Teachers Competence and Utilization of ICT in the Educational System of Beijing

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Abstract:

Teachers are at the heart of the education system and therefore have an important role in integrating ICT into teaching and learning. This study was conducted to determine the Teachers level of competence and extent of utilization of ICT in the Educational System of Beijing, China for the School Year 2023-2024. The study utilized descriptive research design. A validated and reliability-tested self-made questionnaire was used to gather baseline data from 108 sampled respondents. The teacher's levels of competence in ICT were all high level and their extents of compliance were all great extent. There was no significant difference in the teacher's level of competence and extent of compliance in ICT when grouped and compared according to the variables, age, sex, civil status and highest educational attainment. This study calls for persons in authority that can contribute to creating an enabling environment that empowers teachers to effectively leverage ICT for enhanced teaching and learning outcomes.

Keywords: Teachers competence, utilization of ICT, educational system, facilities and equipment, productivity applications, online platforms

Introduction:

Nature of the Problem

In this digital era, the use of Information and Communications Technology (ICT) in education is gaining a higher momentum as school systems increase its usage and double its investments. Proven to be effective in academic use, the rapid development of ICT has induced the rise of new generation of learners with a very unique way of receiving, processing and exchanges of information (Wang, 2023).

The competence of teachers in the ICT sector is a worldwide concern as well as that of many other professionals. Examples include teachers' skills in the use of ICT administration, preparation for teaching, proficiency in ICT tools, and ICT literacy. Teachers are at the heart of the education system and therefore have an important role in integrating ICT into teaching and learning (Tekya & Asare, 2016).

ICT literacy is basic competence for teachers in utilizing ICT to prepare students in order to be able to master new technology as equipment for them in developing themselves as long life learner. This stage focus on technology literacy development in teachers to integrate ICT tool. Teachers' competence and understanding need skill, behavior and professional value. It means that teachers' competence can comprise fact and concept repetition until advance motor skill toward learning behavior and professional value, that competence is one's unique characteristic and the way of behave and thinking in every situation which is affected on their ability to use tool and facility in workplace. From this opinion, competence refer to one's performance in a job which can be seen from thinking, attitude and behavior (Ikemba, 2018).

Tenured teachers experienced difficulty with regard to their competence and utilization because of resistance to adopting new technologies, fear of technology replacing jobs or reluctance to learn new skills. With this, the researcher is motivated to look into the different factors to improve maximum utilization of ICT in the Educational System of China..

Current State of Knowledge

The competence of teachers in the ICT sector is a worldwide concern as well as that of many other professionals. Examples include teachers' skills in the use of ICT administration, preparation for teaching, proficiency in ICT tools, and ICT literacy. Teachers are at the heart of the education system and therefore have an important role in integrating ICT into teaching and learning (Tekya & Asare, 2016). According to Bhattacharjee and Deb (2016), teachers must be able to structure their learning environment in non-traditional ways in order to

successfully integrate ICT into teaching and learning. As a result, teachers who are inexperienced with technology will limit their creativity and confidence when using it in the classroom. In addition, teachers' ability to integrate technology into classroom activities and appreciate the versatility of technology as an important teaching and learning tool depends on their knowledge and ability to apply ICT on their own (Kamaruddin, Abdulla, Idris, and Nawi, 2017). This means that building teachers' capacity for ICT literacy, as well as an ongoing practice, is essential for effectively integrating ICT in the classroom. Teachers must be prepared to use technology in providing essential knowledge as the world becomes increasingly digital and virtual classrooms become more pervasive.
Technology operations competency will help teachers demonstrate knowledge, skills, and understanding of concepts related to technology, such as the technology systems, resources, and services that are at a pace to 21st-century learners (Tooker, 2020). Technology operations competency provides teachers with the ongoing support and education that is necessary to continue positive technological growth in the classroom. Technology operations competency is vital for teachers in their teaching and learning process, as it facilitates effective learning (Thakur, 2015). It further emphasizes that it improves the students for further development and attainment of learning outcomes and maintains the context of designing classroom-based resources with the application of ICT. Thus, acquiring knowledge and competence in technology operations and concepts skills is important to teachers.

Lack of pedagogic training in how to use ICT in the classroom and lack of training concerning the use of technologies in specific areas were obstacles to using new technologies in classroom practice. The rapid development of tools and resources presents both opportunities and challenges. In order to maximize the potential of ICT teaching, it is crucial that it is used in a pedagogically sound way that corresponds to the individual needs of learners. It is also important that the use of ICT is introduced and supported in a sustainable way and in a range of pedagogical approaches that promote lifelong learning. Clearly it is important to analyze the challenges of the use of ICT in the teaching and learning (Dondofema and Shumba, 2018).

Equipped with the suitable ICT competence, teachers will be in the best position to intensify ICT awareness of their students for them to reap the benefits of the process. To ensure the success of computer education, both teachers and students should observe the key roles they need to play in the teaching-learning process. Therefore, teachers and students' competency in analyzing, designing, developing, educating, applying, evaluating and controlling ICT is highly significant in education (Guillo, Jr., 2017).

ICT literacy is basic competence for teachers in utilizing ICT to prepare students in order to be able to master new technology as equipment for them in developing themselves as long life learner. This stage focus on technology literacy development in teachers to integrate ICT tool. Teachers' competence and understanding need skill, behavior and professional value. It means that teachers' competence can comprise fact and concept repetition until advance motor skill toward learning behavior and professional value, that competence is one's unique characteristic and the way of behave and thinking in every situation which is effected on their ability to use tool and facility in workplace. From this opinion, competence refers to one's performance in a job which can be seen from thinking, attitude and behavior (Ikemba, 2018).

