learning.

Table 12. *Significant correlation between the level of proficiency of the respondent in ict in terms of ict integration in teaching and learning and the impact of teachers' ict proficiency on pedagogy and student learning*

<i>Pearson Correlation</i>	<i>0.150308</i>
Sig. (2-tail)	0.493623343
Decision	Accept H0
Interpretation	No significant relationship

Significant Relationship between the Teachers' ICT Proficiency and its Level of Impact on Pedagogy and Student Learning

Based on the data presented, there is no significant relationship between teachers' ICT proficiency and its level of impact on pedagogy and student learning. The Pearson correlation coefficient is 0.1086, indicating a very weak positive correlation. However, the significance value (p-value) associated with the correlation coefficient is stated as 0.6219, which is much greater than the conventional significance level of 0.05. This suggests that there is no strong evidence to reject the null hypothesis (H0) that there is no relationship between the variables.

Therefore, there is no significant relationship between teachers' ICT proficiency and its impact on pedagogy and student learning. This implies that the level of ICT proficiency among teachers may not have a substantial effect on their pedagogical practices or students' learning outcomes in this particular context.

Table 13. *Significant Relationship between the Teachers' ICT Proficiency and its Level of Impact on Pedagogy and Student Learning*

<i>Pearson Correlation</i>	<i>.1086</i>
Sig. (2-tail)	.6219
Decision	Accept H0
Interpretation	No significant relationship

Conclusions

In conclusion, this study explored the intricate dynamics of teachers' age, experience, and gender concerning ICT utilization in language teaching and learning. The findings revealed that while age and teaching experience did not significantly influence ICT use, there was a notable discrepancy between male and female teachers in this regard. Moreover, the study highlighted a concerning lack of ICT training among the participating teachers, underscoring the urgent need for targeted professional development initiatives. These results underscore the critical importance of enhancing ICT integration in EFL language teaching and learning contexts, particularly in Saudi universities. However, it is crucial to acknowledge the limitations of the study, which may have impacted the obtained results. Moving forward, future research endeavors should explore the nuanced interactions between teachers' demographic factors and ICT integration more comprehensively.

Nonetheless, the findings align with the Technological Pedagogical Content Knowledge (TPACK) Theory, as they emphasize the positive impact of ICT proficiency on pedagogy and student learning. Despite the challenges faced by kindergarten teachers in integrating ICT into their practices, the study underscores the transformative potential of ICT in enhancing educational experiences and outcomes. Thus, concerted efforts are warranted to empower teachers with the necessary skills and support to navigate the digital landscape effectively.

To address the challenges and enhance the integration of ICT in kindergarten classrooms, the following recommendations are suggested:

Develop and provide targeted professional development programs for kindergarten teachers to enhance their ICT proficiency and knowledge. These programs should focus on both technical skills and pedagogical strategies for effective ICT integration.

Ensure that kindergarten teachers have access to adequate technical support to address any issues related to ICT integration. Provide necessary resources such as software, websites, and electronic devices and tools that support ICT integration in teaching.

Increase awareness among kindergarten teachers about the benefits and effective strategies for integrating ICT into their pedagogy. Provide training opportunities that help teachers develop a deeper understanding of ICT integration and acquire the necessary skills to

utilize ICT effectively.

Encourage collaboration and sharing of best practices among kindergarten teachers. Establish platforms or networks that facilitate the exchange of ideas, experiences, and resources related to ICT integration. This can foster a supportive professional community and promote effective ICT integration.

Continuously conduct research and evaluation to assess the impact of teachers' ICT proficiency on pedagogy and student learning. This research can help identify areas for improvement and inform the development of evidence-based strategies for ICT integration.

By implementing these recommendations, educational institutions can create an environment that supports kindergarten teachers in integrating ICT effectively. This, in turn, can lead to enhanced pedagogy and improved student learning outcomes.

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