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Creating A Culture of Technology Integration in the Teaching-Learning Process Among Intermediate Teachers in Daraga South District

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Abstract

21st-century education has been significantly shaped by the inclusion of technology into the teaching and learning process, which provides creative ways to improve instructional delivery, promote student involvement, and build necessary digital skills. Although national and international initiatives, including those spearheaded by the Philippine Department of Education, have underlined the need of ICT in education, many public schools—especially in rural areas—still struggle with major obstacles including inadequate access to digital tools, inadequate teacher training, and antiquated infrastructure. This paper looks at the difficulties intermediate-level teachers in the Daraga South District, Albay face incorporating technology into their classroom instruction. It seeks to evaluate teachers' technological skills, highlight how these issues affect student performance, and suggest solutions to assist a sustainable culture of technology integration. The study emphasizes the need of matching policy frameworks with the reality of under-resourced schools by drawing on local and regional knowledge, including ASEAN's ICT Master Plan 2020 and community-based projects like the TIP Model. The results underline the need of coordinated professional development, institutional support, and culturally sensitive policies to close the gap between policy and practice. In the end, this study aims to support long-term, scalable solutions that foster

INTRODUCTION

Using technology in the classroom is important for making lessons more interesting, improving teaching methods, and getting students ready for a digital world that is changing quickly. Many school systems, including the Philippines, have started using technology to help students learn from each other and fill in gaps in their knowledge. But having the right tools isn't enough to make integration work. To adopt, adapt, and come up with new ways to teach, teachers need to change the way they do things. But many public schools still have big problems that make it hard to use technology effectively in the classroom. For example, teachers aren't trained well enough and there isn't enough ICT equipment. These problems make it harder for students in grades 4–6 to learn how to think critically, solve problems, and use technology.

To make sure that all students can benefit from technology-enhanced learning, it is important that legislative goals are in line with what teachers in communities with few resources actually have to work with. How well technology is used in classrooms depends on things like the availability of resources, the skills of teachers, and the support of the institution. Studies show that creating a culture of technology integration is very important. This is more than just having digital tools; it also requires teachers to change the way they think about technology. To make a long-lasting, tech-driven teaching culture, it is important to study the experiences of intermediate teachers and the effects of professional development.

In 2024, Makbul et al. conducted a workshop in Cintalanggeng Village, Tegalwaru District, Karawang Regency, focusing on the Technology Integration Planning (TIP) Model for elementary school teaching materials. This initiative aimed to enhance teachers' digital literacy and pedagogical skills through a systematic and inclusive approach. The workshop included practical training on designing technology-integrated lesson plans, fostering professional development and collaboration among educators. Despite challenges such as limited infrastructure and internet connectivity, the program significantly improved teachers' competencies and contributed to the village's educational advancement.

Aligned with ASEAN's ICT Masterplan 2020, which emphasizes the role of ICT in enhancing education access and quality, this workshop serves as a model for integrating technology into teaching practices. The Masterplan advocates for digital literacy and infrastructure development to bridge educational gaps and prepare students for the digital economy.

The Department of Education (DepEd) launched the Digital Classroom Program (DCP) to modernize public schools with ICT tools. While urban schools have benefited, rural schools face challenges like limited infrastructure and maintenance issues. To address this, DepEd's Digital Rise Program promotes ICT integration through training and learning management systems, aiming to enhance digital literacy. However, obstacles such as device shortages and uneven teacher readiness persist.

Private organizations like EduTech Philippines support these efforts by providing teacher training and digital content. A study by Reyes et al. (2024) found that teachers in Daraga South District prefer blended learning, combining face-to-face and digital methods, for greater classroom flexibility.In summary, while DepEd's initiatives aim to integrate technology into education, challenges remain, especially in rural areas. Collaboration with the private sector and a focus on blended learning approaches are essential to overcoming these obstacles and enhancing the effectiveness of technology in education.

In the Daraga South District, the integration of technology into the teaching-learning process remains a significant challenge among intermediate teachers. While technology has the potential to enhance educational practices, many teachers face barriers such as varying levels of technological competence, limited access to resources, and outdated infrastructure, including unreliable internet connectivity and insufficient digital tools. Additionally, there is a lack of cohesive professional development programs and institutional support to help teachers improve their technological skills. The absence of a supportive culture for technology integration further compounds these issues, leaving teachers to navigate these challenges with little guidance or collaboration. This study aims to explore these challenges, assess the competencies of teachers, and propose interventions to foster a sustainable culture of technology integration that can benefit both educators and students in the district.

The research has the potential to have a wide-ranging and sustainable impact, in addition to the immediate benefits. Not only will the Daraga South District address current gaps, but it will also establish a foundation for continuous growth and adaptation through the establishment of a technology-integrated culture. This culture will continue to develop in tandem with the arrival of new technologies, guaranteeing that future generations of students and educators are prepared to meet the challenges of a constantly changing educational environment. Moreover, the results and intervention strategies of this study can be used as a model for other schools and districts that are confronted with comparable obstacles, thereby expanding its impact beyond the local context

Objectives of the study

This study aimed to explore and establish strategies for creating a culture of Technology Integration in the teaching-learning process among intermediate teachers in Daraga South District.

Specifically, this research sought to:

1. Assess the competencies of teachers in the use of information technology in the teaching-learning process.
2. Evaluate the challenges faced by the teachers in the integration of technology in the teaching-learning process.
3. Appraise the support extended in enhancing the teacher's competencies in the use of technology in the teaching-learning process.
4. Propose an intervention plan in creating a culture of technology integration in Daraga South District.

Assumptions

1. It is assumed that teachers in the Daraga South District have different levels of skill when it comes to using information technology. This is influenced by their previous exposure, training, and access to digital tools. Some teachers may have advanced skills and experience, while others may struggle with even basic technology use because they have limited resources or opportunities for professional development.
2. It is believed that teachers face a number of obstacles when it comes to integrating technology, such as inadequate training, limited access to devices, unreliable internet connections, and reluctance to adapt. Institutional and systemic factors, such as insufficient funding and inconsistent administrative support, make these challenges even more difficult.
3. It is assumed that the systems that support the improvement of teacher skills are either inconsistent or insufficient. Although there may be some training programs and resources available, they are likely to be inconsistent, not customized to meet the needs of teachers, or inadequate to meet the requirements of effective technology integration. In addition, teachers may not be taking full advantage of collaboration and peer support.
4. It is believed that a well-designed intervention plan can address the gaps and challenges that have been identified, thereby promoting a culture of technology integration. It is anticipated that this plan will include initiatives to build capacity, improve access to resources, and establish sustainable support systems. It is also assumed that teachers will be able to adopt and integrate technology into their practices more effectively if they are given sufficient training, resources, and encouragement. This will benefit both their professional development and their students' outcomes.

Literature Review

Students have been transformed into digital learners as a result of the rapid expansion of information and communication technologies (ICTs), which has necessitated the incorporation of technology into the instructional strategies that teachers employ. In order for this integration to be successful, the attitudes, technological knowledge, and skills of teachers are essential. Taking into consideration the findings of Pakistan's most recent five years of research, this study presents the perspectives of educators regarding the incorporation of technology into their teaching and learning practices across all educational levels. It is generally agreed upon by educators that the incorporation of technology into educational activities is beneficial. Through the use of technology, they believe that they are able to improve their teaching, make learning more enjoyable and interactive, and motivate their students.

The most significant obstacles to the incorporation of information and communication technology, according to teachers, are slow internet speeds, load shedding, a lack of infrastructure, a lack of experience teaching online, and training. The study suggests that the relevant authorities should establish policies that are both clear and effective in order to make efficient use of information and communication technology (ICT). This can be accomplished by allocating a sufficient budget and ensuring that all educational institutions have all of the necessary facilitation (such as ICT infrastructure, tools, software, internet, and labs).

Teacher Competencies in Information Technology Use

Today's teachers must master digital competence. Most models and frameworks focus on pre-university teachers, but there is growing interest in university teachers' digital competencies—the knowledge, skills, and attitudes needed to use technology effectively. This research presents a systematic review of the literature in the Web of Science and Scopes to identify, analyse, and classify digital competence articles published between 2000 and 2021 to find and improve research on digital skills and university teachers' futures. Using SciMAT for analysis. More than 343 English articles are found, 152 of which are duplicates and 135 unrelated to the study. This filtering yields 56 articles for detailed analysis. The results show that most research examines teachers' digital competency self-assessment and reflection. Teachers recognize their low or medium–low digital competence and lack of competencies, especially in educational practice evaluation. Despite multiple studies on this topic, research must be improved, teachers' digital competencies assessed, and more practical and personalize training programmes designed to meet their needs in the digital age. Matarranz, M.(2022)

A key factor in learning quality in the digital age is the integration of ICT into teaching practices. The COVID-19 pandemic has forced school closures, highlighting teachers' digital competence. We use a quantitative approach to assess the ICT competence of 260 secondary school teachers in the Directorate of Education in Rhamna, Morocco. Only 26.1% of our sample felt competent. Pandemic changed teachers' views on ICT integration and training in the field. A cross-analysis found significant relationships between ICT competence and six independent variables: continuous training, learning readiness, gender, age, teaching experience, and school subject. Our findings can help policymakers design educational policies that emphasize ICT continuous training to improve teachers' digital competence. Baytar, E. , et. Al. (2022)

Technology readiness and understanding its impact on student learning are essential skills for all teachers. The study assessed higher education teachers' information and communication technology competencies, focusing on technology operations and concepts. The study used a descriptive design, including a questionnaire based on the National ICT Competency Standard for Teachers. The study included 104 teachers from a state university in the Philippines as respondents, following the sample size estimation formula for a finite population. The questionnaire responses were encoded and analyzed in Microsoft Excel using descriptive statistics like frequency counts, percentages, and means. The study found that teachers have a basic understanding and effective use of internet and network resources. Teachers demonstrate basic competencies in information and data management. Teachers reported proficiency in computer operation, troubleshooting, maintenance, and productivity tools. Teachers can receive technology training to enhance their skills and competencies for effective teaching and learning. Batan, Michael B., et al. (2022)

In the twenty-first century, teachers' digital competencies have become increasingly important in improving educational quality. This study focused on the integration of technology in classroom activities, with data collected from secondary school teachers, principals, and pedagogical centre coordinators. The

findings revealed a high rating for the content, pedagogical, and pedagogical-content knowledge domains. Furthermore, all six knowledge domains, including technology, content, pedagogy, and their interactions, exhibited a positive and significant relationship with the Technology-Pedagogical-Content Knowledge (TPACK) application. The findings revealed that teachers' in-service training, attitude towards technology, technological and content knowledge, technology-pedagogical knowledge, and technological-content domains all predict TPACK application. Barriers to technology integration can be addressed through teachers' in-service professional development opportunities to enhance their confidence and competencies with technology. Furthermore, access to technological tools, administrative support, and expert mentoring and coaching on technology integration could boost digital technology adoption in the classroom, thereby improving student performance in this region. Demissie, E.et. Al, (2021).

