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Teachers' Technological Proficiency and Learners' ICT Skills

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ABSTRACT: The study investigated the relationship between the teachers' technological proficiency and learners' ICT skills, as observed by the teachers. This study sought to ascertain the teachers' level of technological proficiency in terms of literacy, adaptability and manipulation. It also aimed to evaluate the learners' level of ICT skills as observed by their teachers, to find the significant relationship between the teachers' level of technological proficiency and ICT skills and to identify which of the independent variables singly or in combination influence the learners' ICT skill. Correlational and causal research designs were employed. An adapted survey questionnaire which passed the validity and reliability tests was utilized and conducted to 105 teachers selected through random sampling. Mean, Standard Deviation, Pearson Product Correlation Coefficient and Multiple Linear Regression were the statistical techniques used in this study. Results showed that the teachers have very highly proficient technological skill. The learners' ICT skills are highly observed by the teachers. There is a moderate positive correlation between the teachers' technological proficiency and learners' ICT skill. The teachers' technological proficiency influence learners' ICT skill. Thus, learners' ICT skill may be more observed depending on the teachers' technological proficiency. It can be recommended that teachers may continue to enhance and get updated with technological sophistication in order to utilize it in their teaching and learning delivery to their learners.

KEYWORDS: ICT integration, literacy skills, technological proficiency

I. INTRODUCTION

Integrating information and communications technology (ICT) into education has become essential in the quickly changing digital society today. Technology essentially includes the wide range of tools, techniques, and organized methods that people use for creating products, providing services, and achieving a variety of goals. From the basic designs of ancient implements to the complex structures of modern computing and artificial intelligence, technology influences nearly every aspect of today's life. It fundamentally alters how to connect with one another, perform jobs, gain knowledge, travel, and partake in recreational activities.

A related idea is technological proficiency, which refers to an individual's skill in effectively using, understanding, and managing different technological tools and systems. This goes beyond simply knowing how to operate them. It includes basic computer skills, digital and internet literacy, knowledge of security and privacy guidelines, and the essential ability to adapt and learn new technological innovations. Developing technological proficiency is increasingly important, as it boosts efficiency, enhances communication, expands access to information and education, improves job prospects, and enables more effective problem-solving in an increasingly technology-driven society.

Nevertheless, digitalization presents opportunities for significant enhancement in educational institutions, as emphasized in the OECD study (2021), which emphasized that utilizing digital tools and practices can improve the efficacy of instruction and give learners the necessary ICT skills. This suggests that to successfully include digital tools into their classroom and create an atmosphere where learners may hone their ICT skills, teachers must acquire excellent technological capabilities. To fully realize the transformative potential of digitalization in education, reference emphasizes the significance of both teacher preparedness and learner skill development.

Additionally, in an increasingly digital world, the acquisition of influential ICT skills is no longer a supplementary educational goal but a fundamental necessity for learners' academic success, future careers, and effective participation in society. Teachers stand at the forefront of this educational imperative, acting as crucial facilitators in the development of these skills.

Moreover, their capacity to effectively cultivate digital literacy in their learners is significantly intertwined with their own technological proficiency.

Thus, a study examining the direct relationship between teachers' technological competence and their learners' ICT skills holds profound importance. Education systems around the world have boosted their funding for the incorporation of information and communication technology (ICT) Fernández-Gutiérrez (2020). It emphasized ICT's role in enhancing learning, improving outcomes, and modernizing teaching, aligning with the focus on its impact on learner engagement, accessing disparities, or policy analysis. This serves as a key reference to situate this research within global educational trends. It is a critical investigation that can yield evidence-based insights to inform targeted teacher training programs, shape effective educational policies concerning technology integration, and ultimately enhance the digital capabilities of learners, thereby better preparing them for the demands of the 21st century and beyond. Ignoring this connection would be a significant oversight in our efforts to equip the next generation with the essential skills for a technology-driven future.

