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Teachers' Knowledge on Digital Technology and Their Proficiency

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ABSTRACT

The rapid progression of digital technology profoundly influences the educational sector, offering improvements in teaching efficacy and student engagement. This study aimed to determine the level of Teachers' Knowledge on Digital Technology and their Proficiency in the Division of Iligan City, School Year 2023-2024. Mainly, it delved into the respondents profile; the level of knowledge on digital technology; the level of technological proficiency; the significant relationship between teacher's knowledge on digital technology and their proficiency; and significant difference in the teachers' knowledge on digital technology and their proficiency when grouped according to their profile. This research employed a descriptive correlation method, focusing on teachers from Kindergarten to Grade 6 across selected public elementary schools in Iligan City. The instruments were patterned and modified, 300 teachers in the study were surveyed during School Year 2023-2024 using a universal sampling procedure. The analysis was conducted using statistical tools such as mean, standard deviation, and Pearson's R correlation and ANOVA for the inferential statistics. Findings revealed that the level of teachers' knowledge on digital technology is very high as well as their proficiency. It was found the effective integration of pedagogical strategies with technology use is critical for enhancing educational outcomes. Hence, there is a significant relationship between the teachers' knowledge on digital technology and their proficiency. It is recommended to design comprehensive training modules on technology integration, implement mentorship and support systems for teachers.

Keywords: *Knowledge on digital technology, proficiency*

INTRODUCTION

Background of the Study

This study proposes a positive and interdependent relationship between teachers' knowledge of digital technology and their proficiency. The research aims to provide a comprehensive understanding of the current state of digital literacy among teachers, identifying strengths and weaknesses, and ultimately contributing to a more effective and equitable use of technology in education. The issues that teachers highlighted for an effective integrative approach towards digital technology for students' performance were also linked with the fundamental requirements and conditions that would assist them to effectively utilize digital technology in classrooms. In fact, the educational curriculum reflects a comprehensive long-term strategy for technology integration. The most important factor was having a sustainable schedule for workshops that focus on teacher training and involve all other personnel in the learning environment. Consequently, the availability and functionality of updated software, devices, and equipment in the respective classrooms was crucial.

Leshchenko et al. (2020) postulate that paving forward to digitalization of society and school does not merely support learning but it transforms the learning process and how teaching and learning are interpreted in its context. Accordingly, the integration of digital technology in education has brought an immense advantage not only for students but more so with teachers. Teachers are able to work efficiently as it provides new solutions for preparing lessons and assessments with the students without neglecting any administrative task and thereby allowing teachers to save time for their learning.

Adarkwah (2021) cited that digital technology integration helps both teachers and students. A technological-based learning allows learning to be more enjoyable and engaging as students have become more involved in their work as they are not bounded by limited curriculum and resources as it is designed to help them stimulate understanding through hands-on activities which paving forward to active learning strategy. On the other hand, technology-based teaching offers a high-pitch teaching strategy as it helps them to design lesson plans in a creative, effective and interesting approach paving forward to a more learner-content instructions.

This was supported by OECD (2019) which enunciated that digitally-intensive environments are likely to maintain workers' skills and enable them to learn more from co-workers such is the case for teachers, as teachers increasingly use technology in school, they perform tasks differently and will impact their skills development. Further, this study is deemed to provide a detailed overview of the level of teacher's knowledge of the content and digital pedagogical practices and more so, to measure the teacher's technological proficiency. This study has provided a realistic view of the current state of digital technology integration in education. It has also offered valuable insights and perspectives that may have piqued the interest of educators and administrators. Ultimately, the goal was to encourage them to fully invest in this emerging transition of learning and technology.

Literature and Related Studies

Respondent's Profile

Teachers occupy various positions within the educational system, ranging from classroom educators to administrative and leadership roles. The literature highlights that teachers' positions significantly influence their instructional methods, relationships with students, and professional development opportunities. Classroom Teachers are the frontline educators responsible for delivering the curriculum and directly engaging with students. Research has shown that their position has a substantial impact on student outcomes, particularly when teachers have autonomy in the classroom and are supported with adequate resources (Dutta and Nessa, 2022).

Lead teachers and mentor teachers often take on additional responsibilities, such as supporting less experienced colleagues, leading professional development, and helping implement school-wide instructional strategies. Studies indicate that these positions foster a culture of collaboration and increase overall teaching quality. School Administrators (such as department heads, principals, or instructional coordinators) generally have moved beyond classroom teaching to roles focused on curriculum design, school policy, and teacher evaluations. Literature suggests that having experienced teachers in administrative positions can lead to more effective decision-making and teacher support, promoting better student outcomes by (Dutta and Nessa, 2022).

Educational attainment refers to the highest level of education teachers have completed, which often influences their instructional skills, content knowledge, and pedagogical methods. For the bachelor's degree; a minimum requirement for teaching positions is a bachelor's degree in education or a related field. Research shows that teachers with a bachelor's degree, while capable of teaching effectively, may have limitations in specialized subjects compared to those with advanced degrees. For master's degree; many studies suggest that teachers with a master's degree tend to have a deeper understanding of their subject matter, better instructional strategies, and a stronger ability to adapt lessons to diverse student needs.Further, the master's degree are often linked to increase teacher efficacy, especially in content-heavy subjects like Math and Science. However, the doctoral degree have a small percentage of teachers. These educators are typically involved in higher education or administrative roles. Research shows that doctoral-level educators are often engaged in curriculum development, educational research, and policy-making. They bring a higher level of expertise, particularly in specialized subjects, but may have less direct classroom experience by (Vuorikari, 2018).

Teaching experience is a significant factor influencing teacher effectiveness, student outcomes, and professional growth. The literature identifies distinct phases of teaching experience: Dharma et al. (2022) elaborated that novice teachers (0-3 years) often struggle with classroom management, differentiated instruction, and lesson planning. However, with mentoring and support, they rapidly improve, particularly in student engagement and content delivery. The Mid-Career teachers (4-10 years) indicate that teachers in this phase are generally more effective, having refined their instructional skills. They often feel more confident in classroom management and are more likely to experiment with innovative teaching strategies. Mid-career teachers are considered highly valuable due to their combination of experience and openness to professional development. While veteran teachers (10+ years) are the experience teachers have usually mastered classroom management and have a wealth of pedagogical knowledge. Research shows that while they bring stability and expertise to the classroom, they may require ongoing professional development to stay current with new teaching methodologies and technology.

Teachers' Knowledge on Digital Technology

The concept of teachers' knowledge on digital technology is a dynamic field which has been on the mind of many scholars one notable notion on the pedagogical content of knowledge fueled by a revolutionized understanding of teachers' knowledge and its development. This study adopted the concept of Technological Pedagogical Knowledge and Technological Pedagogical Content Knowledge elaborated by Fahadi and Khan (2021). Components of TPACK undertaken in this study are technological knowledge, pedagogical knowledge, content knowledge, pedagogical content knowledge, technological content knowledge, technological pedagogical knowledge and technological pedagogical content knowledge.

Technological Knowledge

Fahadi and Khan (2021) elaborated that technological knowledge under technological pedagogical knowledge and technological pedagogical content knowledge components revolves around the level of the teachers' understanding on the existence of technology as part learning process. It is the expression of the specific application of knowledge and technique to a particular technological activity. Hence, it encompasses standard tools in the classroom setting such as chalk, books, and board, and most importantly advanced tools such as digital video and internet platforms. This was supported by Zeng (2020) who postulated that technological knowledge includes more than a compendium of information facilitated or transferred to the students, it includes concepts, theories, facts, and general information for students and such it can be deduced that technological technology proffered a variety of meaning that would help individuals to used such knowledge into practical applications.