ICT competency requires knowledge of technology and the ability to create effective technology-based lessons for learning. The current society values innovation and creativity, and this environment fosters interactive learning opportunities. ICT plays a crucial role in promoting lifelong learning. Furthermore, it encourages students to focus and pay attention in the classroom. In today's context, it is essential to have an innovative and creative learning environment that includes appropriate ICT competencies. NEP 2020 prioritizes emerging technologies such as artificial intelligence, machine learning, smart boards, handheld computing devices, and adaptive computer testing. The document emphasizes the importance of providing teachers with a diverse range of educational software to enhance teaching, learning, and assessment. To prepare for future innovative and creative teaching methods, it's important to examine current situations. Integrating ICT into the curriculum allows for more flexible and personalized learning experiences for both teachers and students.

The study of teacher preparedness and the evolving technological advancement within teacher education is crucial in recent times. This study explores the current state of teacher readiness in Colleges of Education (CoE) in Ghana. It focused on integrating technology into the teacher preparation programme by leveraging teachers' readiness and continuous professional development. A mixed-method approach was employed, involving 485 participants (469 tutors & 16 principals) selected from sixteen colleges using cluster, stratified and purposive sampling techniques. Quantitative data were collected through structured questionnaires, while qualitative data were sought through semi-structured interview schedules. The quantitative data were analyzed using descriptive and inferential statistics, and the qualitative data underwent inductive analysis. The findings indicated that factors like age, gender, higher qualifications, and professional experience influenced technology integration. Key tools such as smartphones and Microsoft Office 365 were insufficient for effective technology use, mainly due to infrastructural challenges and resistance to change. The study recommends resourcing teacher training institutions and regular in-service training by the Ministry of Education to equip CoE staff with the necessary skills for technology integration. Mpuangnan (2024)

Seven teachers from a small, suburban, Catholic K-8 school participated in the study, rating their concerns regarding the use of iPads in the classroom from lowest to highest. The Stages of Concern Questionnaire, Levels of Use observation rubric, and one-on-one interviews were utilized as data sources. Themes and patterns were identified through open and axial coding in the data analysis. The results suggested that teachers were not particularly concerned with the integration of iPad, as well as with the conflicts between their teaching responsibilities and their interests, and with the acquisition of additional training on classroom time and organization.

The results also showed that they had a high level of concern about the development of working relationships with fellow faculty members to maximize the benefits of iPad training, as well as about receiving additional iPad training. Lastly, the results suggested that teachers were apprehensive about the acquisition of additional iPads for pupils and the improvement of network connectivity within the school. These findings will assist administrators and designers in implementing positive changes to professional development that will enhance and increase the successful integration of mobile technology in the classrooms of instructors.

This study examined the way in which teachers perceive the efficacy of a blended learning program at a public charter middle school (5th-8th grade) in a major metropolis in Texas. The study's objective was to emphasize the opinions of teachers in order to develop an understanding of the program's effectiveness in terms of academic progress and character development. The second objective of the study was to comprehend the fundamental reasons for the perceived efficacy at that level. Baca, et al (2020)

This research aims to measure the level of integration of ICT in teaching, learning, and assessment practices during the COVID-19 pandemic. We propose measuring teachers' attitudes, self-efficacy, and skills in using technology because the quality of education during the pandemic was influenced by these factors. An online questionnaire was distributed among 189 teachers from all levels of education, from kindergarten to high school, and the sample was described using the means, distribution, and number of years of experience in education. The statistical analyses employed for the quantitative data included correlational study and mediation analysis. We found a correlation between gender, environment, barrier level, and teachers' attitudes, self-efficacy, and skills. Also, the teachers' attitudes mediate the association between ICT skills and ICT integration in the educational process. The results reveal high positive scores in terms of ICT integration in teaching practices, teachers' attitudes, self-efficacy, and ICT skills. The novelty of this research is that this is the first time a questionnaire based on attitudes, self-efficacy, ICT skills, and ICT integration in the classroom has been applied in the northern Moldavian region of Romania, and the results underline the educational implications for in-service teacher training. (Clipa et.al 2023)

The aptitude for mobile learning is a novel aspect of technology integration for classroom instructors. The most effective strategies for incorporating mobile devices into classroom environments in order to improve learning necessitate systematic research. This is a critical topic, as the effective incorporation of mobile learning can be facilitated by targeted professional development. Teachers must have the capacity to employ effective techniques and access supportive professional development that fosters enthusiasm and willingness in order to effectively integrate mobile devices into the classroom. The findings of this study verify that the Mobile Learning Readiness Survey (MLRS) scales are in accordance with established technology integration metrics that are derived from more conventional information technologies. Educators who possess a higher level of technology integration report that mobile learning offers the most substantial benefits, prioritize online or blended learning, and recognize the importance of external factors in the implementation process. The four scales of the MLRS typically exhibit the desirable characteristics of gradual increases in preparedness as teacher competence increases. Furthermore, they serve as a foundation for the initial development of a classification framework to facilitate the identification of specific categories of professional development.

Based on the study, the widespread adoption of technology in every aspect of life finally compelled instructors to include cutting-edge technologies into their classrooms in order to meet the ever-increasing expectations of students who are members of the millennial generation. Therefore, the effectiveness of

teachers in integrating technology into the classrooms becomes a very important issue, in addition to the potential and positive roles that the utilization of technology in educational settings can play. Caner (2021)

Challenges in Technology Integration

Student technology gaps, or digital divides, are serious. Socioeconomic status, location, and infrastructure limit some students' access to technology and the internet outside of school. This inequality hinders assignment completion, research, and online education. Thus, students with limited access may not fully engage in digital learning, affecting their academic performance. Addressing the digital divide is essential for equal access to technology and the vast educational resources online for all students. Educator. (2023, August 18)

According to the study's findings, teachers are of the opinion that the program had a highly positive impact on student academic achievement after the first two years of implementation, but only a somewhat positive impact on character development. Teachers provided specific suggestions for a more successful program, including the provision of improved administrative support to address ongoing challenges, the establishment of clear expectations and ownership for teaching digital citizenship to students, and an increase in ongoing professional development.

In many ways, the digital divide between urban and rural schools hinders technology integration in education and increases educational inequality. We found 36 Scopus and Web of Science articles and conference papers on rural school technology use using the latest version of PRISMA 2020. We used Critical Interpretive Synthesis to identify rural school technology integration challenges and solutions. Based on the ecological perspective, 29 challenges were categorized as macro, meso, and micro. The analysis also found solutions to these studies' problems. This review seeks to define good technology integration practices in rural schools by examining contextual challenges and solutions. Future research should examine how technology integration affects rural school students' learning and achievement.

The study states that understanding programming implementation in Swedish compulsory schools is necessary. This study examined how fourth- through sixth-graders incorporate programming into their technology curriculum. Swedish teachers choose educational materials. Visual programming languages (VPLs) are common in classrooms, according to recent studies. There is also a lack of empirical research on why instructors choose programming learning environments (PLEs) and the challenges they face. This study investigated educators' PLE choices and their influencing factors. This study also examined pedagogical content knowledge (PCK) and systemic and situational amplifiers and filters in programming education, emphasizing the importance of understanding these factors for successful implementation. Semi-structured interviews with 14 experienced 4–6 programming instructors were used to gather data. Three textual programming languages were also found, but VPLs, particularly Scratch, were widely used. Additionally, the results suggest that teachers' PLE preferences are strongly influenced by their prior education. Thus, programming education is necessary for professional development and pre-service teacher training. This study examines PLE choice factors to better understand programming education in Sweden's compulsory schools. Bjursten (2023)

As a natural consequence of the advancements that have been taking place simultaneously in society and technology, it is required of individuals living in the modern era to possess abilities in a variety of domains. These abilities are also referred to as 21st century skills, and they are particularly prevalent in industrialized nations. Some of these skills include critical thinking, creative thinking, and reflective thinking; problem solving; and digital literacy, which refers to the ability to keep up with the digital world.

Within the context of our nation's efforts to cultivate qualified individuals, universities play an important role. It is essential for those who provide education in these fields to possess the necessary skills in order to ensure that the training programs are kept up to date, that they are in step with the current era, and that they have a voice in the digital world. Ayyildiz et. al.

Taking this perspective into consideration, the purpose of this study was to investigate the degrees of digital literacy possessed by Turkish academics who are employed in educational faculties, as well as the perspectives of students regarding the technological integration capabilities of academics. For the purpose of this investigation, a quantitative cross-sectional design was chosen. During the process of selecting the participants, a method known as intentional sampling was utilized, and two distinct participant groups—namely, academics and future teachers—were included in the process.

For the purpose of this study, two scales that have been shown to be valid and reliable in previous research were utilized as instruments for data collecting. In the process of gathering information, the first step was to administer a survey to academics who were working in educational faculties. Subsequently, a second survey was carried out with individuals who were interested in becoming teachers. In order to develop descriptive and inferential statistics, the results that were acquired were subjected to quantitative data analysis using the software programs SPSS 24 and AMOS 24. A substantial difference in the digitization of academics was found to be caused by the factors of department, age, and grade level, according to the findings. On the other hand, the gender variable was shown to have a significant contribution only to the perceptions of potential teachers.

Teachers need regular professional development to use ICT in maths lessons. This paper examines TPACK and ICT barriers to mathematics instructor professional development. This study used TPACK by Mishra and Koehler. Quantitative and qualitative research was done. In a quantitative survey, 93 math teachers reported higher content, pedagogical, and content knowledge. Their technology, pedagogical, and content knowledge was lower. In semi-structured interviews, 10 participants identified six classroom ICT integration barriers. Curriculum time, technological infrastructure, ICT's impact on learning, ineffective professional development, teachers' pedagogical beliefs, and poor leadership are these obstacles. Continuous professional development on ICT integration barriers may improve teachers' TPACK and math instruction. Freitas (2019)

Support for Technology Integration

The focus of the researchers is the Technological Pedagogical and Content Knowledge (TPACK) framework, which is employed to evaluate the comprehension of instructors regarding the use of technology in the classroom. The objective of the model is to establish the knowledge and skills that educators require to effectively incorporate technology into their teachings. Through the implementation of the TPACK, teacher educators can enhance their students' readiness for contemporary challenges. Additionally, teachers should be given ample opportunities to develop technological competencies that enable them to effectively use ICT in their instruction. Akram (2022)

According to the study of Abedi, et. Al (2023). In Ghana, the incorporation of technology has become a necessity in the education system due to the growing interest of policymakers in enhancing educational outcomes, despite the fact that it has had a minimal impact on student learning. There are numerous studies that concentrate on the identification of obstacles to effective integration, but they fail to address the more profound reasons why educators employ technology. This qualitative study was designed to investigate

the fundamental beliefs that influence the decision-making and thought processes of educators in relation to the integration of technology. To interpret and categorize teacher beliefs, the study employed an 'ICT Pedagogical Beliefs Classification Framework', open-ended questions, and interviews with five education officials, twenty teachers, and five headteachers. Thematic analysis of the findings identified four primary beliefs: the development of students' ICT skills, the meeting of curriculum expectations, the engagement of students in authentic teaching, and the use of productivity tools for teaching and lesson preparation.