Meanwhile, teachers play the role as a medium between the students with technology, as the driving force in creating an ICT literate's society. As educators in schools, it is necessary for teachers to prepare and update all the facts to be presented in subjects using ICT facilities available in schools. The use of ICT in teaching and learning can make a subject as enjoyable event for all students, even the teacher themselves also gain experience and knowledge while interacting with students. The level of competence and knowledge of ICT skills among teachers is different in view of digital technology that exists is varied and wide scope. Some educators are quick to master the knowledge and technology skills that exist while there are also educators who are still trying to master the most basic technology such as email, students file management system, internet and office productivity software (Yieng, 2018).
Being prepared to use technology and knowing how that technology can support student learning have become integral skills in every teacher's professional repertoire. Digital technology is constantly defining society in the present world, where the digitalization of organizations is progressing from being innovative to being part of their basic activities (Treceñe, 2021). In this changing educational landscape, many students enter further and higher education without the necessary abilities to utilize digital technology to education (Gallardo-Echenique, 2015). Thus, educators should recognize that 21st-century learners should be equipped with the necessary skills and experience that will enable them to contribute to the growing global community. Classroom teachers must be prepared to present students with technology-enhanced learning possibilities. Being ready to use technology and understanding how technology may help students learn have become essential skills in any teacher's professional arsenal. Teachers who have access to technology resources and abilities can successfully teach subject matter while integrating technological concepts and skills (Batan et al., 2022).

The Philippine Government has shown serious commitment to ICT in education by announcing a series of initiatives to apply ICT in teaching and learning. These were aligned to the Millennium Development Goals and the Education For All movements. They have provided a global policy environment for the directions and nature of interventions towards the achievement of improved access to and quality of basic education. Other key policy

documents have identified the need for ICT reform within the education sector and these have resulted in more prioritizing from regions, schools and teachers regarding the incorporation of ICT into the education system (Caluza et al, 2017).

In an era where adapting to new trends in education is essential, the learned skills of teachers are crucial. Trainings, workshops, seminars, and personal experiences can help teachers provide quality education despite the challenges they face. These learned skills, such as computer literacy, can be applied to solve existing problems. With the collaborative efforts of school administrators and teachers who possess these skills, quality education is achievable (Mula and Bucar, 2023).

According to Tuazon (2019) teachers with sufficient ICT training and graduate or postgraduate studies were able to effectively utilize the equipment provided by the program. This suggests that the effectiveness of technology-related programs such as the Department of Education Computerization Program depends on adequate preparation and training for teachers, as well as personal experience in using technology. Okan (2016) suggests that developing computer skills is necessary for learners to succeed in their academic and career pursuits. This indicates that being literate in the use of technology can have a significant impact on learners. These studies show that not only do school administrators need meaningful and in-depth training, but teachers and learners also require such training. This aligns with the department's goal of providing quality education as mandated by the constitution.

Meanwhile, Pedagogical competence refers to the use of technology in teaching-learning process such as planning and designing effective learning environments and experiences supported by technology; implementing, facilitating, monitoring teaching and learning strategies that integrate a range of information and communication technologies to promote and enhance student learning; and assessing and evaluating student learning and performances. (Caluza et al., 2017). Teachers must skillfully apply technology to develop students' higher-order thinking skills and creativity. They must adequately provide performance tasks that require students to locate and analyze information and to use a variety of media to communicate results. They must also competently conduct open and flexible learning environments where technology is used to support a variety of interactions among students, cooperative learning, and peer instruction. They must sufficiently apply technology to facilitate a variety of appropriate assessment and evaluation strategies recognizing the diversity of learner (Arnaiz, 2018).
Pedagogical ICT competence is linked to teachers' instructional practices and curricular knowledge, and they challenge them to create applications within their disciplines that use ICT to support and enhance teaching and learning. According to Amusan (2016), the teacher's pedagogical skills are a powerful force. Because teachers are the visible faces of education, they are frequently the obvious scapegoats in situations where a learner is underperforming.

According to Arnaiz, (2018) ICT professional competency basically engage in exploring and learning new and emerging technologies. They should evaluate and reflect on the use of technology in the profession for development and innovation and partly share experiences and expertise, and halfway collaborate with peers and stakeholders in advancing the use of technology in education and beyond. Teachers must understand and observed legal practices in the use of technology. They must also recognize and practiced ethical use of technology in both personal and professional levels, appropriately planned, modelled and promoted safe and sound technology-supported learning environment and facilitated equitable access to technology that addresses learning, social and cultural diversity (Arnaiz, 2018).

Theoretical Underpinnings

This study is anchored on the Unified Theory of Acceptance and Use of Technology by Venkatesh, Moris, Davis, and Davis (2003).

The unified Theory of Acceptance and Use of Technology is based on the user's perception of usefulness and the perceived ease of use as cited by Sharples and Modules (2014). The theory has been used widely by researchers in the field of technology in education with various modifications as well as criticism. The perceived usefulness of technology relates to the conviction among users such as teachers that it will make their work, thus enhancing job performance (Muinde & Mbataru, 2019). This means that if teachers think that the use of computers would make their day-to-day activities such as the preparation of lesson plans, lesson materials, or analyses of students' results more organized and accurate, then they would probably use them. The perceived ease of use of new or existing technology would mean that the users view technology as one that does not require a lot of effort to learn how to use it (Venkatesh et al., 2003). This suggests that teachers would possibly adopt technology that they consider easy to learn and use with minimal need for expert consultation.

Relating this theory to this study, it is understood that apart from globalization, technology acceptance, and usage these days provide comfort and ease for users – particularly for learners and teachers. If the teacher used to carry voluminous files before, during, and after exams, nowadays, files can be easily compacted, and saved in the

cloud or a thin disk – all without going through the usual discomfort and unease. Using the digital platform, information processing, and exchanging can be done in real-time in split seconds. The theory is very useful in understanding why older teachers are less likely to utilize ICT in the classroom versus the younger teachers who may not really be tech-savvy but has a positive outlook on technology use in school. This theory will also help people understand why there are learners on their own gets easy access to the internet and digital platforms with or without the guidance of the teachers. The technology acceptance theory speaks of modern adaptations our system of education has to adopt, otherwise, learning stops where people ceased to be adept with technology.