Pedagogical Knowledge

Zeng (2020) enunciated that pedagogical knowledge is the knowledge a teacher has on the general pedagogical activities regardless of the subject matter and areas of mastery. Accordingly, this knowledge is considered a teaching strategy as it aims to motivate students and learners toward cooperative learning and problem-based learning in all areas. In the integration of digital technology, pedagogical knowledge further requires a deeper understanding on teaching and learning process with the use of technology. It encompasses utilization of technological tools in content presentations and employment of educational strategies in building-up students' knowledge and skills as cognitive, social and developmental learning processes are simultaneously applied.

This was in conformity with Haron et al. (2021) perspective that level of teacher's pedagogical knowledge is far important in providing quality teaching as it attracts student's attention in terms with diverse classroom activities through utilization of various available such as technology to enhance learning ability and process. Moreover, in today's technological world, the use of technology facilitates interactive learning inside or outside the classroom. Hence, teachers' pedagogical knowledge is an important determinant of quality teaching.

Content Knowledge

Arguably, understanding the content matters for teaching profession, nonetheless, what constitutes understanding of the content has been loosely defined and such has provoked the interest of many scholars as to its definite meaning. Fahadi and Khan (2021) enunciated that content knowledge implies the amount of information or knowledge per see in the mind of the teacher. It is the specific professional knowledge on the subject matter which the teachers teach in the classroom settings. Lastly, it entails understanding the concept of what makes learning easy or difficult on specific topics or lessons. This was further elaborated by Malik et al. (2018) opined a basic definition of content knowledge which is knowledge about the subject matter to be learned. Accordingly, the integration of digital technology will likely profound the knowledge in the form of ideas, frameworks, and concepts through digital tools such video clips, sound editing and animations, thus, learning content on the subject matter has become effective.

Pedagogical Content Knowledge

Pedagogical content knowledge refers to the understanding of content knowledge and how teachers teach their students that content consists of two parts such as content and pedagogy. Content knowledge encompasses understanding of frameworks, theories, concepts and ideas. On the other hand, pedagogical knowledge is related to instructional strategies and procedures, such as planning, assignments, classroom management and student learning. Alkalaki (2021) cited that pedagogical content knowledge involves the teacher's subject matter which is the content knowledge and their employed instructional methods to convey such learning or the pedagogical knowledge aspect. In simpler terms, it is the combination of the teacher's instructional methods on the subject matter. Hence, it can be deduced that this component is unique to teachers as it is focused on what they know about teaching and what they know about on what they teach.

Technological Content Knowledge

Malik et al. (2018) elaborated the importance of technology content knowledge as it entails a deeper understanding on the role of technology on the subject matter. Accordingly, it selects technologies that best embody, support or illustrate particular content-based precepts. This was supported by Fernandez (2019) who postulated that content knowledge and technology have a long history together. Innovations in technology have also provided new metaphors for comprehending reality. Some of the ways that technologies have given rise to new ways of looking at phenomena include seeing the brain as an information processing machine or the heart as a pump. These metaphorical and symbolic allusions are profound. They frequently result in the disciplines' core natures changing. To create effective technological tools for teaching, it is essential to comprehend how technology affects the methods and expertise of a particular profession. The kinds of content concepts that can be taught are both made possible and limited by the tools used. Similarly, the kinds of technology that can be employed can be restricted by specific content selections.

This was further supported by Fahadi and Khan (2021) who established a notion that technological tools offer an increased level of flexibility towards the subject matter. Hence, understanding which technology affects the content

is very important. Teachers therefor need to be an expert not only in the subjects they teach but also in the ways that specific technology can alter the subject matter or the representations that can be created. Teachers must comprehend which particular technologies are most appropriate for addressing subject-matter learning in their domains and how the technology influences or even changes the content, or the other way around.

Technological Pedagogical Knowledge

According to Malik et al. (2018) technology pedagogy knowledge is a body of knowledge on how to use technology to facilitate active learning and help make the subject matter's concepts easier to understand can lead to changes in learning. In fact, with the presence of ICTs in learning optimally to open insights, participants learn to understand the subject matter that is microscopic, abstract and complex. This is the role of ICT can be interpreted as a source of learning.

Fernandez (2019) validated such notion which postulate that Technological Pedagogical Knowledge established how specific technologies employed in specific ways might alter teaching and learning. This entails being aware of the educational advantages and limitations of various technology instruments in relation to developmentally and disciplinarily suitable pedagogical designs and tactics. In order to reconfigure technologies for unique pedagogical goals, teachers must reject functional fixity and acquire the abilities necessary to see beyond the majority of typical usage. To advance student learning and understanding, rather than using technology for its own sake, TPK demands an innovative, forward-thinking, and open-minded approach to its use.

Technological Pedagogical Content Knowledge

Malik et al. (2018) opined that the term technology pedagogy content knowledge refers to a set of learning principles in which mastery of technology is integrated and inseparable from its constituent parts content, knowledge and pedagogy. It encompasses how teachers teach specific content-based material using technologies that would best support the student's needs and preferences. Alkalaki (2021) pointed out technological pedagogical knowledge and technological pedagogical content knowledge that this is a type of knowledge that is emerging and transcends the three "core" components, technology, pedagogy, and content. Content knowledge for technological pedagogy is a knowledge that results from how technology, pedagogy, and content interact understanding. Beneath truly relevant and highly proficient technology-based instruction, this differs from understanding each of the three ideas alone. Rather, technological pedagogical knowledge and technological pedagogical content knowledge is the cornerstone of successful technology-based instruction, necessitating comprehension of the technology-based conceptual representation; educational approaches that using technology to teach topics in a productive way and understanding what constitutes concepts learning style—hard or simple—and how technology might assist address some of the issues that students encounter; awareness of students' past learning and epistemological frameworks; and understanding of the potential uses of technologies. It's challenging to deliver quality instruction using technology. According to the framework, teaching/learning environments, pedagogy, content, and technology all have roles to play, both separately and collectively. In order to effectively use technology in education, a dynamic equilibrium between all the elements must be continuously created, maintained, and reestablished. It is important to remember that a variety of factors affect how this balance is achieved.

Teachers' Technological Proficiency

Currently, the global education system is currently accepting and incorporating the principles and values of technology. The school, as the establishment that offers learning and creates a nation's productive leader, is are confronted with the greatest problem of how they will completely absorb and welcome the progress of technology. Consequently, the challenge calls for all educators, to adopt keeping nature, modifications, and advancements brought about by the quick development and expansion of technology. Hence, it is important to determine the level of technological proficiency to fully understand the impact of digital integration in education. Among the domain of technological proficiency, this study undertakes to limit the measure the level of proficiency in terms of the following indicators: technology operation and concepts, social and ethical context and communication and integration by Biares (2021).

Operation and Concepts

Technology operation and concepts are a measure of competence, according to Tooker (2020), which will assist teachers exhibit their abilities and knowledge as well as understanding of concepts that are somewhat related to technology. It varies from the services, resources, and system that will help instructors and are essential to the good development of technology in the classroom. This validated the concepts laid down by Hero (2020) that of teachers which would foster rational, consistent perspectives on the nature of the subject that is anticipated and taught among students—are crucial to the teaching and learning of technology at the school level. It makes clear that teachers' views about what it is crucial for students to learn should be refined through skills, knowledge, and competency. Teachers' responses to the development of technology-based classroom experiences have a direct impact on how lessons are organized and how classroom strategies are developed to teach technological concepts and processes. More so, a great

emphasis gleaned towards maintaining the context of designing classroom-based resources with the application of ICT which helps improve students learning outcomes and thus, acquiring the set skills and knowledge in technology operations and concepts is important among teachers.

Social and Ethical Context

It has been part of many studies that social and ethical context of competency should be given importance in looking forward digital integration in school. According to Hero (2020) teachers need to be aware of the social and ethical ramifications of the use and development of new technologies. This is because many aspects of digital have ethical implications and all of them also generate social implications. Knowing these elements can help teachers better prepare their pupils to recognize and value the role that digital plays in the educational process. This was supported by Saubern et. al. (2020) whom opined that digital technology in education creates ethical issues mainly because it changes human action as it brings benefits and new possibilities as well as risks and new problems. In the academic setting, teachers need to understand the ethical and social implications in learning process as to promote equality, access, preservation and mutual respect in the use of information in technological platform. One must understand the responsibilities it bears in a digital culture while maintaining the ethical behavior in their professional practices. Hence, teachers among others must understand the concept of advocating, addressing, promoting, and developing social and ethical ICT responsibility.