The rapid expansion of the Information and Communication Technologies (ICTs) has transformed learners into digital learners, requiring teachers to integrate technology into their pedagogical approaches, where teachers' attitudes, technological knowledge, and skills play a significant role in its effective integration. From this perspective, the current study presents teachers' perceptions regarding technology integration in their teaching-learning practices at all educational levels in light of the previous studies performed in the last 5 years in Pakistan. The findings reveal that teachers exhibit positive perceptions regarding technology integration in teaching-learning practices. They believe that technology-incorporated teaching assists them in enhancing their instructional practices effectively, making the learning process exciting and interactive, and keeping learners motivated. Regarding barriers, the slow speed of the internet, load shedding, lack of infrastructure, online teaching experience, and training were reported as the main obstacles that hinder teachers from effective integration of ICT into their teaching practices. Accordingly, the study findings suggest that concerned authorities should set clear and effective policies to make efficient use of ICT by allocating a sufficient budget and ensuring all necessary facilitation (e.g., ICT infrastructure, tools, software, internet, and labs) in all educational institutions. Furthermore, particular attention should be devoted to supplying adequate opportunities for the career development of teachers in developing technological competencies, which help them successfully use ICT in their instructional practices. Akram et. al (2022).

The study investigated factors that influence Aksum University's ICT integration in teaching-learning. We used descriptive survey research. The population included 550 teachers and 5 college deans. These included 385 teachers and 5 college deans, selected using stratified random and comprehensive sampling, respectively. Data was collected via questionnaires and interviews. A one-sample t-test found that teachers' ICT attitudes, accessibility, self-efficacy, competence, and technology characteristics strongly influenced ICT integration, while technical support, curriculum, administrative support, and ICT policy were less likely to influence ICT utilization. Correlation showed that ICT integration positively correlated with all independent variables. Regression analysis revealed that teachers' self-efficacy, attitude, technology characteristics, facility accessibility, competence, ICT policy, and administrative support significantly predicted 88.1 % of ICT integration ($F(7, 377) = 400.393$, $p < 0.05$). Interview results showed that inadequate administrative and technical support, restrictive curriculum, lack of time, lack of electric power, and concrete models to integrate technologies hinder ICT use in teaching-learning. Thus, personal and institutional factors affect ICT integration in teaching-learning. Seifu (2020)

Teachers in service all around are supposed to include technology into their particular subject matter. This qualitative research aimed to investigate in-service teachers' views on building-level assistance for technology integration. Study participants were invited to engage in semistructured interviews to explore how they were educated to use, transfer and integrate technology into instructional content areas for digital learners of the 21st Century. The participants in the study were invited to engage in semistructured interviews to explore how they were educated to use, transfer and integrate technology into instructional content domains for digital learners of the 21st Century. Williams, M. E. (2020).

The purpose of this paper is to explore external factors: organization technical support, organization administrative support, organization infrastructure and resources, and organization ICT policy's effect on the commitment in use of technology among the faculty staff Hail university, Saudi Arabia. Overall, the results provided evidence that organization technical support, organization administrative support, and organization infrastructure and resources have a significant positive impact on the commitment in use of technology. However, organization ICT policy has an insignificant negative impact on the commitment in use of technology. The findings could be generalized on other public sector universities of the Kingdom of Saudi Arabia. (Khan et.al. (2022)

Teachers' enthusiasm for technology is evident; however, their convictions suggest that they regard it primarily as a productivity instrument to complement their existing teaching practices, which they hold in high regard. The findings suggest that the majority of teachers hold teacher-centered ICT beliefs, which suggests the necessity of transformative professional development to encourage a shift in teachers' beliefs and the acceptance of technology as a pedagogical tool that can facilitate deep student learning and constructive pedagogy.

For the successful integration of technology into the classroom of young learners, it is crucial to acknowledge the substantial influence of instructors on the appropriate utilization of related technologies. Thus, the objective of this investigation was to evaluate the attitudes, knowledge, utilization, and obstacles that English teachers of young learners' face when attempting to incorporate technological tools into their language classes.

According to the study this research aims to provide android applications to empower mathematics teachers' information and communication technology readiness. The purpose is to facilitate them, due to availability and widely distribution of Android devices, to support them in Bring Your Own Devices (BYOD) practice in mathematics education. The method used is survey to mathematics teachers followed by design and development of the applications. The survey results show six indicators of the Information and Communication Technology (ICT) readiness: (1) understanding ICT in education; (2) curriculum and assessment; (3) pedagogy; (4) ICT; (5) organization and administration; and (6) teacher professional learning, already achieved in the surveyed area. The applications developed, Guidelinks to facilitate the use of internet-accessible resources and LDSoft to document and share teachers' learning designs, are the result of mathematics teachers' need and researchers' capabilities analysis. Both purposed for use by mathematics teachers in internet-connected environment, either at school or home, that benefit for use in COVID-19 Pandemic situation. Teachers can be empowered to optimize the use of their own devices for use in teaching and learning practices. Fathrrohman et.al. (2021).

The use of technology in the field of teacher education has seen a growing appeal, therefore giving teachers a wider range of options for creating innovative teaching ideas. Still, the practical consequences of including technology have continued to fuel heated debates about the need of supporting systems required for the smooth integration of technology into teaching approaches.

In Iran, 95 young learners who are English language instructors at language institutes and schools were surveyed. Four components of the survey were included: a questionnaire on technological instruments, a questionnaire on teachers' attitudes, a questionnaire on teachers' challenges, and eleven open-ended questions. There was a general positive trend toward the incorporation of technology into young learner classes, as indicated by the study's findings.

Additionally, the findings indicated that the majority of educators lacked the necessary technological and pedagogical expertise to effectively instruct young learners in the English language using technology.

Additionally, the results indicated that a significant number of educators were not offered training courses on the integration of technology into the curriculum of young learners; however, they expressed willingness to engage in professional development programs that were technology-based. Teachers' technological skills were highlighted by the COVID-19 pandemic's distance education passage. Science teachers' technology integration skills are assessed in this study. This assessment assessed participants' understanding of science education technologies, their ability to incorporate them into their courses, and their views on technology integration. Multiple holistic case studies were used in qualitative research. Criterion sampling selected 16 science teachers from six schools in Nigde's city centre for the survey. In 2019–2020, data was collected using a classroom observation form and a semi-structured instructor interview form. According to the research, teachers think science lessons should incorporate technology based on subject and learner characteristics. The science teachers in the study only used computers and projectors. In order to address this issue, educators suggest incorporating applied technology integration courses into science courses in undergraduate education, allowing students to choose technology integration courses from other departments, and offering practical and in-service training in small groups delivered by university experts.

The research that has been published in the academic literature highlight the fact that increasing the self-efficacy views of pre-service teachers regarding the incorporation of technology during their education process would ultimately result in successful technology integration in the field in the future. Consequently, it is felt that it is worthwhile to undertake research on the self-efficacy beliefs of pre-service teachers before they begin their careers. In relation to this principle, the purpose of the current research was to investigate the self-efficacy beliefs of pre-service teachers who were enrolled in four distinct teacher education programs at a state university in Turkey. There was a total of 439 pre-service teachers who participated in the study on a voluntary basis. There were 145 males and 291 females, with the missing value being three. These pre-service teachers were enrolled in English language teacher education (n=115), Primary school teacher education (n=115), Turkish language teacher education (n=92), and Science teacher education (n=117) programs.

A survey of the 4 point scale Likert type, which was self-administered and included some demographic questions, was used to collect the data for the current study, which utilized a quantitative research design that did not involve any experiments involving participants. An examination of the quantitative data using statistical analysis found that pre-service teachers have a high level of self-efficacy in terms of the incorporation of technology in general. In addition, it was shown that although there is a substantial difference in the self-efficacy of pre-service teachers regarding the incorporation of technology, some majors and grade level factors show a significant difference. However, there was no difference identified in terms of the gender variable.

This study suggests flipped professional development (PD) for teachers to support technology integration. Key factors include content focus, active learning, coherence, duration, collective participation, and context. The study also examines learner-centeredness, relevance, and support in recent technology integration PD studies.Yurtseven et. Al (2020)

The study of teacher preparedness and the evolving technological advancement within teacher education is crucial in recent times. This study explores the current state of teacher readiness in Colleges of Education (CoE) in Ghana. It focused on integrating technology into the teacher preparation programmes by leveraging teachers' readiness and continuous professional development. A mixed-method approach was employed, involving 485 participants (469 tutors & 16 principals) selected from sixteen colleges using

cluster, stratified and purposive sampling techniques. Quantitative data were collected through structured questionnaires, while qualitative data were sought through semi-structured interview schedules. The quantitative data were analyzed using descriptive and inferential statistics, and the qualitative data underwent inductive analysis. The findings indicated that factors like age, gender, higher qualifications, and professional experience influenced technology integration. Key tools such as smartphones and Microsoft Office 365 were insufficient for effective technology use, mainly due to infrastructural challenges and resistance to change. The study recommends resourcing teacher training institutions and regular in-service training by the Ministry of Education to equip CoE staff with the necessary skills for technology integration. Mpuangnan (2024)

Mobile devices and applications are examples of education technology that have been shown to be quite successful in raising student performance and fostering classroom involvement. Apps and mobile devices allowed teacher Shelley Emslie of Swan River School District 4 in Montana to become a Google Certified Educator and an ed tech pioneer with minimal help from their tiny IT department. Although G Suite for Education makes things easier, teachers can begin on the road to becoming authorities in educational technology. But, in order for teachers to really use technology for active learning, they need help and training. For certain rural and low-income schools, teachers are getting less training on how they may meaningfully include technology. Investing in professional development could be difficult for these districts. IT and district leaders with limited access can maximize educational technology by looking for alliances with companies with an online presence, thereby enabling teachers to improve their knowledge. Seven teachers from a small, suburban, Catholic K-8 school participated in the study, rating their concerns regarding the use of iPads in the classroom from lowest to highest. The Stages of Concern Questionnaire, Levels of Use observation rubric, and one-on-one interviews were utilized as data sources. Themes and patterns were identified through open and axial coding in the data analysis. The results suggested that teachers were not particularly concerned with the integration of iPad, as well as with the conflicts between their teaching responsibilities and their interests, and with the acquisition of additional training on classroom time and organization.