In this case, information and communication technology, or ICT, plays a crucial role in helping learners access a variety of sources of up-to-date educational resources and real-world inputs. Teachers must be proficient in the proper use of technology in the classroom in order to have the basic skills and knowledge associated with the teaching profession (Koh, 2021). It emphasizes the importance of teachers not just knowing how to use technology, but understanding how to use it effectively to teach specific content. Determining proficiency in incorporating technology into the classroom offers indicators for the effective implementation of professional development procedures for teachers.

Thus, teachers' technological competencies in the teaching-learning process refer to their competencies in various technologies ranging from low technology such as pen and paper to digital technology such as the internet, digital video, interactive whiteboards, and software programs (Ventayen,2019). Teachers need to be able to realize not only the subject they teach but also the goal-behaviors of their teaching by using technology effectively. The integration and acceptance of technology in teaching by teachers is thought to be affected by several factors, such as their confidence in their professional abilities, age, educational background, and their views on the technology. The primary goal of the study was to assess the connection between the technological abilities of teachers and the ICT skills of their learners. Gaining this insight is vital for shaping initiatives that will enhance both teacher education and curriculum design, with the ultimate objective of boosting learners' ICT skills for the digital era and for the technological demand of the 21st century.

Observing learners was an essential part of assessing their ICT skills. When teachers watch learners engage with technology, they gain valuable insights into their technical abilities, information literacy, communication skills, creativity, and problem-solving capabilities. These firsthand observations help teachers recognize strengths, identify areas for improvement, and customize their teaching approaches. This ongoing assessment through observation allows teachers to offer prompt feedback and modify their instructional methods to better address the individual and group needs of their students as they develop vital ICT skills for the digital age. Although this is a technical document for a comprehensive evaluation, it highlights the significance of comprehending different aspects of ICT literacy, which teachers can learn about through observation (Fraillon, 2020).

This theory is based on the Technological Pedagogical Content Knowledge (TPACK) Model developed by Mishra in 2021. It explains the interconnections and intricacies among the three fundamental elements of knowledge: technology, pedagogy, and content. Draws attention to how three important knowledge domains—technological (TK), pedagogical (PK), and content knowledge (CK)—are integrated. It emphasizes that integrating these domains to produce captivating and successful learning experiences is necessary for effective teaching with technology. With TPACK at its core—the all-encompassing knowledge required for teaching in the twenty-first century—the model identifies overlaps such as technical content knowledge (TCK), pedagogical content knowledge (PCK), and technical pedagogical knowledge (TPK). This framework assists teachers in evaluating and enhancing their ability to incorporate technology into their teaching. Teachers' Technological Proficiency pertains to the ability of teachers to enhance the teaching and learning experience through the effective application of digital tools, platforms, and technology. This skills set encompasses a diverse array of capabilities, including the use of educational software, integrating technology into lesson plans, managing virtual classrooms, and encouraging learner engagement and online communication. Teachers who are skilled in technology can create inclusive, interactive, and engaging learning environments that address the needs of various students and foster 21st-century skills (Sankaran, 2020).

Alongside technical skills, this capability includes the assessment and selection of appropriate digital tools, troubleshooting technological issues, and promoting the ethical and responsible use of technology. Teachers' technological proficiency directly influences learners' learning experiences and results, as it enables them to model responsible technology use and instills confidence in learners to navigate digital environments. Continuous professional development and institutional

support are essential for improving teachers' technological abilities and ensuring they can adapt to evolving educational technologies and innovations.

The ICT skills of learners refer to their capability to utilize information and communication technology (ICT) tools for collecting, evaluating, and distributing information in educational settings as well as in everyday life. This encompasses more advanced abilities such as programming, conducting internet research, and evaluating digital content for relevance and credibility, as well as more fundamental ones like using word processors, spreadsheets, and presentation software. ICT proficiency enables learners to work with peers, access a wealth of online resources, and participate in virtual learning environments, making them more autonomous, resourceful, and flexible in their academic endeavors. It related to the study of Fraillon (2020), it explored differences within and across countries with respect to the relationship between ICT-related learning outcomes, learners' characteristics, and school contexts. This study emphasizes that learners' ability to develop and apply essential skills is heavily impacted not only by their personal backgrounds and characteristics but also by the particular educational environments they engage with.