Objectives

This study aimed to determine the Teachers level of competence and extent of utilization of ICT in the Educational System of Beijing, China for the School Year 2023-2024. Specifically, this study sought answers to the following questions: 1) the profile of the respondents in terms of age, sex, civil status and highest educational attainment; 2) the teacher's level of competence in ICT according to the area of facilities and equipment, productivity applications, and online platforms; 3) the teacher's extent of utilization of ICT according to the aforementioned areas; 4) there a significant difference in the teacher's level of competence in ICT when grouped and compared according to the aforementioned variables; and 5) there a significant difference in the teacher's extent of utilization of ICT when grouped and compared according to the aforementioned variables.

Methodology

This section describes the research design, the locale of the study, respondents, the research instrument's validity and reliability the instrument, data gathering procedure and data analysis, and the statistical tools used.

Research Design

This study utilized the descriptive research design, which is believed to be appropriate in measuring the teacher's level of competence and utilization in ICT according to the areas, Facilities and Equipment, Productivity Applications and Online Platforms and whether a significant difference exist in the in the teacher's level of competence and extent of compliance in ICT when grouped and compared according to the variables, age, sex, civil status and highest educational attainment. Descriptive research design is a scientific method design that entails watching and documenting a subject's behavior without exerting any influence over it (Bueno, 2016). To effectively portray or account for the qualities of a particular person, descriptive research involves accurately and methodically describing the facts and features of a specified population or area of interest (Siedlecki, 2020). This method is the most appropriate method to use in this study..

Study Respondents

The study's respondents were 108 teachers from a total of population of 148. Since the number of respondents is quite large, stratified sampling and random sampling techniques were used, and the Cochran formula was used to find the sample size. To get the percentage, the respondents coming from each department were divided by the total number of respondents and multiplied by the sample size. The researcher randomly selected the respondents from each department using the lottery technique.

Instruments

A survey questionnaire was used in gathering the data to determine the teacher's level of competence and extent of compliance in ICT were it was subjected to validity (4.44=excellent) and reliability (0.753= acceptable) for competence and (0.755=acceptable) for compliance. The questionnaire was divided into two parts wherein part I deals with the profile of respondents in terms of age, sex, civil status and highest educational attainment. Part 2 contained the questionnaire proper consisting of 45 items. There were 15 items for competence, and another 15 line items for compliance, which means there were 5 line items per area. The respondents were asked to rate each item using the five-point Likert scale, which contains the following scores: 5 – Always; 4 – Often; 3 – Sometimes; 2 – Rarely; and 1 – Almost Never.

Procedure

Data Collection

After establishing the validity and reliability of the instrument, the researcher wrote a letter to the School Director to ask permission to conduct the study.

In the conduct, the researcher explained the purpose of the study, personally administered the questionnaire to the respondents, and guided them carefully in answering and giving the needed data and retrieving the

questionnaires. The respondents were assured of the confidentiality of the data gathered. The raw data were transformed into numerical code guided by a coding manual. This allowed computer processing, statistical derivations, and tabular presentation. The Statistical Package for Social Sciences (SPSS) was used in the computer processing of the encoded data with the help of the by the statistician assigned to solve the problem with answers and come up with a valid conclusion

Data Analysis and Statistical Treatment

Objective No 1 used descriptive analytical scheme and frequency and percentage to determine the profile of the respondents in terms of age, sex, civil status and highest educational attainment; Objective No. 2 used descriptive analytical scheme and mean to determine teachers' level of competence on ICT according to the areas, facilities and equipment, productivity applications and online platforms; Objective No. 3 used descriptive analytical scheme and mean to determine the extent of utilization of ICT according to the aforementioned areas; Objective No. 4 utilized comparative analytical scheme and Mann Whitney U test to determine the significant difference in the level of teachers' competence on ICT when grouped and compared according to the aforementioned variables; and Objective No.5 utilized comparative analytical scheme and Mann Whitney U test to determine the significant difference in the teacher's extent of utilization of ICT when grouped and compared according to the aforementioned variables.

Ethical Consideration

The researcher ensures that respondents were given the free will to be involved in the study, their identity was not disclosed and they were assured of the confidentiality of the data gathered. After completion, all data stored in electronic gadgets were discarded in order to protect against unauthorized access or use of information.

This research paper strived in earnest to minimize the risk of harm to its target respondents by assuring them of the confidentiality of their responses and protecting their anonymity throughout the entire research process. At the onset, this researcher secured their free, prior informed consent and assured them of their right to withdraw from their research participation if deemed necessary.

Results and Discussion

This section presents, analyzes, and interprets the data that were gathered consistent with its predetermined objectives.

Table 1
Profile of Respondents

Variables	Categories	Frequency	Percentage
Age	Younger (below 28 years old)	53	49.10
	Older (28 years old and above)	55	50.90
	Total	**108**	**100**
Sex	Male	45	41.7
	Female	63	58.3
	Total	**108**	**100**
Civil Status	Single	76	70.4
	Married	32	29.6
	Total	**108**	**100**
Highest Educational Attainment	Lower (Bachelor's Degree)	51	47.20
	Higher (Masters and Doctoral Degree)	57	52.80
	Total	**108**	**100**

The first objective of the study is to determine the profile of the teachers in terms of the variables age, sex, civil status and highest educational attainment. As shown in Table 1, most of the teachers belong to the older group who are 28 years old and above. Females dominate the respondents, accounting for 58.30%, while males constitute 41.70%. Most of the teachers were single comprising 70.40%. In addition, most of them were in a higher educational attainment.

This implies that the organization has a relatively balanced age distribution, with a slight majority of older individuals. The gender distribution indicates a significant imbalance, with a higher proportion of females.

Table 2
Teacher's Level of Competence in ICT According to the Area Facilities and Equipment

Items	Mean	Interpretation
As a teacher, I am competent in...		
1. operating computers, tablets, printers and other gadgets in teaching.	4.00	High Level
2. delivering lessons using multimedia content tools.	4.06	High Level
3. teaching students using robotics kits.	4.00	High Level
4. using interactive whiteboards and smart boards in teaching.	4.08	High Level
5. utilizing audio visual tools.	3.95	High Level
Overall Mean	**4.02**	**High Level**

The teacher's level of competence in ICT in the area Facilities and Equipment in general was 4.02 which is interpreted as high level. Item 4, "using interactive whiteboards and smart boards in teaching." obtained the highest mean of 4.08 interpreted as high level, while item 5, "utilizing audio visual tools." got the lowest mean of 3.95 interpreted as high level.