The results also showed that they had a high level of concern about the development of working relationships with fellow faculty members to maximize the benefits of iPad training, as well as about receiving additional iPad training. Lastly, the results suggested that teachers were apprehensive about the acquisition of additional iPads for pupils and the improvement of network connectivity within the school. These findings will assist administrators and designers in implementing positive changes to professional development that will enhance and increase the successful integration of mobile technology in the classrooms of instructors.

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alliances with companies with an online presence, thereby enabling teachers to improve their knowledge. Staff, E. (2020b, May 6).

This research aims to measure the level of integration of ICT in teaching, learning, and assessment practices during the COVID-19 pandemic. We propose measuring teachers' attitude, self-efficacy, and skills in using technology because the quality of education during the pandemic was influenced by these factors. An online questionnaire was distributed amongst 189 teachers from all levels of education, from kindergarten to high school, and the sample was described using the means, distribution, and number of years of experience in education. The statistical analyses employed for the quantitative data included correlational study and mediation analysis. We found a correlation between gender, environment, barrier level and teachers' attitude, self-efficacy, and skills. Also, the teachers' attitude mediates the association between ICT skills and ICT integration in the educational process. The results reveal high positive scores in terms of ICT integration in teaching practices, teachers' attitude, self-efficacy, and ICT skills. The novelty of this research is that this is the first time a questionnaire based on attitude, self-efficacy, ICT skills, and ICT integration in the classroom has been applied in the northern Moldavian region of Romania, and the results underline the educational implications for in-service teacher training. (Clipa et.al 2023)

The aptitude for mobile learning is a novel aspect of technology integration for classroom instructors. The most effective strategies for incorporating mobile devices into classroom environments in order to improve learning necessitate systematic research. This is a critical topic, as the effective incorporation of mobile learning can be facilitated by targeted professional development. Teachers must have the capacity to employ effective techniques and access supportive professional development that fosters enthusiasm and willingness in order to effectively integrate mobile devices into the classroom. The findings of this study verify that the Mobile Learning Readiness Survey (MLRS) scales are in accordance with established technology integration metrics that are derived from more conventional information technologies. Educators who possess a higher level of technology integration report that mobile learning offers the most substantial benefits, prioritize online or blended learning, and recognize the importance of external factors in the implementation process. The four scales of the MLRS typically exhibit the desirable characteristics of gradual increases in preparedness as teacher competence increases. Furthermore, they serve as a foundation for the initial development of a classification framework to facilitate the identification of specific categories of professional development.

Based on the study the widespread adoption of technology in every aspect of life finally compelled instructors to include cutting-edge technologies into their classrooms in order to meet the ever-increasing expectations of students who are members of the millennial generation. Therefore, the effectiveness of the teachers in integrating technology into the classrooms becomes a very important issue, in addition to the potential and positive roles that the utilization of technology in educational settings can play. Caner (2021)

Challenges in Technology Integration

The primary obstacles to incorporating technology into the curriculum of young learners were identified as inadequate computer resources, an insufficient level of expertise among educators, and a lack of support from educational institutions. The findings of this study serve as an incentive for additional researchers to conduct more comprehensive investigations into the integration of technological instruments into language instruction for young learners. Taghizadeh, & Yourdshahi, (2019)

According to the study's findings, teachers are of the opinion that the program had a highly positive impact on student academic achievement after the first two years of implementation, but only a somewhat positive

impact on character development. Teachers provided specific suggestions for a more successful program, including the provision of improved administrative support to address ongoing challenges, the establishment of clear expectations and ownership for teaching digital citizenship to students, and an increase in ongoing professional development.

The study states that understanding programming implementation in Swedish compulsory schools is necessary. This study examined how fourth- through sixth-graders incorporate programming into their technology curriculum. Swedish teachers choose educational materials. Visual programming languages (VPLs) are common in classrooms, according to recent studies. There is also a lack of empirical research on why instructors choose programming learning environments (PLEs) and the challenges they face. This study investigated educators' PLE choices and their influencing factors. This study also examined pedagogical content knowledge (PCK) and systemic and situational amplifiers and filters in programming education, emphasizing the importance of understanding these factors for successful implementation. Semi-structured interviews with 14 experienced 4–6 programming instructors were used to gather data. Three textual programming languages were also found, but VPLs, particularly Scratch, were widely used. Additionally, the results suggest that teachers' PLE preferences are strongly influenced by their prior education. Thus, programming education is necessary for professional development and pre-service teacher training. This study examines PLE choice factors to better understand programming education in Sweden's compulsory schools. Bjursten (2023)

As a natural consequence of the advancements that have been taking place simultaneously in society and technology, it is required of individuals living in the modern era to possess abilities in a variety of domains. These abilities are also referred to as 21st century skills, and they are particularly prevalent in industrialized nations. Some of these skills include critical thinking, creative thinking, and reflective thinking; problem solving; and digital literacy, which refers to the ability to keep up with the digital world. Within the context of our nation's efforts to cultivate qualified individuals, universities play an important role. It is essential for those who provide education in these fields to possess the necessary skills in order to ensure that the training programs are kept up to date, that they are in step with the current era, and that they have a voice in the digital world. Ayyildiz et. al.

Taking this perspective into consideration, the purpose of this study was to investigate the degrees of digital literacy possessed by Turkish academics who are employed in educational faculties, as well as the perspectives of students regarding the technological integration capabilities of academics. For the purpose of this investigation, a quantitative cross-sectional design was chosen. During the process of selecting the participants, a method known as intentional sampling was utilized, and two distinct participant groups—namely, academics and future teachers—were included in the process.

For the purpose of this study, two scales that have been shown to be valid and reliable in previous research were utilized as instruments for data collecting. In the process of gathering information, the first step was to administer a survey to academics who were working in educational faculties. Subsequently, a second survey was carried out with individuals who were interested in becoming teachers. In order to develop descriptive and inferential statistics, the results that were acquired were subjected to quantitative data analysis using the software programs SPSS 24 and AMOS 24. A substantial difference in the digitization of academics was found to be caused by the factors of department, age, and grade level, according to the findings. On the other hand, the gender variable was shown to have a significant contribution only to the perceptions of potential teachers.

Teachers need regular professional development to use ICT in maths lessons. This paper examines TPACK and ICT barriers to mathematics instructor professional development. This study used TPACK by Mishra and Koehler. Quantitative and qualitative research was done. In a quantitative survey, 93 math teachers reported higher content, pedagogical, and content knowledge. Their technology, pedagogical, and content knowledge was lower. In semi-structured interviews, 10 participants identified six classroom ICT integration barriers. Curriculum time, technological infrastructure, ICT's impact on learning, ineffective professional development, teachers' pedagogical beliefs, and poor leadership are these obstacles. Continuous professional development on ICT integration barriers may improve teachers' TPACK and math instruction. Freitas (2019)

Support for Technology Integration

The focus of the researchers is the Technological Pedagogical and Content Knowledge (TPACK) framework, which is employed to evaluate the comprehension of instructors regarding the use of technology in the classroom. The objective of the model is to establish the knowledge and skills that educators require to effectively incorporate technology into their teachings. Through the implementation of the TPACK, teacher educators can enhance their students' readiness for contemporary challenges. Additionally, teachers should be given ample opportunities to develop technological competencies that enable them to effectively use ICT in their instruction. Akram (2022)

According to the study of Abedi, et. Al (2023). In Ghana, the incorporation of technology has become a necessity in the education system due to the growing interest of policymakers in enhancing educational outcomes, despite the fact that it has had a minimal impact on student learning. There are numerous studies that concentrate on the identification of obstacles to effective integration, but they fail to address the more profound reasons why educators employ technology. This qualitative study was designed to investigate the fundamental beliefs that influence the decision-making and thought processes of educators in relation to the integration of technology. To interpret and categorize teacher beliefs, the study employed an 'ICT Pedagogical Beliefs Classification Framework', open-ended questions, and interviews with five education officials, twenty teachers, and five headteachers. Thematic analysis of the findings identified four primary beliefs: the development of students' ICT skills, the meeting of curriculum expectations, the engagement of students in authentic teaching, and the use of productivity tools for teaching and lesson preparation.

The rapid expansion of the Information and Communication Technologies (ICTs) has transformed learners into digital learners, requiring teachers to integrate technology into their pedagogical approaches, where teachers' attitudes, technological knowledge, and skills play a significant role in its effective integration. From this perspective, the current study presents teachers' perceptions regarding technology integration in their teaching-learning practices at all educational levels in light of the previous studies performed in the last 5 years in Pakistan. The findings reveal that teachers exhibit positive perceptions regarding technology integration in teaching-learning practices. They believe that technology-incorporated teaching assists them in enhancing their instructional practices effectively, making the learning process exciting and interactive, and keeping learners motivated. Regarding barriers, the slow speed of the internet, load shedding, lack of infrastructure, online teaching experience, and training were reported as the main obstacles that hinder teachers from effective integration of ICT into their teaching practices. Accordingly, the study findings suggest that concerned authorities should set clear and effective policies to make efficient use of ICT by allocating a sufficient budget and ensuring all necessary facilitation (e.g., ICT infrastructure, tools, software, internet, and labs) in all educational institutions. Furthermore, particular

attention should be devoted to supplying adequate opportunities for the career development of teachers in developing technological competencies, which help them successfully use ICT in their instructional practices. Akram et. al (2022).

The study investigated factors that influence Aksum University's ICT integration in teaching-learning. We used descriptive survey research. The population included 550 teachers and 5 college deans. These included 385 teachers and 5 college deans, selected using stratified random and comprehensive sampling, respectively. Data was collected via questionnaires and interviews. A one-sample t-test found that teachers' ICT attitudes, accessibility, self-efficacy, competence, and technology characteristics strongly influenced ICT integration, while technical support, curriculum, administrative support, and ICT policy were less likely to influence ICT utilization. Correlation showed that ICT integration positively correlated with all independent variables. Regression analysis revealed that teachers' self-efficacy, attitude, technology characteristics, facility accessibility, competence, ICT policy, and administrative support significantly predicted 88.1 % of ICT integration ($F(7, 377) = 400.393$, $p < 0.05$). Interview results showed that inadequate administrative and technical support, restrictive curriculum, lack of time, lack of electric power, and concrete models to integrate technologies hinder ICT use in teaching-learning. Thus, personal and institutional factors affect ICT integration in teaching-learning. Seifu (2020)

The purpose of this paper is to explore external factors: organization technical support, organization administrative support, organization infrastructure and resources, and organization ICT policy's effect on the commitment in use of technology among the faculty staff Hail university, Saudi Arabia. Overall, the results provided evidence that organization technical support, organization administrative support, and organization infrastructure and resources have a significant positive impact on the commitment in use of technology. However, organization ICT policy has an insignificant negative impact on the commitment in use of technology. The findings could be generalized on other public sector universities of the Kingdom of Saudi Arabia. (Khan et.al. (2022)

Technology has been reshaping society throughout time. Long before ChatGPT arrived, digital technologies began to alter the world of work and the abilities needed for success. The World Economic Forum claims, as one evidence, that new technologies will continue to be a major engine of corporate transformation until 2027. One The U.S. Bureau of Labor Statistics provides more proof in its projection of 23% job growth for computer and information research scientists from 2022-2032. Two That's compared to 0.3% annual growth for jobs overall during the same time. Integrating Technology in the Classroom: Best Practices. (2024, December 4)

Teachers' enthusiasm for technology is evident; however, their convictions suggest that they regard it primarily as a productivity instrument to complement their existing teaching practices, which they hold in high regard. The findings suggest that the majority of teachers hold teacher-centered ICT beliefs, which suggests the necessity of transformative professional development to encourage a shift in teachers' beliefs and the acceptance of technology as a pedagogical tool that can facilitate deep student learning and constructive pedagogy.