Communication

Biares (2021) postulate that communication and technology do not have to be mutually exclusive. Technology can really improve communication skills in the age of digital communication since it makes it possible for people to practice written communication for a variety of audiences. Since technology is a given in most workplace settings, educators must learn how to communicate face-to-face during daily tasks and meetings as well as ensure they are informed of any school updates via email or digital postings. It is important to note that people's ability to communicate effectively and learn how to write messages that can be understood in a few characters or less has really improved because to technology and digital communication. It can be deduced that the profound ability to use technology in communication measure the capacity and proficiency of educators in incorporating technology in their daily and routinely duties and responsibilities.

Integration

As technology becomes more and more integrated into our daily lives, educators are also looking for tactics and materials that use technology to enhance the educational experience for students. Studies show that superior professional growth and digital standards. Personalized learning strategies and content-based instruction can raise student achievement. critical-thinking abilities, as well as giving them access to education chances that would otherwise be impossible to obtain (Biares, 2021). This was supported by Phan et al. (2021) who opined that the job of educators in the classroom has been technologically challenged in today's digital culture them during the previous numerous years. Innovative technology resources, such as interactive films and digital lighting Projectors for processing data and other important components of digital learning have grown more common in the middle of its fundamental urge to millennial students. Alongside this, educators need to explore cutting-edge pedagogical approaches and how to successfully incorporate them into the classroom and utilize these techniques with the latest digital educational tools. There is strong reason to believe that Filipino teachers share the sentiments to improve capabilities in terms with digital knowledge and proficiency. However, it cannot be denied that scarcity of ICT facilities and resources such as limited number of computers, slow internet services have hindered the effective integration of technology in education. Nevertheless, the reality that teachers are considered novice in this area cannot be neglected. Hence, this study will undertake a deeper look on the proficiency of teachers in terms with application of technology.

Theoretical Framework

This study made use of Wang et al. (2021) Planned Behavior Theory. It deals with the intention for use of a new technology. It assumes that for an individual to adopt an innovation, he must display the willingness to use the said innovation. Three (3) independent variables are identified by the theory as having an impact on an innovation's adoption. The first variable is attitude towards the behavior which refers to the extent to which an individual is for or against the behavior in question. The second variable is subjective norm which refers to the perceived social pressure to perform or not perform behavior. This shows how the environment may affect someone to act in a particular way. Lastly, the model considers perceived behavior control as the third variable. This has to do with how easy or hard an activity is seen to be performed. Perceived behavior control is assumed to reflect experiences as well as anticipated impediments and obstacles.

Teachers who have embraced using technology in their daily work may find this concept useful. The willingness to use technology coupled with the current trend of using Its among peers for teaching and learning process could make teachers start using technology. The continuous reduction in complexity on the use of Its has led to a

growing number of users including teachers. The theory of planned behavior therefore informs the use of Its in teaching and learning process among teachers.

Ryan and Worthington (2021) emphasized that Theory of Planned Behavior primary goal aimed to comprehend how purpose affects behavior modification. It is believed that a crucial factor influencing individual's intention to carry out a behavior is known as its execution. Three different sets of beliefs further define it: (1) beliefs regarding the likely consequences of the behavior, which result in positive or negative attitudes toward the behavior; (2) beliefs regarding the expectations of others and the drive to live up to them, which lead to the perception of subjective norms or social pressures to execute that action; and (3) views on both internal (such as knowledge, skills, and capacities) and external (such as views regarding infrastructure, staff who are helpful and have access to computers), which are related to the power or convenience of carrying out an action (or behavioral control that is perceived). These three factors work together to establish a person's intention to engage in a behavior. The theory has been validated by numerous empirical researches to explain why technology use in higher education is planned as well as attempts to expand the initial model in order to increase its capacity to explain behavioral intention.

Ajzen's Theory of Planned Behavior states that attitude predicts behavioral intention. in relation to the behavior, the perceived behavioral control, and the subjective norm. Prior research, findings that explain teachers' motivations to employ technology. According to Gomez-Ramirez et al. (2019) focused on the concept that Intentions and classroom behavior of teachers have also been explained by the TPB, take for instance, the TPB has been specifically used to forecast K–12 teachers' intentions toward educational technology usage. Findings from these kinds of studies may assist direct strategies for encouraging teachers to adopt technology.

Hence, ICT is viewed as having three main roles in education: (1) as a competency when it is viewed in terms of technology-related skills (2) as a delivery mechanism when it is viewed to provide and enhance learning opportunities such as distance learning and mobile learning and (3) mobile technology as a means of delivering literacy and numeracy programs, given the high penetration of mobile devices in under-resourced areas. Aside from the pedagogical benefits, there are social and economic factors that motivate technology infusion in schools. John (2018) noted that the ability to use modern technology is essential in preparing a people for competition in a global workplace. Technology exposure prepares students for future employment, when it may be expected that they would utilize ICT to boost output, save expenses, and enhance outcomes. Finally, digital technology in education tend to decrease the social and intellectual inequalities among schools and their respective graduates.

Statement of the Problem

This study aimed to determine the level of teachers' knowledge on digital technology and their proficiency in the Division of Iligan City, School Year 2023-2024. Specifically, it sought to answer the following problems:

1. What is the respondent's profile in terms of position, highest educational attainment, and teaching experience?
2. What is the respondents' level of knowledge on digital technology based on technological knowledge , pedagogical knowledge, content knowledge , pedagogical content knowledge, technological content knowledge, technological pedagogical knowledge; and technological pedagogical content knowledge?
3. What is the respondents' level of technological proficiency considering operation and concepts, social and ethical context, communication and integration?
4. Is there a significant relationship between teachers' knowledge on digital technology and their proficiency?
5. Is there a significant difference in the teacher's knowledge on digital technology and their proficiency when grouped according to their profile?
6. Based on the findings of the study, what teachers' training design on knowledge on digital technology can be designed?

Scope and Limitations

The study focused on teachers' knowledge on digital technology and their proficiency in the Division of Iligan City, School Year 2023-2024. The respondents of the study were supposedly three hundred sixteen (316) public elementary school, teachers taken from the population. But because of some reasons that two (2) were on maternity leave; four (4) were on sick leave, the rest were on vacation leave and Special Science Teachers. This actual respondents were the three hundred (300) teachers. The independent variables were limited to teachers' knowledge on digital technology such technological knowledge , pedagogical knowledge, content knowledge, pedagogical content knowledge, technological content knowledge, technological pedagogical knowledge, technological pedagogical content knowledge. Further, dependent variable are limited to teachers technology proficiency such as operations and concepts, social and ethical context, communication, and integration. Moreover, the respondents profile are limited to position, highest educational attainment and teaching experience.

METHODOLOGY

Research Design

This study employed a descriptive correlation method as it aimed to draw concrete conclusions from the respondents. The descriptive data set forth from the quantifiable information or data gathered in relation to the specific problems presented in this study. Descriptive research is a type of quantitative study that is used to define traits or functions and test particular hypotheses, according to Fluet (2020). He continued by saying that the research issue or problem for this kind of study should be precise and explicit. Data for this study will be gathered using questionnaires and in-depth interview. This data was used to develop a descriptive assessment as a basis for an action plan or training design. The study was correlational because it established significant relationships between the variables undertaken, especially when grouped according to respondent profiles. The researcher implemented surveys and key interviews with the research respondents. The primary source of information for this study was the completed questionnaires, while secondary data were taken from books, relevant library topics, the internet, and other previous studies.