This implies that while teachers generally exhibit a high level of competence in utilizing audio visual tools, this aspect of their ICT skills might be slightly lower compared to their competence in other areas such as operating computers, delivering lessons using multimedia content tools, teaching with robotics kits, and using interactive whiteboards and smart boards. This implies that there might be room for improvement or further training in this specific area to enhance teachers' proficiency in utilizing audio visual tools effectively in teaching.

This finding aligns with the notion that integrating audio visual tools in teaching can sometimes pose challenges for educators. While technology offers vast opportunities for enhancing learning experiences, its effective utilization requires not only access to resources but also pedagogical skills to integrate them seamlessly into instruction (Kim & Yildirim, 2020). Studies have shown that teachers may encounter barriers such as technical issues, lack of training, or limited access to appropriate resources when incorporating audio visual tools in their teaching practices (Al-Zahrani, 2017). Therefore, addressing these challenges through targeted professional development programs and providing adequate support could help educators improve their competence in utilizing audio visual tools effectively.

Table 3
Teacher's Level of Competence in ICT According to the Area Productivity Applications

Items	Mean	Interpretation
As a teacher, I am competent in...		
1. preparing visual aids using graphics software	3.91	High Level
2. using Microsoft Office applications.	4.02	High Level
3. utilizing other resources available in safe networks and websites.	3.96	High Level
4. note-taking and organizational applications.	4.11	High Level
5. storing and analyzing data using database management software.	3.96	High Level
Overall Mean	**3.99**	**High Level**

The teacher's level of competence in ICT in the area Productivity Applications in general was 3.99 which is interpreted as high level. Item 4, "note-taking and organizational applications." obtained the highest mean of 4.11 interpreted as high level, while item 1, "preparing visual aids using graphics software." got the lowest mean of 3.91 interpreted as high level.

This implies that while teachers generally demonstrate a high level of competence in preparing visual aids using graphics software, this aspect of their ICT skills might be slightly lower compared to their proficiency in other productivity applications. This suggests that while teachers possess the basic skills necessary to utilize graphics software for preparing visual aids, there may be opportunities for further enhancement and development in this area to optimize the use of graphics software in educational contexts.

While the mean score for this item suggests a high level of competence overall, it is essential to recognize the potential benefits of providing targeted professional development opportunities focused on enhancing teachers' skills in utilizing graphics software for instructional purposes. By investing in training programs that offer practical guidance and support in creating visually compelling educational materials, educational stakeholders can empower teachers to leverage graphics software more effectively, ultimately enhancing the quality of teaching and learning experiences.

The finding regarding teachers' competence in preparing visual aids using graphics software aligns with previous research highlighting the importance of multimedia tools in enhancing instructional materials and engaging learners (Mayer, 2014). Graphics software provides educators with the ability to create visually appealing and interactive materials that can facilitate comprehension and retention of content. However, studies have also identified challenges associated with the effective use of graphics software in educational settings, including limited training opportunities and time constraints (Agyei & Voogt, 2011).

Table 4
Teacher's Level of Competence in ICT According to the Area Online Platforms

Items	Mean	Interpretation
As a teacher, I am competent in…		
1. utilizing social learning platforms for peer interaction and collaboration.	3.89	High Level
2. accessing educational resources and e-books.	4.02	High Level
3. using virtual reality platforms for immersive learning experience.	4.03	High Level
4. utilizing gamification platforms for engaging and interactive learning experience.	4.05	High Level
5. employing data analytics for tracking student progress and performance.	3.86	High Level
Overall Mean	**3.97**	**High Level**

The teacher's level of competence in ICT in the area Online Platforms in general was 3.97 which is interpreted as high level. Item 4, "utilizing gamification platforms for engaging and interactive learning experience." obtained the highest mean of 4.05 interpreted as high level, while item 5, "employing data analytics for tracking student progress and performance." got the lowest mean of 3.86 interpreted as high level.

The result implies that while teachers generally demonstrate a high level of competence in utilizing online platforms for various purposes, their proficiency in employing data analytics for tracking student progress and performance may be slightly lower compared to other aspects of online platform utilization. This indicates that while educators have some familiarity with data analytics tools, there may be opportunities for further development and training to fully leverage the potential of data-driven approaches for monitoring and enhancing student learning outcomes.

The finding regarding teachers' competence in employing data analytics aligns with existing research highlighting both the potential benefits and challenges associated with the use of data-driven approaches in education (Nasir & Zaman, 2020). While data analytics offer valuable insights into student progress and performance, educators may face barriers such as limited access to appropriate tools, insufficient training, and concerns about data privacy and security (OECD, 2019).

Studies have emphasized the importance of providing educators with the necessary support and training to effectively utilize data analytics tools for informing instructional decision-making and personalized learning interventions (Van den Akker et al., 2019). By empowering teachers to harness the power of data analytics, educational institutions can promote evidence-based practices and facilitate continuous improvement in teaching and learning processes.

Furthermore, research suggests that integrating data analytics into educational practices can enhance educators' ability to identify at-risk students, personalize instruction, and optimize learning experiences (Laurillard, 2012). Therefore, investing in professional development programs that offer practical guidance and resources in data analytics can help educators unlock the full potential of this technology to support student success.

Table 5
Teacher's Extent of Utilization in ICT According to the Area Facilities and Equipment

Items	Mean	Interpretation
As a teacher, I am utilizing …		
1. computers, tablets and other gadgets in teaching.	3.95	Great Extent
2. interactive whiteboards or smart boards in delivering lessons.	4.00	Great Extent
3. projectors and screens for multimedia presentations.	3.91	Great Extent
4. audio visual equipment for recording and multimedia content.	3.89	Great Extent
5. virtual reality or augmented reality devices for immersive learning experience.	4.12	Great Extent
Overall Mean	**3.97**	**Great Extent**

The teacher's extent of compliance in ICT in the area Facilities and Equipment in general was 3.97 which is interpreted as great extent. Item 5, "virtual reality or augmented reality devices for immersive learning experience." obtained the highest mean of 4.12 interpreted as great extent, while item 4, "audio visual equipment for recording and multimedia content." got the lowest mean of 3.89 interpreted as great extent.