For the successful integration of technology into the classroom of young learners, it is crucial to acknowledge the substantial influence of instructors on the appropriate utilization of related technologies. Thus, the objective of this investigation was to evaluate the attitudes, knowledge, utilization, and obstacles that English teachers of young learners' face when attempting to incorporate technological tools into their language classes.

According to the study this research aims to provide android applications to empower mathematics teachers' information and communication technology readiness. The purpose is to facilitate them, due to availability and widely distribution of Android devices, to support them in Bring Your Own Devices (BYOD) practice in mathematics education. The method used is survey to mathematics teachers followed by design and development of the applications. The survey results show six indicators of the Information and Communication Technology (ICT) readiness: (1) understanding ICT in education; (2) curriculum and assessment; (3) pedagogy; (4) ICT; (5) organization and administration; and (6) teacher professional learning, already achieved in the surveyed area. The applications developed, Guidelinks to facilitate the use of internet-accessible resources and LDSoft to document and share teachers' learning designs, are the result of mathematics teachers' need and researchers' capabilities analysis. Both purposed for use by mathematics teachers in internet-connected environment, either at school or home, that benefit for use in COVID-19 Pandemic situation. Teachers can be empowered to optimize the use of their own devices for use in teaching and learning practices. Fathrrohman et.al. (2021).

Following the rise in device use during the pandemic, schools are also experiencing resistance from teachers and the community regarding screen time for students and technology use. Some teachers are rejecting technology entirely rather than looking for moderate use of digital solutions and technology tools. All of this is underpinned by a lack of time and money for tech integration solutions, including professional growth. Understandably, training for other fields, such as literacy, is given top priority over technology skills. On the other hand, training in technology and subject area is not incompatible. Professional development can help teachers improve their pedagogical skills and tool integration capacity—including those from Google and Microsoft—to assist teaching and learning when curriculum and technology leaders collaborate. Teachers who grasp the link between technology and content learn how to include tech tools into their courses, so enhancing the adoption of these resources. One professional development session allows districts to meet several needs, so helping to avoid time limits as well.

Theories that shape how teachers see the learning process have existed ever since there have been teachers attempting to instruct pupils. These learning theories include our views on the essence of knowledge and how one acquires it.

Debates about learning theories have gone on for millennia; even in the contemporary world, scientists, psychologists, and teachers have very different opinions on learning. Among the key learning theories influencing current discussions on technology integration are behaviorism, cognitivism, constructivism, constructionism, and connectivism. Every one of these theories has been researched and written about extensively; in the constrained area available in this chapter, it is impossible to give each theory enough time and focus. Instead, every teacher should research rival learning theories and create their own knowledge of how individuals learn. This chapter will just offer an exceedingly high level summary of each of these theories, therefore briefly clarifying what each one comprises and what each could imply for learning and teaching using technology.EdTech Books. (n.d.).

Technology integration research on persistence is needed. Teachers' persistence is strongly associated with their autonomous motivation, as defined by self-determination theory (SDT); however, most SDT-based studies have focused on teachers' support and students' motivation and well-being. SDT founders also recently suggested that future studies should include teacher motivation towards the use of technology.*EdTech Books*. (n.d.).

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teachers' attitudes, technological knowledge, and skills play a significant role in its effective integration. From this perspective, the current study presents teachers' perceptions regarding technology integration in their teaching-learning practices at all educational levels in light of the previous studies performed in the last 5 years in Pakistan.

In Iran, 95 young learners who are English language instructors at language institutes and schools were surveyed. Four components of the survey were included: a questionnaire on technological instruments, a questionnaire on teachers' attitudes, a questionnaire on teachers' challenges, and eleven open-ended questions. There was a general positive trend toward the incorporation of technology into young learner classes, as indicated by the study's findings.

Additionally, the findings indicated that the majority of educators lacked the necessary technological and pedagogical expertise to effectively instruct young learners in the English language using technology. Additionally, the results indicated that a significant number of educators were not offered training courses on the integration of technology into the curriculum of young learners; however, they expressed willingness to engage in professional development programs that were technology-based. Teachers' technological skills were highlighted by the COVID-19 pandemic's distance education passage. Science teachers' technology integration skills are assessed in this study. This assessment assessed participants' understanding of science education technologies, their ability to incorporate them into their courses, and their views on technology integration. Multiple holistic case studies were used in qualitative research. Criterion sampling selected 16 science teachers from six schools in Nigde's city centre for the survey. In 2019–2020, data was collected using a classroom observation form and a semi-structured instructor interview form. According to the research, teachers think science lessons should incorporate technology based on subject and learner characteristics. The science teachers in the study only used computers and projectors. In order to address this issue, educators suggest incorporating applied technology integration courses into science courses in undergraduate education, allowing students to choose technology integration courses from other departments, and offering practical and in-service training in small groups delivered by university experts.

The teaching profession is being changed by low-cost technology. It enables teachers to use interactive learning, distribute resources and enhance their knowledge in previously unattainable ways. This change is also clear in how teachers assume new duties. They're not only teachers; they're now pushing progress and innovation, enabling students to close the technological divide and guaranteeing equal educational opportunities for all. Teachers in low-resource areas, including inadequate infrastructure and digital tools, often depend on mobile phones and must acquire fundamental technological knowledge before they can include it into their practices.

The research that has been published in the academic literature highlight the fact that increasing the self-efficacy views of pre-service teachers regarding the incorporation of technology during their education process would ultimately result in successful technology integration in the field in the future. Consequently, it is felt that it is worthwhile to undertake research on the self-efficacy beliefs of pre-service teachers before they begin their careers. In relation to this principle, the purpose of the current research was to investigate the self-efficacy beliefs of pre-service teachers who were enrolled in four distinct teacher education programs at a state university in Turkey. There was a total of 439 pre-service teachers who participated in the study on a voluntary basis. There were 145 males and 291 females, with the missing value being three. These pre-service teachers were enrolled in English language teacher education (n=115),

Primary school teacher education (n=115), Turkish language teacher education (n=92), and Science teacher education (n=117) programs.

A survey of the 4 point scale Likert type, which was self-administered and included some demographic questions, was used to collect the data for the current study, which utilized a quantitative research design that did not involve any experiments involving participants. An examination of the quantitative data using statistical analysis found that pre-service teachers have a high level of self-efficacy in terms of the incorporation of technology in general. In addition, it was shown that although there is a substantial difference in the self-efficacy of pre-service teachers regarding the incorporation of technology, some majors and grade level factors show a significant difference. However, there was no difference identified in terms of the gender variable.

This study suggests flipped professional development (PD) for teachers to support technology integration. Key factors include content focus, active learning, coherence, duration, collective participation, and context. The study also examines learner-centeredness, relevance, and support in recent technology integration PD studies.Yurtseven et. al(2020)

Theoretical Framework

An all-encompassing guide that was designed to support the research study on enhancing the assistance that teachers receive in incorporating technology into their teaching practices is the theoretical framework that is depicted in the image. Technology-based pedagogical content knowledge (TPACK), the Unified Theory of Acceptance and Use of Technology (UTAUT), the Community of Practice (CoP), and the Diffusion of Innovations Theory are the four significant and well-established educational and technological theories that serve as the foundation for this framework. When it comes to understanding and improving the process of technology integration among educators, each of these theories offers a distinct point of view and a collection of principles that, when combined, produce a holistic foundation.

The pedagogical core of the framework is that of the first theory, which is known as Technological Pedagogical Content Knowledge (TPACK). Content, which refers to the subject matter that teachers are expected to teach, pedagogy, which refers to the methods and processes of teaching, and technology, which refers to the digital tools and platforms that are used to enhance learning, are all interconnected and emphasized in this way. Effective technology integration, as defined by the TPACK framework, is not simply the utilization of digital tools; rather, it is the integration of these tools in a meaningful manner with sound pedagogy and in-depth content knowledge. According to the findings of this research, TPACK sheds light on the ways in which teachers' proficiency in these overlapping areas influences their capacity to deliver technology-enhanced instruction that is both effective and efficient. In order to ensure that educators are equipped with the integrated knowledge required to navigate a classroom environment that is rich in technology, this framework emphasizes the necessity of professional development that targeted these intersections.

A psychological and behavioral perspective is brought to the investigation by the second theoretical foundation, which is known as the Unified Theory of Acceptance and Use of Technology (UTAUT). As part of its mission, UTAUT investigates the factors that influence individuals' decisions regarding whether or not to accept and utilize technology. To be more specific, it identifies key determinants such as performance expectancy, which is the belief that utilizing technology will improve job performance; effort expectancy, which is the perceived ease of use; social influence, which is the degree to which the opinions of others affect one's utilization of technology; and facilitating conditions, which are the availability of

resources and services. Understanding the personal and contextual barriers that may prevent teachers from adopting new technologies is essential, and this theory is essential to that understanding. The purpose of the study is to determine which supports or interventions may increase teachers' engagement and confidence in their ability to use technological tools effectively. Additionally, the UTAUT is used to evaluate the readiness and willingness of teachers to embrace technological tools.

The Community of Practice (CoP) is the third component, and it offers a social and collaborative point of view. Learning is a social process, and the most effective way for it to take place is when people who have similar interests or goals interact with one another on a regular basis, according to the theory of communities of practice (CoP). Because of this, teachers are able to benefit from being a part of a supportive professional community that allows them to share their experiences, exchange ideas, and work together to find solutions to problems that are typically encountered in the field of technology integration. A community of practice (CoP) is an organization that promotes ongoing professional development by means of collective learning, mentoring, and reflective practice. Embedding the concept of community of practice (CoP) into the framework allows the study to acknowledge the significance of establishing and maintaining collaborative spaces, both in the physical and virtual realms, where educators can develop their professional relationships with one another and gain confidence in their ability to utilize technology in the classroom.