Study Setting

The Department of Education (DepEd) Division of Iligan City is responsible for overseeing public elementary and secondary schools within the city. As an urbanized area in Northern Mindanao, Iligan City has a diverse educational landscape, with schools that vary in technological access and digital literacy programs. This study focuses on assessing teachers' knowledge and proficiency in integrating digital technology into their teaching practices within selected public elementary schools in the division. This study was conducted in selected Public Elementary Schools in the Division of Iligan City under a Schools Division Superintendent and to the Assistant Schools Division Superintendent. The city is located on the coast of Northern Mindanao and is extensively urbanized. Iligan, a heavily urbanized city, is officially separate but often associated with the province of Norte. The city has a land area of 813.37 square kilometers (314.04 square miles). The population as of the 2020 census was 363,115. This accounted for 7.23% of the total population of Northern Mindanao. Based on these numbers, the population density is estimated as 446 persons per per square kilometer or 1,156 inhabitants per square mile.

This research included kindergarten to grade 6 teachers from selected public elementary schools in Iligan City, Lanao del Norte. The Division of Iligan City, established as a separate school division in 1964, operates under the Department of Education in the Philippines. Located in Northern Mindanao, Iligan City is bounded by Misamis Oriental to the north, Bukidnon and Lanao del Sur to the east, and Lanao del Norte to the South.The city covers an area of approximately 81,337 square kilometers and comprises 44 barangays. It chartered city on June 16, 1950, under RA 525, which includes the establishment of Iligan City as a distinct School Division. The Municipal Board enacted Resolution No. 208 in 1963, which separated Iligan City Division from Lanao del Norte.

Research Respondents and Sampling Technique

The participants of this study were the three hundred (300) teachers from Kindergarten to Grade 6, in the nine (9) selected central schools in South II District and Central District, Division of Iligan City. These teachers were currently teaching in School Year 2023-2024 in the schools where this study was conducted. They were included as respondents regardless of their position, teaching experience and educational qualification. This study utilized a universal sampling where all the respondents in the populations were involved. To ensure an appropriate number of respondents from each grade level, a random sampling procedure was employed. The distribution of these respondents is shown in Table A. While all teachers in the Division of Iligan were initially considered, the researcher will only select 300 teachers as respondents. This study included teachers from elementary schools representing different education levels. Teachers of diverse subject areas were included to capture a comprehensive view of research competence and development. Both experienced educators and newer teachers participated, allowing for a diverse range of perspectives.

Research Instrument

The research questionnaire is designed to gather valuable insights on the teachers' knowledge on digital technology and their proficiency in the Division of Iligan City. The questionnaire is divided into three (3) parts: The first part dealt with the teacher's profile in terms of position, highest educational attainment and teaching experience. The second part of the questionnaire inquired on the teachers' knowledge on digital technology based on Technological knowledge, pedagogical knowledge, content knowledge, pedagogical content knowledge, technological content knowledge, technological pedagogical knowledge, technological pedagogical content knowledge. This was patterned and modified from the study of Pilapil and Corpuz (2024). Teachers rated their competence in various aspects of research using the following scale: inadequate, less adequate , adequate, and very adequate. The third part of the questionnaire dealt on the teachers technological proficiency about the operation and concepts, social and ethical context, communication and the integration. This was patterned and modified from the study of Hero (2020) and Biares (2021). This allows to understand the level of research activity among teachers.

Statistical Treatment of Data

In order to determine the results of the gathered information, the researcher carefully recorded and tabulated the results of the survey, using descriptive and inferential statistical tools: Frequency and percentage which are the

basic descriptive tools were used to describe the respondents profile. Meanwhile, mean and standard deviation were used to analyze the level of teachers' knowledge and proficiency on digital technology. Pearson Product Moment of Correlation was the inferential statistical tool employed to identify the significant relationship between teachers' knowledge on digital technology and their proficiency. Analysis of Variance (ANOVA) and F-test were utilized to validate the significant difference on teachers' knowledge on digital technology and their proficiency when grouped according to their profile. This test was chosen because the variables and the data set meet the necessary assumption of the aforementioned inferential tests.

Ethical Consideration

It is crucial to ensure the privacy and anonymity of the teachers who participated in this research. Teachers were likely more inclined to participate honestly and openly if they were assured that their identities and personal information would be kept confidential. The researcher had obtained permission from all participating teachers. The purpose of the study, the data collection process, and how the information would be used were clearly explained. This ensured that they had the option to withdraw from the study at any time without facing consequences. Further teachers were asked to remove or replace any personally identifiable information (such as names, school names, or contact details) from the data during analysis and reporting. Pseudonym assignments may have been done to participants to protect their identities. In addition, to secure the data, the collected data was safeguarded by storing it securely, using encryption where necessary and limiting access to authorized personnel only. This ensured the data was not accidentally disclosed to unauthorized parties. Finally, for ethical review, ethical approval was sought from an institutional review board or ethics committee to ensure that the research design and data handling procedures met ethical standards and guidelines.

RESULTS AND DISCUSSION

Problem 1. What is the respondents profile in terms of position, highest educational attainment, and teaching experience?

Table 1
Distribution of Respondent's Profile in terms of Position

Category	Frequency	Percentage
Master Teacher III	3	1.00
Master Teacher II	4	1.34
Master Teacher I	22	7.33
Teacher III	126	42.00
Teacher II	34	11.33
Teacher I	111	37.00
Total	**300**	**100.00**

Table 1 shows the distribution of respondents' profiles in terms of position, categorized into Master Teacher III, Master Teacher II, Master Teacher I, Teacher III, Teacher II, and Teacher I. The data indicates that Teacher III is the highest mean in terms of teaching position with **126 (42%)** respondents. This means that this insight highlights the predominant role of mid-level teaching positions within the sampled educators, revealing a significant presence of teachers who have surpassed the initial stages of their careers and are more experienced. This result, also, suggests that schools may benefit from the expertise and stability these mid-level teachers provide, as they often bring valuable insights into instructional practices and student engagement strategies. Additionally, the prevalence of Teacher III positions may indicate effective professional development pathways that encourage teachers to advance in their careers, fostering a culture of growth and continuous improvement. However, the lower representation of higher-level positions, such as Master Teachers, may point to a need for targeted leadership development programs to cultivate future educational leaders within the institution. Research indicates that investing in leadership development for experienced teachers can lead to improved school performance and student outcomes. For instance, a study by Usmanov (2024) found a significant positive relationship between instructional leadership practices and both teacher professional development and student academic performance in senior high schools. This underscores the importance of targeted leadership development programs in enhancing educational quality.

Overall, understanding the distribution of teaching positions can inform administrative decisions regarding mentorship, professional development, and resource allocation to optimize educational outcomes. This insight highlights the predominant role of mid-level teaching positions within the sampled educators, revealing a significant presence of teachers who have surpassed the initial stages of their careers and are more experienced. This finding suggests that a substantial portion of the respondents hold considerable experience, which could influence the overall perspectives and insights captured in the research. Educational policies, professional development initiatives, or interventions derived from the research may have a more direct impact on Teacher III professionals. Additionally, researchers and education stakeholders should be mindful of potential differences in experiences and needs between individuals in different teaching positions. The distribution of teacher experience levels within a school system can

significantly influence the effectiveness of professional development initiatives. As shown in Table 1, this particular sample demonstrates a prevalence of more experienced teachers (Teacher III). This pattern aligns with research by García and Weiss (2019) and McLean et al. (2019), who identified the importance of experienced teachers in shaping educational outcomes and supporting school environments.