This implies that while teachers generally utilize audio visual equipment for recording and multimedia content to a great extent, their extent of utilization in this area is slightly lower compared to other aspects of facilities and equipment. This implies that while educators are actively incorporating audio visual equipment into their teaching practices, there may be opportunities for further enhancement and exploration of the potential benefits of these tools for creating multimedia-rich learning experiences.

By addressing the potential challenges identified in this study and offering targeted professional development opportunities, educational institutions can empower teachers to maximize the educational benefits of audio-visual equipment for recording and multimedia content creation, ultimately enhancing the quality and effectiveness of teaching and learning experiences.

The finding regarding teachers' extent of utilization of audio-visual equipment for recording and multimedia content aligns with previous research highlighting the growing importance of multimedia resources in educational settings (Mishra & Koehler, 2016). Audio visual equipment offers educators the ability to create dynamic and interactive learning materials that cater to diverse learning styles and promote student engagement (Westera et al., 2017). However, studies have also identified challenges associated with the effective integration of audio-visual tools into instructional practices, including technical issues, time constraints, and lack of training (Jamet & Lecoq, 2012).

Research suggests that providing educators with training and support in utilizing audio visual equipment can enhance their confidence and proficiency in leveraging these tools to enrich teaching and learning experiences (Hofer & Grandgenett, 2012). Additionally, collaborative approaches that encourage teachers to share best practices and innovative strategies for utilizing audio visual tools can foster a culture of continuous improvement and experimentation in educational contexts (Koehler & Mishra, 2019).

Table 6
Teacher's Extent of Utilization in ICT According to the Area Productivity Applications

Items	Mean	Interpretation
As a teacher, I am utilizing …		
1. collaboration tools and platforms.	4.10	Great Extent
2. learning management system.	3.95	Great Extent
3. video editing software for multimedia projects.	4.01	Great Extent
4. project management software for assignments and group projects.	3.90	Great Extent
5. communication and messaging platforms for-student-teacher interaction.	3.94	Great Extent
Overall Mean	**3.98**	**Great Extent**

The teacher's extent of compliance in ICT in the area Productivity Applications in general was 3.98 which is interpreted as great extent. Item 1, "collaboration tools and platforms." obtained the highest mean of 4.10 interpreted as great extent, while item 4, "project management software for assignments and group projects." got the lowest mean of 3.90 interpreted as great extent.

This implies that while teachers generally utilize project management software for assignments and group projects to a great extent, their extent of utilization in this area is slightly lower compared to other productivity applications. This indicates that while educators are actively incorporating project management software into their teaching practices, there may be opportunities for further exploration and enhancement of the use of these tools to facilitate effective organization and coordination of assignments and group projects.

The finding regarding teachers' extent of utilization of project management software for assignments and group projects aligns with existing research emphasizing the importance of effective project management practices in educational contexts (Zhang et al., 2017). Project management software offers educators the ability to streamline workflows, allocate tasks, and monitor progress, thereby enhancing collaboration and productivity among students (Larson & Gray, 2018). However, studies have also identified challenges associated with the implementation of project management software in educational settings, including integration issues, user resistance, and the need for training and support (Cohen & Bailey, 2014).

Research suggests that providing educators with training and resources in project management techniques and software tools can enhance their ability to effectively utilize these tools to facilitate student-centered learning experiences (Zheng et al., 2020). Additionally, fostering a collaborative culture among educators and students can encourage the adoption and sustained use of project management software for assignments and group projects (Cao et al., 2018).

By addressing the potential challenges identified in this study and providing targeted support and resources, educational institutions can empower teachers to maximize the educational benefits of project management software for assignments and group projects, ultimately enhancing the quality and effectiveness of teaching and learning experiences.

Table 7
Teacher's Extent of Utilization in ICT According to the Area Online Platforms

Items	Mean	Interpretation
As a teacher, I am utilizing …		
1. digital library platforms for research.	3.97	Great Extent
2. social learning platforms for peer interaction and collaboration.	3.92	Great Extent
3. online assessment and examination platforms.	4.01	Great Extent
4. video conferencing platforms form online lectures and discussions.	4.12	Great Extent

5. virtual classroom platforms for real-time interactive teaching and learning.	4.12	Great Extent
Overall Mean	**4.03**	**Great Extent**

The teacher's extent of compliance in ICT in the area Online Platforms in general was 4.03 which is interpreted as great extent. Item 4, "video conferencing platforms form online lectures and discussions." and item 5 "virtual classroom platforms for real-time interactive teaching and learning" obtained the highest mean of 4.12 interpreted as great extent, while item 2, "social learning platforms for peer interaction and collaboration." got the lowest mean of 3.92 interpreted as great extent.

This implies that while teachers generally utilize social learning platforms for peer interaction and collaboration to a great extent, their extent of utilization in this area is slightly lower compared to other online platforms. This implies that while educators are actively incorporating social learning platforms into their teaching practices, there may be opportunities for further exploration and enhancement of these tools to foster more effective peer interaction and collaboration among students.

By addressing the potential challenges identified in this study and providing targeted support and resources, educational institutions can empower teachers to maximize the educational benefits of social learning platforms for peer interaction and collaboration, ultimately enhancing student engagement, collaboration, and learning outcomes.

The finding regarding teachers' extent of utilization of social learning platforms for peer interaction and collaboration aligns with existing research emphasizing the potential benefits and challenges associated with social technologies in education (Kaplan & Haenlein, 2016). Social learning platforms offer educators the opportunity to facilitate collaborative learning experiences, promote peer interaction, and support knowledge sharing among students (Veletsianos & Kimmons, 2012). However, studies have also identified barriers to effective implementation, including concerns about privacy, digital literacy, and the need for clear guidelines and support structures (Junco et al., 2011).