The last component of the framework is the Diffusion of Innovations Theory, which offers a more comprehensive and holistic perspective. This theory explains how new ideas and technologies spread through cultures or organizations, as well as why they do so and at what specific rate. This helps to explain the different levels of adoption that can be found among educators in the educational setting. Some teachers may be innovators or early adopters, while others may be more resistant to change or late to adopt new practices. Once stakeholders have a better understanding of this diffusion process, they are better able to tailor support systems and interventions to the readiness levels of teachers. In addition to this, it assists in the development of strategies that can speed up the adoption process, which in turn ensures that innovations in educational technology are implemented in a greater number of classrooms eventually.

The arrows in the diagram indicate the direction of influence that each of these theories has on the overall objective, which is "Improving Support for Teachers in Technology Integration." This is an important visual function that was performed by the diagram. Each theoretical model makes a direct contribution to the formation of the strategies, tools, and professional development plans that are designed to assist educators in effectively integrating technology into their classrooms. It is essential to have a synthesis of pedagogical, behavioral, social, and systemic perspectives in order to fully address the challenges that teachers face when integrating technology. The convergence of arrows into the central box is a reflection of the interdisciplinary and integrative nature of the study, which demonstrates that no single theory is sufficient with respect to itself.

For the purpose of gaining a better understanding of and improving the quality of teacher support within the context of educational technology, this theoretical framework represents a multidimensional approach. The study is positioned to offer a rich and well-rounded analysis by drawing from TPACK, UTAUT, and the Theory of the Diffusion of Innovations. This will lead to the development of support mechanisms that are informed, practical, and sustainable for educators who are participating in the digital transformation of education.

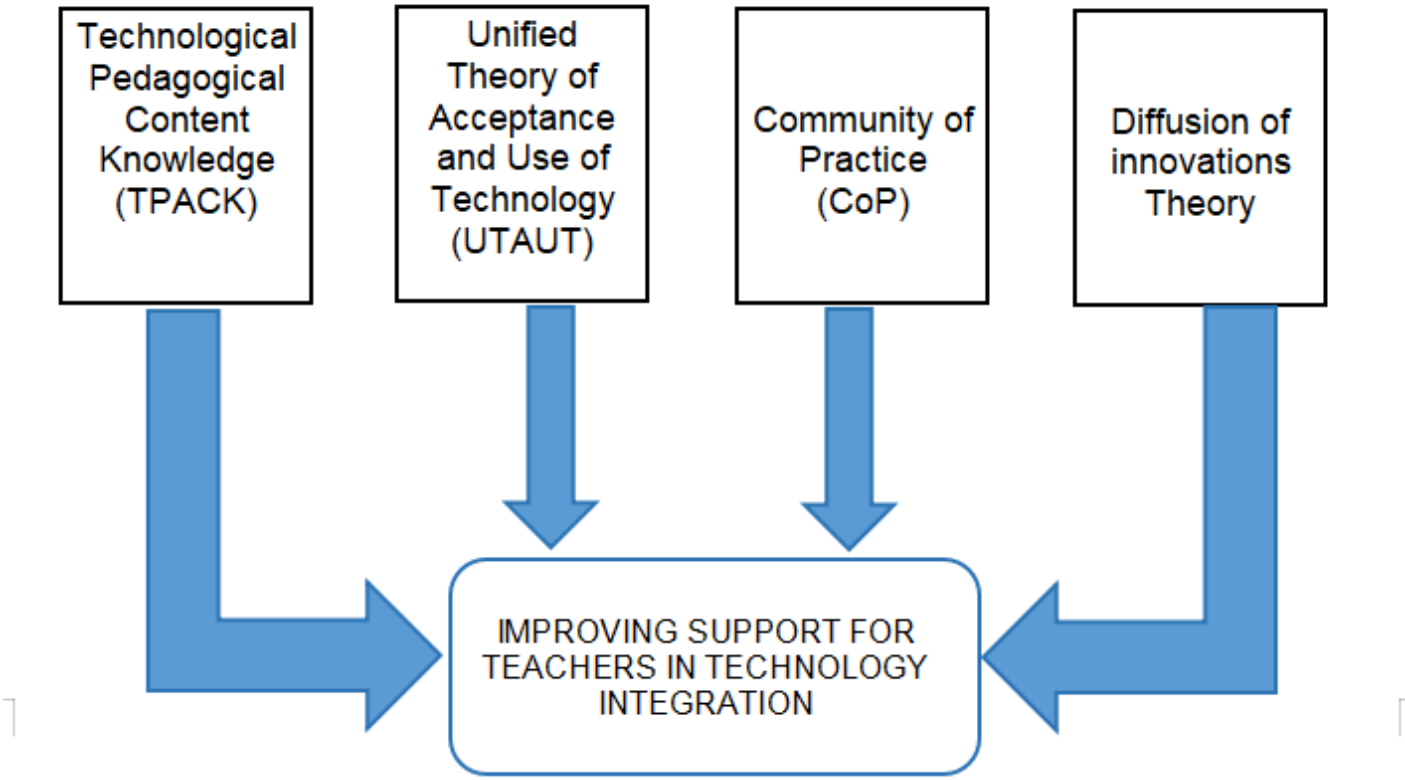

Figure 1 Theoretical Paradigm

Conceptual Framework

A conceptual framework that illustrates the dynamic relationships between the context, input, process, and product of the research is designed as an interconnected system. This framework is intended to be used for the study that aims to foster a sustainable culture of technology integration among intermediate teachers in the Daraga South District. In the overarching context, the purpose of the study is established, which is to encourage the continuous and efficient incorporation of technology into the instructional practices of the intermediate teachers in the district. The framing of research questions and the interpretation of the results are both immensely dependent on this context. According to the findings of the study, however, there are a number of input factors that could potentially influence the successful achievement of this goal. These inputs, which represent potential challenges or limitations, include a lack of adequate technological equipment (such as computers, projectors, and reliable internet access), insufficient training and professional development opportunities for teachers in the effective use of technology, and the Daraga South District's limited support systems and infrastructure. There is a significant relationship between the ability and willingness of teachers to incorporate technology into their lessons and the factors listed above.

The research makes use of a methodical approach to data collection and analysis in order to successfully navigate this context and resolve these input challenges. The survey questionnaire, which is most likely the one that is provided, is the primary instrument for data collection. Its purpose is to elicit information from intermediate teachers regarding their technological competencies, perceptions of support, and challenges they face. This questionnaire delves into specific areas such as the teachers' knowledge of basic application software (such as Word Processing Software, Presentation Software, and Spreadsheets), their

utilization of online tools and platforms (such as Email Platforms, Video Conferencing Tools, and Learning Management Systems), and the information that is available to them in terms of technical support. The collected data is then analyzed using weighted means and a 4-point scale, which are statistical techniques that are used to quantify the responses of teachers and identify key trends and patterns.

Targeted training programs are the result of this laborious process, which has been carried out. These programmes are intended to provide teachers with the knowledge and abilities they require in order to successfully incorporate technology into their teaching practices. They are designed to directly respond to the needs and challenges that have been identified. For a better understanding of the dynamic nature of the framework, the arrows that connect these components are quite important. The analysis is shaped by the specific goals of the district as well as the challenges that teachers face. The arrows that point from CONTEXT and INPUT to PROCESS showcase the research's focus on problem-solving and its sensitivity to the context. In order to emphasize the evidence-based nature of the intervention, the arrow that goes from PROCESS to PRODUCT is used. Training programs are a direct result of data analysis. In conclusion, the feedback loop, which is symbolized by the arrow that extends from the PRODUCT to the INPUT and has an effect on the CONTEXT, highlights the framework's dedication to sustainability. The effectiveness of the training programs is evaluated, and the findings are used to refine both the programs and the support systems. This helps to foster a continuous cycle of improvement, which ultimately leads to the desired sustainable culture of technology integration.

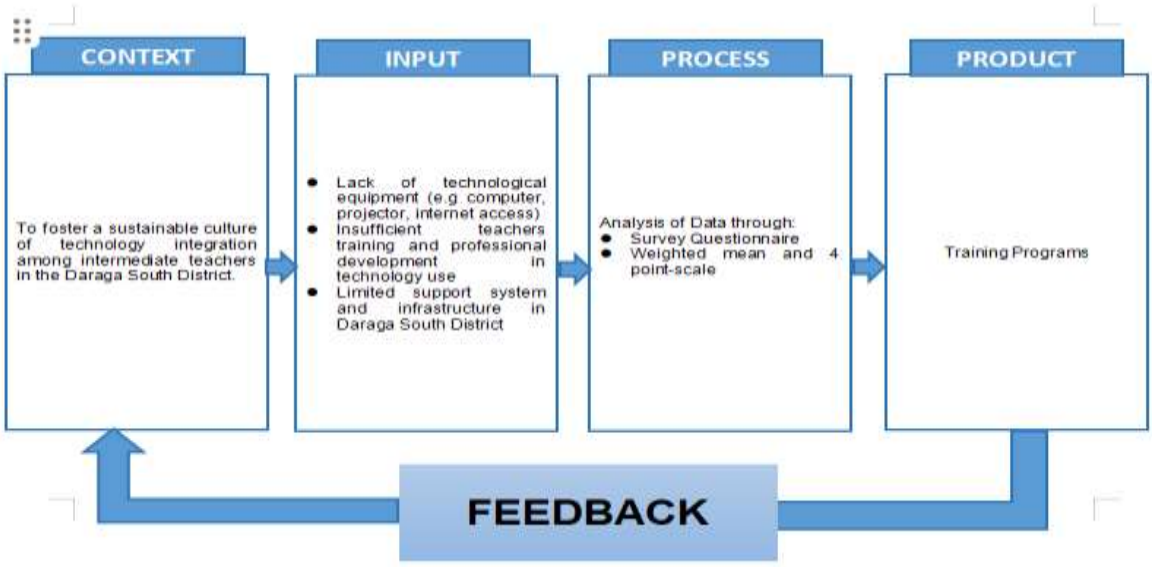

Figure 2 Conceptual Paradigm

Scope and Delimitation of the Study

This study is centered on exploring the competencies of intermediate teachers—specifically those handling Grades 4 to 6—in integrating technology into their classroom instruction. The research is conducted within the Daraga South District, encompassing a total of twenty-five (25) elementary schools. To ensure the protection of personal and institutional identities in adherence to the Data Privacy Act, the participating schools are collectively referred to as Schools A to Y throughout the study. A total of one hundred four (104) intermediate teachers have been identified as respondents, providing a representative sample from the selected schools. This focus allows for a concentrated examination of technology integration practices at the intermediate level of basic education. The primary aim of this study is to assess the current level of competency among these educators in using technological tools and digital platforms

for pedagogical purposes. In doing so, the study also seeks to identify the common challenges they face in applying these technologies in their teaching methods. Furthermore, it evaluates the support systems that are currently in place—such as training programs, availability of resources, administrative backing, and peer collaboration—that either enable or hinder the effective use of technology in the classroom. Based on these findings, the study intends to propose targeted and practical interventions designed to cultivate and strengthen a culture of technology integration in teaching practices across the district. The scope of the study is intentionally limited to pedagogical technology use. This includes, but is not limited to, the use of computers, tablets, learning management systems, educational apps, multimedia content, and internet-based instructional tools for teaching and learning purposes. The study does not include or investigate the use of technology for non-instructional functions such as administrative data processing, school management systems, or student-led technological initiatives like coding clubs or robotics teams. Additionally, the research does not delve into the broader impact of technology on student learning outcomes, focusing instead on teacher competencies and practices.