Table 2
Distribution of Respondents in terms of Highest Educational Attainment

Category	Frequency	Percentage
Doctoral Degree	6	2.00
Master's Degree with Doctoral Units	14	4.67
Master's Degree	87	29.00
Bachelor's Degree with MA Units	159	53.00
Bachelor's Degree	34	11.33
Total	**300**	**100.00**

Table 2 illustrates the distribution of respondents' highest educational attainment. The data show that participants with a Bachelor's Degree with MA Units represent the highest educational attainment, with a frequency of **159 (53%)**. This means that pursuing MA units indicates a commitment to continuous professional development. This data underscores the prevalence and significance of advanced academic achievements among the surveyed population. This implies that data suggests a culture of ongoing education and professional development within the teaching community, driven by the need to meet these criteria. Additionally, exploring the specific motivations and goals of individuals with Master's Degree Units can provide a more nuanced understanding of their educational and career trajectories. Understanding why these individuals pursue advanced education to a certain extent but not complete a full degree could offer insights into their professional aspirations, the perceived value of advanced education, and the practical considerations influencing their decisions.

Recent studies underscore the effectiveness of literacy programs that integrate technology, particularly those utilizing digital storytelling and gamified learning applications. For instance, a study by Wei et al. (2024) explores how gamified learning adventures can enhance literacy among primary school English teachers, highlighting increased engagement and pedagogical innovation. Similarly, research by Li et al. (2024) demonstrates that mobile gamified applications significantly improve early childhood literacy outcomes, including phonemic awareness and reading comprehension, by fostering higher student engagement. Moreover, a study by Ingersoll, Merrill, and Stuckey (2018) found that educators pursuing graduate-level coursework are more likely to engage in reflective practices and innovative teaching strategies, contributing to overall educational quality. These findings align with the data, highlighting the importance and impact of advanced academic achievements within the teaching profession.

The high frequency of respondents with Master's Degree Units reflects the alignment of their educational pursuits with career advancement requirements, emphasizing the importance of continuous professional development in the teaching profession. Exploring the motivations behind this trend can provide deeper insights into teachers' educational and professional goals.

Table 3
Distribution of Respondents in terms of Teaching Experience

Category	Frequency	Percentage
21 years and above	96	32.00
16 years to 20 years	53	17.67
11 years to 15 years	61	20.33
6 years to 10 years	48	16.00
1 year to 5 years	41	13.67
less than 1 year	1	0.33
Total	**300**	**100.00**

Table 3 showcases the distribution of respondents based on their teaching experience. The result reflected that the highest frequency of **96 (32%)** falls into the category, "**21 years and above**." This implies that the data emphasizes a significant presence of seasoned educators which means a high level of expertise, adaptability to educational changes, a role as a mentor, a deep commitment to the profession, continuous professional development, and significant contributions to student growth and the educational community. This aligns with the findings of the Australian Institute for Teaching and School Leadership (AITSL), which reported that Australia's teacher workforce is experienced. However, there was an increase in the proportion of newer teachers from 2021 to 2022, with a larger proportion of teachers having less than 20 years of experience in 2022 compared to previous years. With over two-

thirds (70%) of respondents having taught for more than a decade, the data reveals a population rich in pedagogical knowledge and practical expertise (Table 3). This experienced workforce, as highlighted by Gore et al. (2023), brings valuable insights and contributes significantly to the stability and effectiveness of the educational system. Their study found that teaching quality improves with years of experience, particularly when educators engage in structured professional development and collaborative practices. However, it's crucial to acknowledge potential challenges associated with an aging teacher population, such as resistance to adopting new instructional methods or a decline in energy levels (Wei et al., 2024).

Problem 2. What is the respondents' level of knowledge on digital technology based on technological knowledge, pedagogical knowledge, content knowledge, pedagogical content knowledge, technological content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge?

Table 4
Summary of Respondents Level of Knowledge on Digital Technology

Variables	Mean	SD	Interpretation
Technological Knowledge	3.17	0.56	High
Pedagogical Knowledge	3.68	0.41	Very High
Content Knowledge	3.37	0.42	Very High
Pedagogical Content Knowledge	3.38	0.46	Very High
Technological Content Knowledge	3.31	0.50	Very High
Technological Pedagogical Knowledge	3.46	0.47	Very High
Technological Pedagogical Content Knowledge	3.50	0.50	Very High
Overall	**3.41**	**0.39**	**Very High**

Legend: 3.26-4.00 Very Adequate/Very High 1.76-2.50 Less Adequate/Lower
2.51- 3.25 Adequate/High 1.00-1.75 Inadequate/Very Low

Table 4 presents the distribution of respondents' level of knowledge on digital technology based on teachers' knowledge on digital technology, focusing on various knowledge domains. The overall mean score of **3.41 (SD = 0.39)**, described as **Very Adequate**, and interpreted as **Very High**. This means that the teachers are confident in integrating technology across different aspects of instruction. This comprehensive assessment encompasses technological, pedagogical, content, and combinations of knowledge domains. The means that the lower standard deviation indicates a consistent level of confidence among respondents, reflecting a widespread perception of proficiency in technology integration. However, some variability exists, particularly in the area of Technological Knowledge, indicating room for improvement in specific domains.

Moreover, the result underlines the need for teachers to continuously improve their ability to use technology in the classroom. This echoes the idea put forth by Mishra and Koehler, (2018) that teachers need to have a strong understanding of technology (technological knowledge), how to teach (pedagogical skills), and the specific content they are teaching (content knowledge). They argue that these three areas of knowledge work together and are all essential for teachers to successfully integrate technology into their lessons.

Research indicates that all models of technology use in education are subject to rapid changes, not only in the technology itself but in the instructional practices around it (Mouza et al., 2020). Teachers with strong technology integration skills demonstrate more effective instructional practices and foster greater student engagement. Focused professional development empowers educators to design dynamic and innovative learning environments that better prepare students for a technology-driven world.

A closer examination of the results reveals that the variable, ***P*edagogical Knowledge**, has the highest mean of **3.68 (SD = 0.41),** described as **Very Adequate**, and interpreted as **Very High**. This implies that teachers participating in this study reported a high level of confidence in their teaching abilities. This is evidenced by the high average and the low standard deviation in their responses. A high average indicates that most educators felt confident, while a low standard deviation suggests a consistent level of confidence across the group. In other words, there wasn't a large variation in how confident educators felt – most reported feeling equally sure of their skills. This confidence likely stems from a strong foundation in pedagogical knowledge. After all, effective teaching hinges on having the skills to develop engaging strategies and manage classrooms efficiently. This means that the consistency in self-assessment across the group suggests that teacher education programs are equipping graduates with these essential skills. However, the need for continuous learning remains. While educators feel confident in their current skillset, ongoing support and training focused on innovative teaching methods can further enhance their capabilities (Santos, 2023). This ensures educators stay up-to-date with the latest approaches and can adapt to evolving student needs.

On the other hand, the variable, **Technological Knowledge**, shows the lowest mean of **3.17 (SD = 0.56),** described as **Adequate**, and interpreted as **High**. This means that teachers feel reasonably competent in their understanding and use of technology. However, the higher standard deviation indicates variability in their self-assessments, pointing to a wide range of technological proficiency among the respondents. This, also, implies that there still is a potential area for improvement among educators. This translates to a situation where, on average,

teachers feel less confident in their ability to use technology in the classroom. This could contribute to the idea of needing targeted professional development programs. These programs should be specifically designed to address the identified gaps in technological knowledge. Ideally, these programs would provide educators with the necessary skills and experience to feel comfortable and confident using technology in their teaching.

The finding, also, underscores the critical importance of a strong foundation in technological knowledge. Research by Velez and Jimenez (2024) emphasizes that teachers with a solid grasp of technology can effectively integrate it into their teaching practices. Technology, when used thoughtfully, can enhance learning experiences, personalize instruction, and improve student engagement.

Problem 3. What is the respondents' level of Technological proficiency considering operation and concepts, social and ethical context , communication and integration?