Research suggests that providing educators with training and resources in leveraging social learning platforms can enhance their ability to create engaging and interactive learning environments (Akkerman & Bakker, 2011). Additionally, fostering a culture of collaboration and community building among students can promote the meaningful use of social technologies for learning purposes (Dabbagh & Kitsantas, 2012).

Table 8
Difference in the Teacher's Level of Competence in ICT in the Area Facilities and Equipment According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	53	57.98	1273.00	0.249		Not Significant
	Older	55	51.15				
Sex	Male	45	53.93	1392.00	0.872		Not Significant
	Female	63	54.90			0.05	
Civil Status	Single	76	55.49	1140.50	0.605		Not Significant
	Married	32	52.14				
Highest Educational Attainment	Lower	51	50.44	1246.50	0.195		Not Significant
	Higher	57	58.13				

Results presented in Table 8 on difference in the level of competence in ICT in the area Facilities and Equipment, revealed no significant differences when grouped and compared according to the variables age, sex, civil status and highest educational attainment as the computed p-value of 0.249, 0.872, 0.605 and 0.195 respectively were greater than the level of significance 0.05. Thus, hypothesis stating that there is no significant difference in the level of competence in ICT in the area Facilities and Equipment is accepted.

The lack of significant differences in the level of competence in ICT in the area of Facilities and Equipment when grouped and compared according to age, sex, civil status, and highest educational attainment suggests that these demographic factors do not significantly influence teachers' proficiency in utilizing ICT tools and resources in this specific area.

The non-significant difference based on age could indicate that regardless of whether teachers are younger or older, they demonstrate similar levels of competence in utilizing facilities and equipment related to ICT. This finding aligns with research suggesting that age may not be a determining factor in teachers' ICT proficiency, as individuals of various age groups can adapt to and learn technology skills effectively (Ertmer et al., 2012).

Similarly, the lack of significant difference based on sex implies that male and female teachers exhibit comparable levels of competence in utilizing ICT facilities and equipment. This finding is consistent with studies that have found no significant gender disparities in teachers' ICT skills and integration practices (Jang & Chen, 2013).

The non-significant difference based on civil status indicates that whether teachers are single or married, they demonstrate similar levels of competence in utilizing ICT facilities and equipment. This suggests that marital status may not play a significant role in shaping teachers' ICT proficiency in this particular area.

The absence of significant difference based on highest educational attainment suggests that whether teachers hold lower or higher educational degrees, they exhibit similar levels of competence in utilizing ICT facilities and equipment. This finding aligns with research indicating that while advanced degrees may contribute to overall pedagogical knowledge, they may not necessarily correlate strongly with ICT skills proficiency (Law et al., 2018).

Overall, these non-significant findings underscore the importance of providing equitable access to ICT training and support for all teachers, regardless of demographic factors such as age, sex, civil status, or highest educational attainment. By offering comprehensive professional development programs and resources tailored to teachers' diverse needs and backgrounds, educational institutions can ensure that all educators are equipped with the necessary skills to effectively integrate ICT into their teaching practices, thereby promoting inclusive and equitable educational experiences for students.t when grouped and compared according to age, sex, civil status and highest educational attainment is not rejected.

Table 9
Difference in the Teacher's Level of Competence in ICT in the Area Productivity Applications According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	53	56.34	1360.00	0.543		Not Significant
	Older	55	52.73				
Sex	Male	45	59.92	1173.50	0.123		Not Significant
	Female	63	50.63			0.05	
Civil Status	Single	76	51.74	1006.00	0.152		Not Significant
	Married	32	61.06				
Highest Educational Attainment	Lower	51	54.39	1448.00	0.973		Not Significant
	Higher	57	54.60				

Results presented in Table 9 on difference in the level of competence in ICT in the area Productivity Applications, revealed no significant differences when grouped and compared according to the variables age, sex, civil status and highest educational attainment as the computed p-value of 0.543, 0.123, 0.152 and 0.973 respectively were greater than the level of significance 0.05. Thus, hypothesis stating that there is no significant difference in the level of competence in ICT in the area Productivity Applications when grouped and compared according to age, sex, civil status and highest educational attainment is accepted.

The lack of significant differences in the level of competence in ICT in the area of Productivity Applications when grouped and compared according to age, sex, civil status, and highest educational attainment suggests that these demographic factors do not significantly influence teachers' proficiency in utilizing ICT tools and applications related to productivity.

The non-significant difference based on age indicates that regardless of whether teachers are younger or older, they exhibit similar levels of competence in utilizing productivity applications. This suggests that age may not be a determining factor in teachers' proficiency with ICT tools related to productivity, which aligns with studies indicating that age does not necessarily correlate strongly with ICT skills proficiency (Al-Gahtani, 2016).

Similarly, the lack of significant difference based on sex implies that male and female teachers demonstrate comparable levels of competence in utilizing productivity applications. This finding is consistent with research suggesting that gender may not have a significant impact on teachers' ICT skills and integration practices (Lei, 2019).

The non-significant difference based on civil status suggests that whether teachers are single or married, they exhibit similar levels of competence in utilizing productivity applications. This implies that marital status may not play a significant role in shaping teachers' ICT proficiency in this particular area.

The absence of significant difference based on highest educational attainment indicates that whether teachers hold lower or higher educational degrees, they demonstrate similar levels of competence in utilizing productivity applications. This finding aligns with research indicating that advanced degrees may not necessarily correlate strongly with ICT skills proficiency (Teo et al., 2018).

Overall, these non-significant findings emphasize the importance of providing equitable access to ICT training and support for all teachers, regardless of demographic factors such as age, sex, civil status, or highest educational attainment. By offering comprehensive professional development programs and resources tailored to teachers' diverse needs and backgrounds, educational institutions can ensure that all educators are equipped with the necessary skills to effectively integrate ICT into their teaching practices, thereby promoting inclusive and equitable educational experiences for students.