The delimitations of this study were defined by several boundaries.First, the research is geographically limited to the Daraga South District and does not extend to schools in other districts or municipalities. Second, it is confined to intermediate-level teachers, thereby excluding those teaching at the primary level (Grades 1 to 3) as well as educators at the junior or senior high school levels. Third, non-teaching personnel, including school administrators, IT staff, and support workers, are outside the scope of this study, even though they may play roles in the broader technological environment of the schools. Lastly, the study is conducted within a specific time frame and therefore does not account for long-term changes or developments in technology integration practices that may occur after the conclusion of the research. By establishing these boundaries, the study ensures a focused and manageable investigation that can yield in-depth, relevant, and actionable insights into the state of technology integration among intermediate teachers within the defined educational context.

Significance of the Study

This study is significant as it aims to enhance the integration of technology in teaching practices among intermediate teachers in the Daraga South District, thereby improving educational outcomes. By assessing teachers' competencies and identifying challenges in technology integration, the research provides valuable insights for developing targeted professional development programs. Such initiatives are crucial, as effective technology integration has been shown to foster interactive learning environments, promote student engagement, and develop essential 21st-century skills.

Furthermore, understanding the specific needs of teachers in this district allows for the formulation of tailored interventions, ensuring that resources are effectively utilized to support both educators and students. Ultimately, the study contributes to the broader goal of preparing students to thrive in a technologically advanced society by equipping teachers with the necessary skills and support systems.

Teachers. The study will assist educators in comprehending the challenges encountered in technology integration and offer a forum for articulating their requirements. It may also direct them toward effective strategies for surmounting these challenges despite resource constraints.

School Administrators. Administrators will obtain a more lucid understanding of the critical challenges faced by their educators. The study's findings can inform the development and execution of programs that offer sufficient training, resources, and support to improve teaching effectiveness.

Department of Education (DepEd). The findings from this research can assist DepEd in developing policies and initiatives to bridge gaps in technology integration, especially in the remote areas in Daraga South . It can aid national initiatives to attain a more equitable and efficient integration of technology in primary education.

Students. This study can enhance the quality of instruction and student learning experiences by tackling the challenges of technology integration. Improved pedagogical techniques can promote greater engagement, comprehension, and academic achievement.

Parents. The study emphasizes the role of technology in enhancing students' learning experiences, helping parents understand its importance and motivating them to support technology integration at home.

Policymakers. This study offers evidence-based insights into the technological challenges encountered by teachers in Grades 4 to 6 within the Daraga South schools, which will be advantageous for policymakers.

Local Government Units (LGU). The study provides valuable data for LGUs to craft local policies and allocate resources to improve IT infrastructure and provide technology-related support for schools in the district.

Non-Governmental Organizations (NGOs). The study can help NGOs identify specific areas where they can intervene, such as providing professional development training, IT resources, or funding infrastructure projects.

Researchers. This research will serve as a valuable resource for future studies focusing on educational technology, rural education, or teacher training. It may also inspire further investigations into related topics, paving the way for continuous improvement in the education sector.

Definition of Terms

Culture of Information Technology. The cultures of MNEs affect their IT use. Modern technology has changed how MNEs operate domestically and internationally. E-business, information security, and electronic financial reporting are major technological changes for accountants. Accountants must consider how culture affects technology implementation and use as they address these issues. Johns, S. K., et. Al (2023).This study defines culture of information technology as intermediate teachers' collective practices, beliefs, attitudes, and behaviour regarding digital tools and technological resources in teaching and learning. Technology is used in lesson planning, instruction, assessment, and school communication. This culture reflects teachers' IT skills, the institution's support, colleague collaboration, and Daraga South District teaching's normalisation of technology.

Information Technology (IT). IT uses computers to manage, process, protect, and exchange data. Many subfields and specialisations make up this vast field of expertise. They both want to solve problems and manage information using technology. Schulze, J. (2025, January 15). This study defines Information Technology (IT) as computers, mobile devices, internet-based applications, educational software, and multimedia resources that support and enhance teaching and learning. Intermediate teachers use word processors, presentation and spreadsheet tools, learning management systems, video conferencing platforms, email, search engines, and other instructional technologies to plan, deliver, and assess student performance.

Technology Integration. Technology makes information instantly accessible, making it essential in the classroom. Students and teachers already use smart phones, computers, and tablets daily. Technological devices in the classroom are naturally explored to enhance learning for all ages.*School of Education*. (n.d.) This study defines technology integration as intermediate teachers' intentional use of digital tools,

resources, and applications in teaching and learning. Technology is used as a supplement, essential part of lesson planning, delivery, student engagement, assessment, and classroom management. How naturally and consistently teachers integrate technology into their paedagogy to improve learning outcomes and make instruction more interactive, efficient, and relevant to 21st-century learners is measured.

Teaching-Learning Process. Teachers and students share knowledge in the teaching-learning process. An educator evaluates learning needs, sets learning objectives, and develops new learning and teaching strategies. This process improves teachers' knowledge transfer. This can happen two ways. The 'one way' method, where only the teacher speaks, and the 'circular' method, where both the teacher and students discuss and develop the class, are the two methods. eduTinker. (2024, January 18). The interactive exchange of knowledge, skills, and attitudes between teachers and students, utilizing various strategies, methods, and tools, including IT, to achieve learning objectives.

Intermediate Teachers. In education, grades are usually elementary or secondary. Preschool through fifth-grade classrooms are typical in elementary buildings. High schools typically house ninth-through-twelfth graders. Many districts separate sixth, seventh, and eighth graders into middle or junior high schools. In some districts, intermediate buildings have fifth and ninth grade classrooms. *What is an Intermediate Teacher?* (n.d.). This study defines the teaching-learning process as the dynamic and interactive cycle between teacher and student where knowledge, skills, and values are delivered, received, and developed. Lesson planning, student engagement, classroom activities, assessment, and feedback are included.

Daraga South District. Daraga has 129.01 km of roads. These include national, provincial, municipal, and barangay roads. Barangay roads dominate the municipality's road network. About 24.97% are concrete-paved, while 75.03% are asphalt, gravel, or earth fill. There are 25 bridges in the municipality, 66.22% of which are barangay roads and the rest are national, provincial, or barangay roads.Wikipedia contributors. (2025, March 12). A district under the jurisdiction of the Department of Education (DepEd) that encompasses schools located in Daraga, Albay, Philippines, where this study was conducted. Daraga South District is a Department of Education administrative division in Daraga, Albay, Philippines, in this study. The research focused on intermediate teachers in 25 public elementary schools teaching Grades 4–6. Survey respondents were from the district, which is the study's geographical and institutional scope.

Professional Development. Professional development is learning new skills through continuing education and career training after employment. A certificate, classes, workshops, or professional or industry conferences can help you learn more about your field.Lparsons. (2025, February 24). Professional development in this study refers to intermediate teachers' ongoing training, education, and capacity-building to improve their knowledge, skills, and competencies, particularly in technology integration. Workshops, seminars, peer mentoring, in-service training, and other formal or informal learning opportunities aim to improve teaching practices and keep educators up to date on teaching-learning technology.

Digital Tools. Digital tools (DT) are programmes, websites, applications, and other internet and computerized resources that aid, enhance, and run digital processes and digitization efforts. Digital tools are online resources that help organizations navigate the changing digital landscape by using modern technology and digital means.WalkMe™. (2025, March 5). This study defines digital tools as electronic or web-based applications, software, and platforms used by teachers to improve teaching and learning. Examples include word processors, presentation software, spreadsheets, learning management systems (e.g., Google Classroom), video conferencing tools (e.g., Zoom, Google Meet), search engines,

multimedia resources, and graphic design applications. To improve classroom interaction and efficiency, digital tools are used in lesson planning, instruction, student engagement, and assessment.

Instructional Materials. Teachers view instructional media as aids, not replacements. Teachers spend too much time on routine tasks like collecting and assigning books and materials and marking or grading. If aids could be designed to free them to focus on promoting understanding, intellectual curiosity, and creative activity in students, they could save time.Peel, & A, E. (2025, March 21). This study defines instructional materials as any printed, digital, or multimedia resources, content, or tools used by intermediate teachers to improve teaching-learning. Textbooks, visual aids, worksheets, videos, educational software, and digital presentations support lesson objectives and content delivery. Instructional materials include interactive modules, online resources, and classroom apps when technology is integrated.

Challenges to IT Integration. technology has become a major tool through which education can be accessed within and beyond the classroom learning context. With the wide variety of educational technologies and students' interest in using them, instructional technologies are becoming a necessary component of teachers' practices. Djoub, Z., & Djoub, Z. (2024, October 21).Barriers faced by teachers in adopting IT tools in their teaching practices, such as lack of equipment, insufficient training, or resistance to change.

DepEd's IT Policies. Guidelines and initiatives implemented by the Department of Education to promote the use of information technology (IT) in schools.

Opportunities in Technology Integration. Benefits and advantages, such as improved student engagement, access to diverse learning materials, and enhanced teaching methods, that arise from the successful implementation of information technology integration in the classroom.

Collaboration. Shared work spaces are among the most visible entries in the collaboration space. Aimed at rolling document and application sharing up with chat and perhaps versioning and other auditing capabilities, they may have more or fewer features and may be available either for license or on a syndicated basis "in the cloud," as they say. Google Docs is a notable example of the latter, Microsoft SharePoint and EMC Documented e Room of the former.Aiim. (n.d.). The practice of teachers working together to share resources, strategies, and best practices for integrating technology into their teaching methods.

Pedagogical Practices. Traditional pedagogy emphasizes face-to-face instruction and learning theories. Traditional pedagogy has expanded to include online learning in recent decades. Most face-to-face classroom pedagogical practices can be applied to online, hybrid, or blended learning environments and vice versa .Montclair State University. (n.d.). Methods, strategies, and techniques employed by teachers to deliver lessons and foster meaningful learning experiences, particularly when incorporating technology into instruction.