Table 5
Summary of the Respondents Level of Technological Proficiency

Domains	Mean	SD	Interpretation
Operation and Concepts	3.38	0.48	Very High
Social and Ethical Context	3.29	0.55	Very High
Communication	3.35	0.55	Very High
Integration	3.55	0.68	Very High
Overall	**3.39**	**0.48**	**Very High**

Legend: 3.26-4.00 Strongly Agree/Very High 1.76-2.50 Disagree/Low
2.51- 3.25 Agree/High 1.00-1.75 Strongly Disagree/Very Low

Table 5 shows distribution of respondents' level of technological proficiency based on **Domains**. It registered an overall mean of **3.39 (SD=)0.48)**, described as **Strongly Agree**, and interpreted as **Very High**. This implies that the respondents feel comfortable using technology for various tasks, including basic operations, troubleshooting, and exploring new tools. The consistency in these self-assessments reflects a well-prepared teaching workforce ready to leverage technology in their classrooms. This means that they have solid understanding of technological concepts. According to Moeller (2022), such proficiency is essential for creating a modern, dynamic educational environment where technology is seamlessly integrated into teaching methodologies. This overall proficiency signifies that teachers are well-equipped to utilize technological tools to facilitate better student engagement, personalized learning experiences, and more effective communication.

The domain of **Integration** received the highest mean score of **3.55 (SD=0.68),** described as **Strongly Agree**, and interpreted as **Very High**. This implies the need for continuous professional development and targeted support to ensure all educators can confidently and effectively utilize technological instructional materials. Effective integration of technology is vital for modern education, as it enables teachers to create interactive lessons that cater to various learning preferences and needs, enhancing student motivation and participation. This means that teachers feel particularly confident in their ability to incorporate technology into their teaching practices. Despite a higher variability in responses (SD: 0.68), this indicates that while many teachers excel in this area, others may face challenges. Dockstader (2019) emphasizes that the ability to facilitate various technological materials is crucial for creating engaging and dynamic learning environments that cater to diverse learning styles. Batan et al. (2022) also underscore the importance of assessing competencies in technology operation and concepts among teachers, revealing a strong correlation between proficiency in digital tools and effective teaching.

The domain of **Social and Ethical**, obtained the lowest mean of **3.29 (SD: 0.55),** described as **Strongly Agree**, and interpreted as **Very High**. This implies that the respondents are aware of the importance of social and ethical considerations in technology use but may feel less confident or experienced in this area compared to other indicators. This score indicates that while teachers value the principles of social responsibility and ethics in technology, there may be gaps in their understanding or implementation of these concepts in their instructional practices. Consequently, this finding highlights the need for targeted professional development to strengthen educators' knowledge and skills regarding ethical and social issues related to technology in education. This means that respondents strongly agree with their knowledge and practice of social and ethical aspects of digital technology. This includes issues such as digital citizenship, online privacy, ethical use of information, and the impact of technology on society. The standard deviation of 0.55 indicates moderate variability in responses. Teachers' awareness of these social and ethical considerations is essential for creating a safe and responsible digital learning environment (Guzman and Dela Cruz, 2022; Reyes et al., 2023). This proficiency helps in guiding students to use technology responsibly and ethically, reinforcing the importance of social and ethical standards in education.

Problem 4. Is there a significant relationship between teachers' knowledge on digital technology and their proficiency?

Table 6
Result of the Test on Relationship Between Teacher Knowledge of Digital Technology and their Proficiency

Teachers' Knowledge on Digital Technology		Teachers Proficiency				OVERALL
		Operation and Concepts	Social and Ethical Context	Communication	Integration	
Technological Knowledge	*r-value*	**0.20**	**0.24**	**0.15**	**0.17**	**0.32**
	p-value	**0.001***	**0.001***	**0.001***	**0.001***	**0.001***
	Interpretation	**S**	**S**	**S**	**S**	**S**
Pedagogical Knowledge	*r-value*	**0.55**	**0.38**	**0.35**	**0.36**	**0.33 ***
	p-value	**0.28**	**0.21**	**0.43**	**0.38**	**0.001**
	Interpretation	**NS**	**NS**	**NS**	**NS**	**S**
Content Knowledge	*r-value*	**0.41**	**0.12**	**0.07**	**0.40**	**0.38**
	p-value	**0.01***	**0.39**	**0.06**	**0.05***	**0.001***
	Interpretation	**S**	**NS**	**NS**	**S**	**S**
Pedagogical Content Knowledge	*r-value*	**0.45**	**0.51**	**0.30**	**0.20**	**0.37**
	p-value	**0.02***	**0.51**	**0.70**	**0.03***	**0.001***
	Interpretation	**S**	**NS**	**NS**	**S**	**S**
Technological Content Knowledge	*r-value*	**0.52**	**0.46**	**0.34**	**0.30**	**0.33**
	p-value	**0.01***	**0.004***	**0.11**	**0.28**	**0.001***
	Interpretation	**S**	**S**	**NS**	**NS**	**S**
Technological Pedagogical Knowledge	*r-value*	**0.66**	**0.36**	**0.33**	**0.61**	**0.61**
	p-value	**0.03***	**0.01***	**0.07**	**0.11**	**0.001***
	Interpretation	**S**	**S**	**NS**	**NS**	**S**
Technological Pedagogical Content Knowledge	*r-value*	**0.49**	**0.29**	**0.26**	**0.36**	**0.37**
	p-value	**0.001***	**0.05***	**0.74**	**0.001***	**0.001***
	Interpretation	**S**	**S**	**NS**	**S**	**S**
OVERALL		**0.50** **0.001*** **S**	**0.53** **0.001*** **S**	**0.48** **0.001*** **S**	**0.35** **0.001*** **S**	**0.51** **0.001*** **S**

Legend: *significant at p<0.05 alpha level S – significant NS – not significant

Table 6 reveals a consistent, statistically significant positive relationship between teachers' knowledge of various aspects of digital technology and their technological proficiency. Correlation values range from modest (e.g., r = 0.32 for technology knowledge, r = 0.33 for pedagogical knowledge) to stronger relationships (e.g., r = 0.61 for technological pedagogical knowledge), all with p-values less than 0.001, indicating results are unlikely due to chance. These findings underscore that as teachers increase their knowledge—whether in content, pedagogy, or technology—their proficiency in using technology for educational purposes tends to improve. However, the strength of these relationships varies, with the strongest link observed when pedagogical strategies are integrated with technological knowledge.

Despite the positive correlations, the relationships are generally moderate, indicating that knowledge alone does not fully determine technological proficiency. Other influencing factors include hands-on practice, access to technology, professional development, school leadership, and individual teacher comfort with technology. The study highlights the importance of a multifaceted approach to enhancing proficiency, which combines theoretical knowledge with practical, contextualized experiences. Professional development programs should not only deliver content but also foster real-world application through collaboration, coaching, and iterative experimentation in classrooms.

A holistic framework is essential to support teachers in becoming proficient users of educational technology. This means integrating content knowledge, pedagogical strategies, and technological tools into a cohesive model—such as Technological Pedagogical Content Knowledge (TPACK)—to empower teachers to design effective, engaging lessons. Studies cited throughout the analysis emphasize that training must be comprehensive and ongoing, addressing both theoretical and applied aspects of teaching with technology. With the right support, including leadership, infrastructure, and professional learning communities, schools can better equip educators to leverage digital tools for improved student outcomes.

Problem 5. Is there a significant difference in the teacher's knowledge on digital technology and their proficiency when grouped according to their profile?