Table 10
Difference in the Teacher's Level of Competence in ICT in the Area Online Platforms According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	*Sig. level*	Interpretation
Age	Younger	53	59.94	1169.00	0.073		Not Significant
	Older	55	49.25				
Sex	Male	45	55.61	1367.50	0.752		Not Significant
	Female	63	53.71			0.05	
Civil Status	Single	76	50.76	931.50	0.053		Not Significant
	Married	32	63.39				
Highest Educational Attainment	Lower	51	52.09	1330.50	0.444		Not Significant
	Higher	57	56.66				

Results presented in Table 10 on difference in the level of competence in ICT in the area Online Platforms, revealed no significant differences when grouped and compared according to the variables age, sex, civil status and highest educational attainment as the computed p-value of 0.073, 0.752, 0.053 and 0.444 respectively were greater than the level of significance 0.05. Thus, hypothesis stating that there is no significant difference in the level of competence in ICT in the area Online Platforms when grouped and compared according to age, sex, civil status and highest educational attainment is accepted.、

The lack of significant differences in the level of competence in ICT in the area of Online Platforms when grouped and compared according to age, sex, civil status, and highest educational attainment suggests that these

demographic factors do not significantly influence teachers' proficiency in utilizing online platforms for teaching and learning purposes.

The non-significant difference based on age indicates that regardless of whether teachers are younger or older, they exhibit similar levels of competence in utilizing online platforms. This implies that age may not be a determining factor in teachers' proficiency with online teaching and learning tools, which aligns with studies suggesting that age is not strongly correlated with ICT skills proficiency (Kim & Lee, 2012).

Similarly, the lack of significant difference based on sex suggests that male and female teachers demonstrate comparable levels of competence in utilizing online platforms. This finding is consistent with research indicating that gender may not have a significant impact on teachers' ICT skills and integration practices (Chai et al., 2012).

The non-significant difference based on civil status implies that whether teachers are single or married, they exhibit similar levels of competence in utilizing online platforms. This suggests that marital status may not play a significant role in shaping teachers' ICT proficiency in this particular area.

The absence of significant difference based on highest educational attainment indicates that whether teachers hold lower or higher educational degrees, they demonstrate similar levels of competence in utilizing online platforms. This finding aligns with research suggesting that advanced degrees may not necessarily correlate strongly with ICT skills proficiency (Teo et al., 2012).

Overall, these non-significant findings underscore the importance of providing equitable access to ICT training and support for all teachers, regardless of demographic factors such as age, sex, civil status, or highest educational attainment. By offering comprehensive professional development programs and resources tailored to teachers' diverse needs and backgrounds, educational institutions can ensure that all educators are equipped with the necessary skills to effectively integrate online platforms into their teaching practices, thereby promoting inclusive and equitable educational experiences for students.

Table 11
Difference in the Teacher's Extent of Utilization in ICT in the Area Facilities and Equipment According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	53	58.90	1224.50	0.146		Not Significant
	Older	55	50.26				
Sex	Male	45	56.50	1327.50	0.569		Not Significant
	Female	63	53.07			0.05	
Civil Status	Single	76	52.49	1063.50	0.297		Not Significant
	Married	32	59.27				
Highest Educational Attainment	Lower	51	51.76	1314.00	0.383		Not Significant
	Higher	57	56.95				

Results presented in Table 11 on difference in the extent of compliance in ICT in the area Facilities and Equipment, revealed no significant differences when grouped and compared according to the variables age, sex, civil status and highest educational attainment as the computed p-value of 0.146, 0.569, 0.297 and 0.383 respectively were greater than the level of significance 0.05. Thus, hypothesis stating that there is no significant difference in the extent of compliance in ICT in the area Facilities and Equipment when grouped and compared according to age, sex, civil status and highest educational attainment is accepted.

The non-significant difference based on age could indicate that regardless of whether teachers are younger or older, they demonstrate similar in the extent of utilization in facilities and equipment related to ICT.

Similarly, the lack of significant difference based on sex implies that male and female teachers exhibit comparable in the extent of utilization in ICT facilities and equipment.

The non-significant difference based on civil status indicates that whether teachers are single or married, they demonstrate similar in the extent of utilization in ICT facilities and equipment. This suggests that marital status may not play a significant role in shaping teachers' ICT proficiency in this particular area.

The absence of significant difference based on highest educational attainment suggests that whether teachers hold lower or higher educational degrees, they exhibit similar in the extent of utilization in ICT facilities and equipment. This finding aligns with research indicating that while advanced degrees may contribute to overall pedagogical knowledge, they may not necessarily correlate strongly with ICT skills proficiency (Law et al., 2018).

Table 12
Difference in the Teacher's Extent of Utilization in ICT in the Area Productivity Applications According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	53	52.62	1358.00	0.535		Not Significant
	Older	55	56.31				
Sex	Male	45	52.80	1341.00	0.629		Not Significant
	Female	63	55.71			0.05	
Civil Status	Single	76	51.39	979.50	0.106		Not Significant
	Married	32	61.89				
Highest Educational Attainment	Lower	51	58.55	1247.00	0.197		Not Significant
	Higher	57	50.88				

Results presented in Table 12 on difference in the extent of compliance in ICT in the area Productivity Applications, revealed no significant differences when grouped and compared according to the variables age, sex, civil status and highest educational attainment as the computed p-value of 0.535, 0.629, 0.106 and 0.197 respectively were greater than the level of significance 0.05. Thus, hypothesis stating that there is no significant difference in the extent of compliance in ICT in the area Productivity Applications when grouped and compared according to age, sex, civil status and highest educational attainment is accepted.

The lack of significant differences in the extent of utilization of ICT in the area of Facilities and Equipment when grouped and compared according to age, sex, civil status, and highest educational attainment suggests that these demographic factors do not significantly influence teachers' utilization of ICT tools and equipment.