Additionally, comparisons between countries suggest that broader systemic elements, including national education policies and cultural values, likely play a role in the varied levels of ICT proficiency seen around the world. As a result, efforts to improve learners' ICT skills need to recognize and tackle these different influencing factors, shifting from generalized strategies to more context-specific and tailored approaches at both the national and local levels. Grasping these nuances is vital for creating effective programs that can genuinely promote digital literacy and competence among learners globally.

II. METHODOLOGY

The study utilized the correlational and causal research designs, where the correlational research design means two or more relevant variables and assesses the relationship between them, while causal research design examines the cause-and-effect relationships between variables and documentary analysis evaluating documents both printed and electronic in a methodical manner. A correlation might have either positive or negative direction (Scribbler, 2021). According to Dovetail (2023) causal research examines a research question's variables and how they interact. It is easier to pinpoint cause and effect since the experiment often happens in a controlled. Researchers can conduct causal research at any stage, but they typically use it once they know more about the topic.

The following statistical treatments were used to analyze the data of the study. In Problem 1 and 2 Mean values and Standard Deviation, value were used to present the extent of the influence of the teachers' technological proficiency. In Problem 3 Pearson Product Correlation Coefficient (r) was utilized to ascertain substantial correlation between the teachers' technological proficiency and learners' ICT skills. In problem 4 Multiple Linear Regression analysis was employed to ascertain which of the independent variables, singly or in combination influence the dependent variables.

III. RESULTS AND DISCUSSION

Problem 1. What is the level of the teachers' technological proficiency in terms of:

1.1 literacy skills;
1.2 adaptability; and
1.3 manipulation?

Table 1. Teachers' Overall Technological Proficiency

Variables	Mean	SD	Description	Interpretation
Literacy Skills	4.59	0.53	Always	Very Highly Proficient
Adaptability	4.54	0.53	Always	Very Highly Proficient
Manipulation	4.48	0.53	Always	Very Highly Proficient
Overall	**4.54**	**0.53**	**Always**	**Very Highly Proficient**

Note: 4.21-5.00 Very Highly Proficient; 3.41-4.20 Highly Proficient; 2.61-3.40 Moderately Proficient; 1.81-2.60 Low Proficient; 1.00-1.80 Very Least Proficient

Table 1 shows the overall level of teachers' technological proficiency. It reveals that it has an overall Mean of 4.54 with SD = 0.53, described as Always and Very Highly Proficient. This implies that teachers possess a high level of digital literacy enabling them to successfully integrate technology into their teaching methods and enhance leaner learning experiences and increase

productivity. Strong digital literacy can help create a more dynamic and engaging classroom environment, which in turn can increase learner motivation and engagement.

Teachers with high digital literacy are likely to be able to experiment with a greater variety of pedagogical approaches that take advantage of technology's capabilities, confidently choose and modify digital tools and resources to meet specific learning objectives and the diverse needs of their learners. In his study Catog (2023), the overall level of technology proficiency of the school teachers was very high. Research revealed that public elementary school teachers demonstrated exceptional technological proficiency. This skill set notably impact their teaching approaches, especially in the incorporation of technology into their instructional methods. His investigation enhances the general understanding of how technological abilities and aspects of the school environment affect teaching practices in educational institutions.

Moreover, the level of teachers' technological proficiency, Literacy Skills, got the highest Mean of 4.59 with SD = 0.53, described as Always and interpreted as Very Highly Proficient. This suggests that teachers have a solid understanding of digital literacy, which allows them to utilize technology effectively to enhance learners' learning. Teachers with this essential digital literacy are likely better prepared to leverage various digital resources, including productivity tools and online learning platforms, to enhance their teaching and engage students. Chanda et al. (2024) noted that digital literacy has become an essential skill for equipping learners for future employment. As various sectors grow more digitized, the capability to maneuver, assess, and make use of digital tools and platforms is now a requirement rather than merely a benefit.