Table 7
Difference in the Teachers' Knowledge on Digital Technology when Grouped according to their Profile

Respondents Profile		Teachers' Knowledge on Digital Technology							OVERALL
		Technology Knowledge	Pedagogical Knowledge	Content Knowledge	Pedagogical Content Knowledge	Technological Content Knowledge	Technological Pedagogical Knowledge	Technological Pedagogical Content Knowledge	
Position	**f-value**	**6.6**	**2.1**	**13.32**	**6.91**	**8.86**	**9.98**	**3.66**	**4.71**
	p-value	**0.001**	**0.06**	**0.001**	**0.001**	**0.001**	**0.001**	**0.003**	**0.001***
		S	**NS**	**S**	**S**	**S**	**S**	**S**	**S**
Highest Educational Attainment	**f-value**	**15.75**	**1.31**	**21.68**	**9.95**	**10.74**	**9.38**	**4.62**	**5.71**
	p-value	**0.10**	**0.001**	**0.001**	**0.003**	**0.005**	**0.008**	**0.001**	**0.001***
		NS	**S**	**S**	**S**	**S**	**S**	**S**	**S**
Teaching Experience	**f-value**	**2.03**	**0.2**	**3**	**4.97**	**4.31**	**3.74**	**1.55**	**1.2**
	p-value	**0.12**	**0.80**	**0.17**	**0.11**	**0.13**	**0.78**	**0.30**	**0.35**
		NS	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

Legend: *significant at p<0.05 alpha level S – significant NS – not significant

Table 7 shows the summary of the test results in teachers' knowledge on digital technology when grouped according to respondents' profiles. The computed p-value is less than the p-critical value at 0.05 level of significance. Thus, the null hypothesis is rejected. For **teaching position** this means that there is a strong relationship f-value of **4.71(p < 0.001)** between teaching position and technology knowledge, with higher-ranked teachers exhibiting greater technological proficiency. This implies that leadership roles may provide more opportunities for professional development, allowing these educators to enhance their technological skills. A closer look at the **teaching position** reveals its profound impact on various dimensions of educators' knowledge and skills, particularly in the realms of technology, pedagogy, and content expertise. As the educational landscape increasingly integrates technology into teaching practices, understanding how these factors interplay becomes essential. The analysis of teaching positions concerning technology knowledge, content knowledge, and pedagogical content knowledge, among others, highlights significant disparities among educators. Higher-ranked teachers, such as Master Teachers, consistently demonstrate superior proficiency across these knowledge areas, suggesting that their roles provide unique opportunities for professional growth and development. This insight invites a deeper exploration of how teaching positions influence educators' capabilities and, ultimately, student outcomes in an increasingly digital learning environment. Ertmer et al. (2020) emphasize that teachers in leadership positions often have greater access to training, reinforcing the need for institutional support to ensure all educators can improve their technology knowledge.

As for **Highest Educational Attainment**, this means that educational qualification has a significant effect f-value of **5.71 (p < 0.001),** indicating that advanced degrees contribute to better understanding and application of pedagogical strategies. This implies that educators with higher qualifications are likely to employ more effective teaching methods. Examining the impact of **highest educational attainment** on teachers' knowledge domains provides valuable insights into how advanced education influences various competencies in the classroom. The analysis reveals that while technology knowledge does not show a significant relationship with highest educational attainment, other areas, such as pedagogical knowledge, content knowledge, and their intersections, exhibit significant correlations. This means that higher educational qualifications may enhance educators' abilities in pedagogical and content areas, thereby affecting their overall effectiveness in integrating knowledge into teaching practices. Wang et al. (2021) emphasize that advanced education equips teachers with essential pedagogical frameworks, leading to improved instructional practices.

The findings reveal that **highest educational attainment** significantly impact multiple knowledge domains, with advanced degrees correlating with higher proficiency in pedagogical and content knowledge. This underscores the importance of investing in continuous professional development and advanced education to equip teachers with the necessary skills for effective technology integration in teaching and learning contexts.

On the other hand, **teaching experience** this means that has a significant effect f-value of **1.2 (p < 0.35)** of teachers' knowledge of digital technology reveals important insights into how years in the classroom may influence technological proficiency. This implies that simply accumulating years in the classroom does not automatically enhance digital skills. As technology continues to shape the educational landscape, understanding the role of experience in developing digital skills is critical for fostering effective teaching practices. The ANOVA test results indicate a general lack of significant relationships across various aspects of technological knowledge and proficiency, prompting exploration of the implications of these findings. Research by Ertmer et al. (2020) emphasizes the necessity for ongoing professional development to address technology integration challenges, underscoring the need for educational institutions to provide structured programs that enhance digital skills for all educators.

Ultimately, the findings raise questions about the effectiveness of existing training programs and highlight the importance of tailored professional development initiatives. Jones and Dexter (2018) advocate for programs that align with teachers' technological pedagogical content knowledge to improve integration skills. By prioritizing comprehensive professional development focused on practical skills, educational leaders can foster a culture of continuous learning, ensuring that all educators are equipped to effectively utilize digital tools in their classroom.

Table 8
Difference in Teachers Technological Proficiency when Grouped according to their Profile

Respondents Profile		Teachers Technological Proficiency				
		Operation and Concepts	Social and Ethical Context	Communication	Integration	Overall
Position	f-value	**6.34**	**5.71**	**3.81**	**4.85**	**6.4**
	p-value	**0.001***	**0.001***	**0.002***	**0.001***	**0.001***
		S	**S**	**S**	**S**	**S**
Highest Educational Attainment	f-value	**7.19**	**8.38**	**0.08**	**2.2**	**8.29**
	p-value	**0.001***	**0.001***	**0.008***	**0.001***	**0.001***
		S	**S**	**S**	**S**	**S**
Teaching Experience	f-value	**4.22**	**2.98**	**4.17**	**0.98**	**3.5**
	p-value	**0.15**	**0.32**	**0.25**	**0.95**	**0.34**
		NS	**NS**	**NS**	**NS**	**NS**

Legend: *significant at p<0.05 alpha level S – significant NS – not significant

Table 8 presents the test results in teachers' knowledge on technological proficiency when grouped according to respondents' profiles specifically teaching position,highest educational attainment, and teaching experience. For **Teaching Position**, it registered an overall the f-**value is 6.4 (p < 0.001)**, since the p-value is less than 0.05 level, therefore, the null hypothesis is rejected. This means that there is a significant difference in technological proficiency knowledge based on teaching positions. This implies that teachers in certain roles, such as those in leadership or specialized positions, may have had more opportunities for professional development focused on digital technology. This aligns with the findings of Boz (2023), who discovered that teachers' participation in professional development programs for integrated STEM education significantly influenced their digital competency. The study underscores the importance of equitable professional development for all teaching positions to reduce disparities in digital competency.

For **Highest Educational Attainment**, it registered an overall the f-**value is 8.29 (p < 0.001)**, since the p-value is less than 0.05 level, therefore, the null hypothesis is rejected. This means that there is no significant difference in technological proficiency knowledge based on educational qualifications. This implies that teacher education programs may not consistently equip teachers with adequate technological skills across different qualification levels. For **Teaching Experience**, it registered an overall the f-**value is 3.5 (p < 0.34)**, since the p-value is less than 0.05 level, therefore, the null hypothesis is rejected. This means that there is a significant difference in technological proficiency knowledge based on teaching experience. This implies that newer teachers may have had more recent exposure to technological advancements, while more experienced teachers might rely on personal initiative to stay updated. Drossel et al. (2019) support this by showing that teaching experience alone is not a strong predictor of digital technology proficiency. Hsu (2023) emphasizes that professional development and personal interest in technology are more crucial than years of teaching, pointing to the importance of continuous, updated professional development for all teachers.

Problem 6: Based on the findings of the study, what Teachers' Training Design on Knowledge on Digital Technology can be designed?