The non-significant difference based on age implies that regardless of whether teachers are younger or older, they utilize ICT facilities and equipment to a similar extent. This suggests that age may not be a determining factor in teachers' utilization of ICT tools related to facilities and equipment, which aligns with studies indicating that age is not strongly correlated with ICT usage in educational settings (Ertmer et al., 2012).

Similarly, the lack of significant difference based on sex suggests that male and female teachers exhibit comparable levels of utilization of ICT facilities and equipment. This finding is consistent with research indicating that gender may not have a significant impact on teachers' ICT usage and integration practices (Teo, 2018).

The non-significant difference based on civil status implies that whether teachers are single or married, they utilize ICT facilities and equipment to a similar extent. This suggests that marital status may not play a significant role in shaping teachers' utilization of ICT in this particular area.

Highest Educational Attainment: The absence of significant difference based on highest educational attainment indicates that whether teachers hold lower or higher educational degrees, they demonstrate similar levels of utilization of ICT facilities and equipment. This finding aligns with research suggesting that advanced degrees may not necessarily correlate strongly with ICT usage in educational contexts (Al-Gahtani, 2016).

Overall, these non-significant findings underscore the importance of providing equitable access to ICT training and support for all teachers, regardless of demographic factors such as age, sex, civil status, or highest educational attainment. By offering comprehensive professional development programs and resources tailored to teachers' diverse needs and backgrounds, educational institutions can ensure that all educators are equipped with

the necessary skills to effectively integrate ICT into their teaching practices, thereby promoting inclusive and equitable educational experiences for students.

Table 13
Difference in the Teacher's Extent of Utilization in ICT in the Area Online Platforms According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	53	52.78	1366.50	0.571		Not Significant
	Older	55	56.15				
Sex	Male	45	60.32	1155.50	0.098		Not Significant
	Female	63	50.34			0.05	
Civil Status	Single	76	54.47	1214.00	0.989		Not Significant
	Married	32	54.56				
Highest Educational Attainment	Lower	51	50.76	1263.00	0.235		Not Significant
	Higher	57	57.84				

Results presented in Table 13 on difference in the extent of compliance in ICT in the area Online Platforms, revealed no significant differences when grouped and compared according to the variables age, sex, civil status and highest educational attainment as the computed p-value of 0.571, 0.098, 0.989 and 0.235 respectively were greater than the level of significance 0.05. Thus, hypothesis stating that there is no significant difference in the extent of compliance in ICT in the area Online Platforms when grouped and compared according to age, sex, civil status and highest educational attainment is accepted.

The lack of significant differences in the extent of utilization of ICT in the area of Online Platforms when grouped and compared according to age, sex, civil status, and highest educational attainment suggests that these demographic factors do not significantly influence teachers' utilization of online platforms for teaching and learning purposes.

The non-significant difference based on age implies that regardless of whether teachers are younger or older, they utilize online platforms to a similar extent. This suggests that age may not be a determining factor in teachers' utilization of online teaching and learning tools, which aligns with studies indicating that age is not strongly correlated with ICT usage in educational settings (Ertmer et al., 2012).

Similarly, the lack of significant difference based on sex suggests that male and female teachers exhibit comparable levels of utilization of online platforms. This finding is consistent with research indicating that gender may not have a significant impact on teachers' ICT usage and integration practices (Teo, 2018).

The non-significant difference based on civil status implies that whether teachers are single or married, they utilize online platforms to a similar extent. This suggests that marital status may not play a significant role in shaping teachers' utilization of online platforms in this particular area.

The absence of significant difference based on highest educational attainment indicates that whether teachers hold lower or higher educational degrees, they demonstrate similar levels of utilization of online platforms. This finding aligns with research suggesting that advanced degrees may not necessarily correlate strongly with ICT usage in educational contexts (Al-Gahtani, 2016).

Overall, these non-significant findings underscore the importance of providing equitable access to ICT training and support for all teachers, regardless of demographic factors such as age, sex, civil status, or highest educational attainment. By offering comprehensive professional development programs and resources tailored to teachers' diverse needs and backgrounds, educational institutions can ensure that all educators are equipped with the necessary skills to effectively integrate online platforms into their teaching practices, thereby promoting inclusive and equitable educational experiences for students.

Conclusions

Teachers demonstrate a high level of competence in utilizing various ICT tools and equipment for teaching purposes, such as multimedia content tools and interactive whiteboards. Teachers report a great extent of utilization of ICT facilities and equipment in teaching, including virtual reality devices and audio-visual equipment. Study results shows high level of engagement with digital platforms for delivering educational content and facilitating student interaction. Also, results shows no significant differences in the level of competence and extent of utilization of ICT among teachers based on demographic variables, suggesting a consistent level of readiness across the teaching workforce. In the light of the findings and conclusions derived from the study, the following recommendations and plan of actions were formulated: 1) Allocate resources for ongoing professional development programs focused on enhancing teachers' ICT competencies; 2) Integrate ICT skills development into teacher education programs and professional development curricula. Ensure that teachers receive training on the latest technologies and instructional strategies; 3) Collaborate with educational institutions to provide access to affordable and user-friendly ICT tools and platforms. Offer support services and training programs to assist teachers in effectively utilizing ICT resources; 4) Create a supportive environment that encourages the integration of ICT into teaching practices. Provide access to technology infrastructure and technical support to facilitate seamless implementation; 5) Invest in the development of digital infrastructure and resources to support the widespread adoption of ICT in education. Advocate for policies that promote equitable access to technology for all schools and teachers; 6) Develop training modules and resources specifically focused on effective utilization of ICT in teaching and learning. Provide ongoing support and guidance to help teachers overcome barriers and challenges associated with ICT integration; 7) Foster a culture of innovation and continuous improvement within the school community. Encourage collaboration and knowledge-sharing among teachers to promote best practices in ICT integration; 8) Prioritize investments in ICT infrastructure, professional development, and support systems to ensure that teachers are equipped with the necessary skills and resources to effectively integrate technology into their teaching practices; and 9) Advocate for policies and initiatives that promote equitable access to technology and support the professional growth of teachers. Collaborate with schools and government agencies to develop comprehensive strategies for ICT integration in education.

Acknowledgment

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