Thus, the level of teachers' technological proficiency, Manipulation Skills, have the lowest Mean of 4.48 with SD = 0.53, described as Always and interpreted as Very Highly Proficient. This implied that teachers' manipulative skills potentially impacting their skills to effectively integrate technology into teaching methods. This might indicate a preference for simpler features instead of more elaborate software or hardware, which could restrict the breadth and originality of technology integration in their classes. By addressing this issue with focused training and professional development, teachers may gain the confidence and skills necessary to use technology to improve student learning. Based on Sand (2020) stated that in order to produce the desired results, teachers must be able to apply the technology knowledge and abilities necessary for professional work duties and responsibilities. For a several reasons, it is essential for 21st century education to incorporate technology into the curriculum.

Problem 2. What is the level of the learners' ICT Skills as observed by their teachers?

Table 2 demonstrates the level of learners' ICT Skills as observed by their teachers. It shows that it has an overall Mean of 4.52 with SD = 0.55, described as Strongly Agree and interpreted as Always Observed. This implies that teachers observed that learners were highly proficient in ICT, indicating that learners are confident and competent in using technology. Additionally, this makes them more receptive to technology-integrated learning and empowers them to explore information autonomously. Furthermore, their influential ICT skills provide an advantage for future endeavors, and enable teachers to utilize more advanced technology in the classroom. Therefore, these learners are also likely capable of creating and sharing digital content effectively. Based on Lei et al. (2021) learners with greater ICT literacy often had substantively higher academic achievement which is moderated by demographics, knowledge assessments, and study design.

Table 2. Learners' ICT Skills

My learners…	Mean	SD	Description	Interpretation
1. Can navigate websites safely with guidance.	4.52	0.58	Strongly Agree	Always Observed
2. Enjoy using technology for learning activities.	4.65	0.51	Strongly Agree	Always Observed
3. Pay attention when I use technology in lessons.	4.61	0.50	Strongly Agree	Always Observed
4. Practice using technology after I demonstrate it.	4.55	0.55	Strongly Agree	Always Observed
5. Can watch and learn from educational videos online.	4.59	0.54	Strongly Agree	Always Observed
6. Can open and use basic programs like Word or Paint.	4.47	0.60	Strongly Agree	Always Observed
7. Learn faster when I explain lessons using technology.	4.46	0.57	Strongly Agree	Always Observed
8. Find learning more interesting when I use technology.	4.50	0.60	Strongly Agree	Always Observed
9. Can use a search engine like Google to find information.	4.50	0.59	Strongly Agree	Always Observed
10. Participate actively in class when digital tools are used.	4.40	0.52	Strongly Agree	Always Observed
11. Follow my instructions when using digital tools in class.	4.42	0.51	Strongly Agree	Always Observed
12. Share what they learn about technology with classmates.	4.42	0.56	Strongly Agree	Always Observed
13. Know how to turn on and shut down a computer or tablet.	4.58	0.51	Strongly Agree	Always Observed
14. Ask for help when they do not understand how to use ICT	4.53	0.52	Strongly Agree	Always Observed

tools.				
15. Can type simple words and sentences using a computer or tablet.	4.51	0.53	Strongly Agree	Always Observed
Overall	**4.52**	**0.55**	**Strongly Agree**	**Always Observed**

Note: 4.21-5.00 Always Observed; 3.41-4.20 Most of the time Observed; 2.61-3.40 Sometimes Observed 1.81-2.60 Seldom Observed; 1.00-1.80 Never Observed

Moreover, the indicator 2, My learners enjoy using technology for learning activities, got the highest Mean of 4.65 with SD = 0.51, respectively described as Strongly Agree and interpreted as Always Observed. This implied that learners are more likely to be engaged and motivated in learning activities when technology is used, potentially leading to improved academic outcomes. Additionally, the integration of technology in education can lead to greater learner engagement and motivation, potentially improving academic outcomes. This can be pursued through personalized learning pathways, the development of digital literacy, and increased access to resources. However, the PISA context, ICT engagement enables learners to control their learning through ICT tools on their initiative. This, in turn, leads to an increased in learners' intrinsic motivation to use ICT and the development of their ICT knowledge and skills (Weng, 2020).

Thus, technology enhances collaboration, communication, and opportunities for creative expression, enriching the overall learning experience. Pandita (2023) emphasized that technologies such as online discussion forms, virtual simulations and interactive multimedia resources help to create a more engaging and interactive learning environment that encourages learners to take an active role in their own learning. This, in turn, increases the likelihood that learners are more likely to feel motivated and engaged with the course content.