Table 9
Matrix of Teachers' Training Design on Knowledge of Digital Technology

Year 1 (2024): Foundational Knowledge and Skills							
Area of Concern	**Specific Objectives**	**Strategies/ Activities**	**Time Frame**	**Persons Involved**	**Source of Funds**	**Estimated Budget (PHP)**	**Expected Output**
Technological Knowledge	Identify essential digital tools and platforms for education.	Hands-on sessions on using these platforms for classroom activities.	March 2024 (2 days)	ICT Coordinators, Trainers, and Teachers	MOOE School Budget, Stakeholders	50,000	Implementation of digital tools in classroom instruction.
	Build foundational knowledge and skills in digital technology.	Workshops, hands-on training sessions.	January 2024 (3 days)	ICT Coordinators, Trainers, and Teachers	DepEd Budget, Stakeholders	75,000	Basic digital literacy skills acquired
	Develop teachers' understanding of technological knowledge and its educational applications. Introduce foundational digital literacy skills. Cultivate a positive attitude toward technology integration.	Conduct introductory workshops, technology integration demonstrations, guest lectures, and provide online resources.	February 2024 (5 days)	ICT Coordinators, Trainers, and Teachers	DepEd Budget, Stakeholders	80,000	Enhanced understanding of technological concepts and practices.
Social and Ethical Contexts	**Identify and Explore Digital Tools.**	Hands-on activities using selected tools to familiarize teachers with their functionalities.	March 2024 (2 days)	ICT Coordinators, Trainers, and Teachers	MOOE School Budget, Stakeholders	40,000	Development of basic proficiency in using selected digital tools
	Introduce fundamental concepts of digital citizenship and ethical technology use.	Facilitate workshops on digital citizenship, conduct discussions on online ethics, and analyze case studies.	January 2024 (3 days)	ICT Coordinators, Trainers, and Teachers	MOOE School Budget, Stakeholders	40,000	Increased awareness of social and ethical considerations in technology use.
	Use Technology for Research and Inquiry.	Collaborative projects involving the design and implementation of small-scale research studies using digital tools.	February 2024 (5 days)	ICT Coordinators, Trainers, and Teachers	MOOE School Budget, Stakeholders	40,000	Teachers acquire skills to use technology for research and inquiry
Year 2 (2025): ADVANCE APPLICATION AND TECHNOLOGY							
Area of Concern	**Specific Objectives**	**Strategies/ Activities**	**Time Frame**	**Persons Involved**	**Source of Funds**	**Estimated Budget (PHP)**	**Expected Output**
Technological Knowledge	Enhance understanding of advanced technological concepts and applications.	Organize advanced workshops, engage in project-based learning, and invite guest speakers to share insights.	August 2025 (1 day)	ICT Coordinators, Trainers, and Teachers	MOOE School Budget, Stakeholders	75,000	Deeper knowledge of advanced technology applications in education.
	Foster a culture of collaboration and knowledge-sharing among educators in technology integration.	Establish online communities of practice for teachers to share resources, experiences, and best practices.	October 2025 (3 days)	School Administratorsand,ICT Coordinators	Deped Budget, Stakeholders	20,000	Increased collaboration and peer support in technology-enhanced teaching practices
	Enhance Technology Integration Skills.	Seminars on innovative pedagogical approaches for technology integration (e.g., flipped classroom, blended learning, gamification).	February 2025 (5 days)	ICT Coordinators, Trainers, and Teachers	Deped Budget, Stakeholders	60,000	Improved teaching strategies that effectively integrate technology
Social and Ethical Contexts	Promote ethical technology use and raise awareness of social	Host ethical debates, conduct case studies, and implement technology integration projects.	August 2025 (1 day)	ICT Coordinators, Trainers, and Teachers	MOOE School Budget, Stakeholders	45,000	Responsible and ethical use of technology in educational settings.

	implications. Develop critical thinking skills regarding technology.						
	Create accessible and inclusive digital learning environments.	Collaborative discussions on creating inclusive digital learning experiences.	October 2025 (3 days)	ICT Coordinators, Trainers, and Teachers	Deped Budget, Stakeholders	45,000	Developed resources for diverse learners.
	Explore and implement technologies that support diverse learners.	Workshops on assistive technology and accessible design.	February 2025 (5 days)	ICT Coordinators, Trainers, and Teachers	Deped Budget, Stakeholders	60,000	Strategies for using assistive technology.
Year 3 (2026): INTEGRATION OF TECHNOLOGY IN RESEARCH							
Area of Concern	**Specific Objectives**	**Strategies/Activities**	**Time Frame**	**Persons Involved**	**Source of Funds**	**Estimated Budget (PHP)**	**Expected Output**
Technological Knowledge	Facilitate the integration of digital technology into curriculum planning and delivery.	Develop model lesson plans integrating digital technology across subject areas and grade levels.	August 2026 (1 day)	ICT Coordinators, Trainers, and Teachers	MOOE School Budget, Stakeholders	20,000 - 30,000	Enhanced alignment between curriculum objectives and technology integration goals
	Attain proficiency in utilizing a variety of digital tools and platforms.	Facilitate hands-on workshops focused on digital tools, promote collaborative projects, and provide peer mentoring opportunities.	Septem-ber 2026 (2 days)	ICT Coordinators, Trainers, and Teachers	MOOE School Budget, Stakeholders	40,000	Enhanced confidence and competence in utilizing digital tools among educators.
	Achieve proficiency in effectively applying technological knowledge in the classroom.	Conduct advanced workshops on digital tools, implement integration projects, and establish peer mentoring.	February 2026 (5 days)	ICT Coordinators, Trainers, and Teachers	Deped Budget, Stakeholders	100,000	Increased confidence and competence in applying technology in teaching.
Social and Ethical Contexts	Reinforce ethical technology use and address relevant social and ethical considerations.	Engage in ethical reflection exercises and facilitate discussions on best practices in technology use.	August 2026 (1 day)	ICT Coordinators, Trainers, and Teachers	MOOE School Budget, Stakeholders	20,000	Strengthened ethical awareness and practices among educators.
	Provide ongoing support and updates on digital technology.	Online courses, regular update sessions.	Septem-ber 2026 (2 days)	ICT Coordinators, Trainers, and Teachers	Deped Budget, Stakeholders	80,000	Sustained professional growth
	Assess the effectiveness of training and gather feedback for improvement.	Surveys, focus groups, performance assessments.	February 2026 (5 days)	ICT Coordinators, Trainers, and Teachers	Deped Budget, Stakeholders	100,000	Data driven improvements in training design

Conclusion

Based on the results and discussions presented, the following conclusions are drawn:

A closer look at teaching positions, educational attainment, and teaching experience reveals the diverse landscape within the educational sector. The educators in the early to mid-stages of their career ladder, particularly in Teacher I and Teacher III positions, suggests a dynamic workforce with opportunities for career advancement. Moreover, the prevalence of educators with Master's Degree Units highlighting the importance of fostering supportive structures to encourage full degree completion and aligning with evolving career criteria.

The integral role of pedagogical knowledge was highlighted, emphasizing its impact on teachers' confidence and proficiency in using technology and the high mean scores for pedagogical knowledge suggest that teacher education programs effectively equip educators with essential pedagogical skills.

Moreover, there was a positive significant relationship between teachers' knowledge on digital technology and their proficiency. The respondents demonstrated a moderate understanding of digital technology, observed across various knowledge areas that the pedagogical knowledge and Integration exhibited the highest mean scores, indicating strong foundational skills. In terms of technology integration, the high confidence levels among teachers indicate their

readiness to incorporate digital tools into their practices. Therefore, essential for modern education and professional development initiatives that address both areas are crucial for fostering a capable and confident teaching.

Recommendations

Based on the conclusions drawn from the study, the following recommendations are proposed:

1. The Department of Education should conduct training programs that address a range of technological knowledge topics to and applicability in classroom settings for all teachers.

2. The Division Office of Iligan City, should utilize budgetary resources efficiently for the acquisition and maintenance of educational technology tools that are aligned with curricular objectives.

3. School Administrator should organizing regular professional development programs that focus on enhancing teachers' understanding and practical use of technology. Establishing mentorship programs can help support teachers in developing their technological skill to create responsible digital learning environments.

4. Teachers should participate in ongoing professional development programs that focus on real technology applications, participating in hands-on seminars that will help them gain confidence and skill with digital technologies.

5. Teachers are encouraged to utilize the training design formulated by the researcher to enhance proficiency in utilizing digital technology tools and resources.

6. Future researchers on the knowledge on digit teachers should be conducted by teacher in other places considering other variables to validate result.

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