In addition, the indicator 10, My learners participate actively in class when digital tools are used, the lowest Mean of 4.40 with SD = 0.52, described as Strongly Agree and interpreted as Always Observed. This implied that learners may not be following instructions, potentially leading to a crisis in classroom management and distractions. Therefore, learners may not finish tasks or grasp the subject matter, which would hinder their academic progress. Additionally, this can also breed disrespect for the teacher and classroom rules, potentially leading to more significant behavioral problems. In the end, teachers spend more time on discipline, reducing the time available for teaching. According to recent studies, many teachers are still comfortably staring at the prospect of successfully incorporating technology into their lesson plans.

According to a paper by Sadaf (2021), the majority of teachers lack the necessary abilities and self-efficacy to integrate technology as an instructional tool, which therefore impacts their ability to teach. This emphasizes the necessity of all-encompassing professional development programs that can improve teachers' technological proficiency and increase their self-assurance in their ability to use technology in the classroom. Gurung, (2024) elaborated that most of the learners now use their phones to learn. Unfortunately, this also pushes a range of potential distractions at their fingertips. Smart phones can facilitate learning but can also keep learners from paying attention to practicing key behaviors such as note taking. Furthermore, there is attention contagion, where learners do worse if the person next to them is distracted versus paying attention.

Problem 3. Is there's a significant relationship between the teachers' level of technological proficiency and learners' ICT skills?

Table 3. Test of Correlation Between Teachers' Technology and Learners' ICT Skills

Independent Variables	r-value	p-value	Description	Decision on Ho	Interpretation
Literacy Skills	0.689**	0.000	Moderate Positive	Reject	Significant
Adaptability	0.688**	0.000	Moderate Positive	Reject	Significant
Manipulation	0.666**	0.000	Moderate Positive	Reject	Significant

Note: MPC = Moderate Positive Correlation Significant when computed p-value <0.05

The table 3 shows Pearson's correlation test between the teachers' level of: technological proficiency and ICT skills. The test reveals a moderate positive correlation between the variables, wherein, if the teachers' technological proficiency in terms of literacy, adaptability, and manipulation changes its direction the learners' ICT Skills as observed by their teachers also change in the same direction. The table took the analysis at the independent variable level by looking at the correlation test while holding the dependent variables constant at a time. As can be seen from the same table, teachers' technological proficiency and learners' ICT Skills as observed by their teachers had a significant relationship at 0.05.

In summary, taking it at the coefficient level, the teachers' technological proficiency in terms of literacy, adaptability, and manipulation are correlated to their learners' ICT Skills as observed by their teachers, with a p value less than 0.05. Thus, the correlation analysis yielded that the null hypothesis test (Ho1) was rejected. With the following findings, moderate positive correlation. This suggests that this association is also indirectly supported by the widespread emphasis on the need for teachers to be tech-savvy in order to meet learning objectives and the significance of integrating technology into the curriculum to improve the teaching and learning processes. Teachers that are tech-savvy are better able to help their learners develop ICT abilities. However, Mohamad (2020) states that ICT is used to improve Generation Z learners' understanding to promote the essence of 21st-century learning, implying a link between teachers' use of technology and learners' ICT skills.

Problem 4. Which of the independent variables singly or in combination influence the Leaners' ICT skill?

The table 4 presents regression analysis with moderating variables that predict the learners' ICT skills. It is hypothesized that the predictor will be positively associated with learners' ICT skill as observed by their teachers where $\beta = 0$ as null and the alternative of $\beta \neq 0$. That explains whether the independent variables are good predictor of learners' ICT skills. Results show that the 53.7% of the variance is explained by the predictor, F (3,105) = 42.154.

Table 4. Multiple Linear Regression

Variables	UC		SC		
	B	**SE**	**β**	**t-value**	**Sig. (p-value)**
Constant (Learners' ICT Skills)	0.437	0.391	1.211	1.118	0.266
Literacy	0.114	0.097	0.406	3.177	0.000
Adaptability	0.411	0.106	0.623	3.864	0.000
Manipulation	0.378	0.101	0.579	3.722	0.000
	R	**R^2**	**Adjusted R^2**	**f-value**	**Sig. (p-value)**
	0.742	0.550	0.537	42.154	0.000

Moreover, the analysis of the data demonstrates a notable and positive correlation between literacy and the dependent variable, reflected in a standardized beta coefficient (beta) of 0.406. This positive coefficient suggests that an increase in literacy levels is associated with an increase in the dependent variable as well. The strength of this association is further confirmed by a t-value of 3.177, which is quite substantial, along with a p-value of 0.000 (typically indicating $p < 0.001$). This exceptionally low p-value indicates that the identified relationship is extremely statistically significant, implying a minimal chance of observing such a moderate outcome by random chance if no actual relationship existed in the broader population. Hence, these results moderately indicate that literacy serves as a moderate and positive predictor of the dependent variable in this study's context.

Thus, the statistical evaluation demonstrates a moderately significant and moderate positive correlation between adaptability and the dependent variable. With a standardized beta coefficient (beta) of 0.623, the findings suggest that as adaptability rises, the dependent variable also tends to increase substantially. This solid relationship is further emphasized by a t-value of 3.864 and a p-value of 0.000, which is significantly lower than typical significance thresholds. Such a low p-value provides moderate evidence that this observed positive connection is not attributable to random fluctuation, but instead reflects a genuine and meaningful association. As a result, these results underscore adaptability as an important and influential predictor of the dependent variable in this study's context.

On the other hand, the statistical analysis of manipulation reveals a moderately significant and moderately positive relationship with learners' ICT skills. With a standardized beta coefficient (beta) of 0.579, the findings indicate that as opportunities for manipulation increase, so too do learners' ICT skills. This substantial positive association is further underscored by a robust t-value of 3.722 and an exceptionally low p-value of 0.000, confirming that this observed connection is moderately unlikely to be due to mere chance. In the context of ICT, manipulation refers to the active, hands-on interaction and control learners exercise over digital tools, data, and information whether it is organizing spreadsheets, editing multimedia, or programming. This result moderately advocates for educational approaches that prioritize active engagement and direct interaction with technology, as these methods appear to be crucial drivers in enhancing learners' digital proficiency.

It can be concluded that if the teachers' technological proficiency in terms of literacy, adaptability, and manipulation increases by 1% their learners' ICT skills as observed by their teachers will also increase by 40.6%, 62.3% and 57.9%. Based on Akram's (2022) as well as Pagupat and Oco (2025) finding that teachers view technology integration favorably and believe it

improves learning implied that when teachers are more proficient in using technology, it positively impacts the learning experience and, consequently, the development of learners' skills. Moreover, Armstrong (2019) by linking manipulation to the skillful handling needed by teachers to enhance learning, it suggests that teachers' proficiency in this area can positively influence learners' digital literacy.

Thus, teachers should receive certified training to improve their technological literacy and their ability to incorporate technology into their lessons Bowman (2022). This emphasized how crucial it is to give teachers' appropriate training in order to improve their technological literacy. For teachers to successfully incorporate technology into their lessons and enhance learners' learning outcomes, this training is essential.

IV. CONCLUSIONS

Based on the findings, the following conclusions are found:

1. Teachers are skilled in the use of technology.
2. The learners have high level ICT skills.
3. The more teachers have technological proficiency the more learners have ICT skills.
4. Teachers' technological proficiency impacts learners' ICT skills.

V. RECOMMENDATIONS

Based on the findings and conclusions, this study came out with the recommendations to enhance the teachers' technological proficiency and learners' ICT skills:

1. For teachers to sustain their high technological proficiency in teaching, they may stay informed about the latest trends in teaching.
2. Learners need to continue learning new skills in ICT in order to cope with the trends today.
3. Learning is a continuous process. Updating, upskilling, training and activities to enhance teachers' technological skills may be given priority for learners to also continue enhancing their ICT skills.
4. Teachers may continue to enhance their technological proficiency in teaching so as to continually influence the learners.

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