21st-Century Skills. Educators, business leaders, academics, and government agencies define 21st-century skills as the skills, abilities, and learning dispositions needed to succeed in 21st-century society and workplace. Wikipedia contributors. (2024, August 1). Refers to the abilities and competencies needed to thrive in today's world, including digital literacy, collaboration, critical thinking, creativity, and effective communication.

METHODOLOGY

The section outlines the systematic approach employed to assess the integration of technology in teaching practices among intermediate teachers in the Daraga South District. This study adopts a quantitative design.

Research Design

This study uses quantitative research. It was "developed and employed mathematical models, theories, or hypotheses pertaining to phenomena." says Creswell (2014). Quantitative research analyses numerical data to find patterns, relationships, and trends. Large sample sizes and statistical analysis are typical of this research. The goal is to quantify variables, generalize, and predict future outcomes from analysis. This study employed a quantitative research approach, which provides relevant and accurate information through the collection and analysis of numerical data. A survey-type questionnaire was utilized as the primary data collection tool to gather responses from intermediate teachers in the Daraga South District, consisting of 26 schools. The researcher conducted a validation process for the survey instrument with the assistance of colleagues from School Z, where the researcher is also affiliated. To ensure content validity, the survey questionnaire was validated by the school's ICT Coordinator, a highly experienced professional with extensive expertise in technology integration within educational settings. The validators provided valuable feedback to refine and improve the reliability and validity of the questionnaire. As a result of their involvement in the validation process, School Z was excluded from the respondents to maintain objectivity and avoid potential bias in the data collection process. This approach ensures that the responses collected from the remaining schools accurately represent the broader teaching community in the district. The study suggested intervention programs for intermediate teachers based on its findings. These interventions improve teachers' technology integration skills and create a supportive environment for technology adoption in teaching-learning. After the intervention plan is approved, the programs will be implemented one month later to prepare for the event. Successful execution requires planning, resource allocation, and participant coordination. This design ensures systematic data collection, analysis, and application, yielding actionable results that support the study's goals

Scale	Range	Adjectival Interpretation		
4	3.25-4.00	A- Always	VGC- Very Great Challenge	SA- Strongly Agree
3	2.50-3.24	S-Sometimes	GC- Great Challenge	A- Agree
2	1.75-2.49	R-Rarely	MC- Moderately Chanllenged	D-Disagree
1	1.00-1.74	N-Never	NC- Not Challenged	SD- Strongly Disagree

Research Instrument

This study uses a survey questionnaire to collect information about intermediate teachers' abilities to integrate technology, the difficulties they face, and the support systems available to them. There were three components to the structure. The first section assessed teachers' IT skills in word processing, presentation, spreadsheet, email, and graphic software. The frequency of use was rated on a 4-point Likert scale, with 4 meaning "Always" and 1 meaning "Never." This section also looked at how technology improved student engagement in motivation, lessons, and assessments. The second section identified challenges related to technology integration, such as the availability of resources, the reliability of the internet, time management, technical support, and professional development. These challenges were

evaluated on a scale of 1 to 4, with 4 representing a "Very Great Challenge" and 1 representing "Not Challenged." The third section used a 4-point Likert scale, which ranged from 4 (Strongly Agree) to 1 (Strongly Disagree), to evaluate support mechanisms such as IT tools, training programs, school policies, and peer mentoring. The questionnaire included clear instructions for providing accurate responses, as well as options for adding tools, challenges, or support. A small group of teachers were used to review and pretest the instrument to make sure it was valid and reliable. The data collection process adhered to ethical guidelines, which included voluntary participation, confidentiality, and the use of research data.

Data Gathering

The data gathering process began with the preparation and validation of the survey questionnaire, which served as the primary research instrument. The questionnaire was reviewed and validated by the school head and the research adviser to ensure its relevance, clarity, and alignment with the study's objectives. After validation, the instrument was pretested with a small group of intermediate teachers within the Daraga South District to identify any ambiguities or areas for improvement. Based on the feedback received, necessary adjustments were made to refine the questionnaire. Once finalized, the questionnaire was distributed to the target respondents through both physical and online formats to ensure accessibility and encourage participation. Respondents were informed about the purpose of the study, assured of the confidentiality of their responses, and reminded that their participation was voluntary. Ample time was given for respondents to complete the survey, allowing them to provide thoughtful and accurate answers. Upon collection, the responses were carefully organized, reviewed for completeness, and encoded for analysis. Ethical considerations were strictly upheld throughout the process, including obtaining informed consent and protecting the anonymity of all participants.

Data Analysis

The researcher used statistically tools that were suited for the study to analyze the collected data. The respondents were classified and tabulated systematically according to the different set-ups included in the study. All the data gathered were presented quantitatively.The numerical findings of the study were statistically analyzed and interpreted. The researcher used the weighted mean, and 4 point scale. The **weighted mean** formula is used to calculate the average of values that have different levels of importance, or weights. The formula for the weighted mean is:

$$\text{Weighted Mean} = \frac{\sum(X_i \times W_i)}{\sum W_i}$$

Where:

- X_i = Value of the i-th data point.
- W_i = Weight assigned to the i-th data point.
- $\sum(X_i \times W_i)$ = Sum of the products of each value and its corresponding weight.
- $\sum W_i$ = Sum of the weights.

Respondents of the study

The respondents to this study were intermediate teachers (Grades 4 to 6) from various elementary schools in the Daraga South District. Twenty-five (25) schools took part in the research. To uphold confidentiality and adhere to the principles of the Data Privacy Act of 2012 (Republic Act No. 10173), the names of the participating schools are not disclosed and are instead referred to collectively as Schools A to Y. The study's respondents included one hundred and four (104) intermediate teachers. The selection was based on official records provided by the Daraga South District Office. The study specifically targeted teachers in grades 4, 5, and 6, which represent the intermediate level of basic education. The researcher personally delivered the survey questionnaires to the identified respondents in each school. This approach ensured that the instrument was administered clearly, encouraged participation, and allowed for a high response rate. The focus remained on gathering reliable data about respondents' technology integration competencies, challenges, and support systems.

Table A Respondents of the study

Name of School	No. Of Intermediate Teachers
School A	3
School B	3
School C	3
School D	3
School E	2
School F	3
School G	3
School H	3
School I	2
School J	2
School K	3
School L	2
School M	4
School N	1
School O	4
School P	1
School Q	3
School R	6
School S	6
School T	7
School U	5
School V	6
School W	12
School X	8
School Y	9

TOTAL	**104**

Sampling Technique

Sampling technique or method refers to the way that the observations are selected from the population to be in the sample for a survey. It is mandatory for the researcher to clearly define the target population. In determining the sample size for the study, I employed a non-probability sampling technique. To ensure that I had an accurate list of potential respondents, I sent a letter to the district office requesting a list of the intermediate teachers in the Daraga South District. This allowed me to identify and select the 104 teachers from 25 schools across the Daraga South District who would participate in the research. This approach ensured that the sample was representative of the target population for the study, focusing on teachers in the region who would provide valuable insights into the challenges of technology integration. In the research on the competencies, challenges, and support for technology integration among intermediate teachers in Daraga South District, the researcher will use a 4-point scale with a weighted mean to analyze the data. The 4-point scale will have the following response options: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). After collecting responses from the 104 intermediate teachers across 25 schools, the researcher will calculate the weighted mean for each question. This is done by multiplying the frequency of each response by its corresponding weight, summing the results, and dividing by the total number of respondents.

Study Site

The researcher conducted the study in Daraga South District in Albay, Philippines, which includes twenty five (25) schools. The study specifically focuses on the One hundred four (104) intermediate teachers who teach learners in Grades 4 to 6. These teachers were the primary respondents for the survey, which examines their competencies in using technology, the challenges they face in technology integration, and the support they receive to enhance their technological skills.

Within the Daraga South District, the researcher study will likely involve both urban and rural schools, considering the geographical variation in access to technology and resources. This diversity in the study site will allow the researcher to analyze how factors like school location, infrastructure, and resource availability impact the integration of technology in the teaching-learning process. Given the focus of the researcher study on technology integration, the research will be particularly relevant to understanding how the specific characteristics of the Daraga South District schools—such as available equipment, training opportunities, and institutional support—affect teachers' ability to incorporate technology into their classrooms effectively.

Data Analysis Plan

Across the 25 elementary schools in the Daraga South District, four methodical stages comprised the data collecting process of this study. The first phase was the distribution of survey questionnaires—the research tool—to designated intermediate teachers managing Grades 4 to 6. To guarantee clear of instructions, foster collaboration, and create legitimacy and trust among the participants, the researcher personally delivered the questionnaires to every school. This personal method also let the researcher clarify the goal of the study and address any urgent inquiries from the respondents. The second phase concentrated on recovering and tracking the completed surveys. Ensuring the surveys were finished and returned within a fair time frame, the researcher followed up to every school. High response rates and low missing or

incomplete data were made possible by this phase.The third phase was data tabulating and organizing once the questionnaires were gathered. Every answer was meticulously encoded and organized following the layout of the questionnaire. To maintain the dependability of the data, the researcher ensured the encoding process was correct. The last step of the data collecting process was built on this phase. The analysis of findings was the fourth and last phase. Guided by the study objectives and using statistical tools, the researcher investigated the data to find trends, patterns, and areas of concern about the competencies, challenges, and support systems connected to technology integration among intermediate teachers. The insights obtained from this study formed the
foundation for developing a suggested intervention programme fit for the particular needs and situation of the Daraga South District teachers. Every stage of the process was carried out with meticulous attention to detail and ethical concerns to guarantee the validity and relevance of the results of the research.

RESULTS AND DISCUSSION

The results and discussion of the study on the competencies, challenges, and support associated with the integration of technology among intermediate teachers in the Daraga South District are presented in this section. The objective of the investigation was to evaluate the extent of technology utilization in the teaching-learning process, evaluate the obstacles encountered by educators, and evaluate the assistance they receive in their endeavors to integrate technology into their classrooms.

Table 2.a

Teacher Competencies in the use of Information Technology in teaching learning process (Small Schools)

INDICATORS	4		3		2		1			
	f	WM	f	WM	f	WM	f	WM	TWM	AI
Basic application software in IT like:										
A. Word Processing Software										
B. Presentation Software										
C. Spreadsheets	**36**	**3.2**	**9**	**0.6**	**0**	**0**	**0**	**0**	**3.8**	**A**
D. Web Browsers										
	36	**3.2**	**9**	**0.6**	**0**	**0**	**0**	**0**	**3.8**	**A**
	24	**2.13**	**19**	**1.27**	**2**	**0.09**	**0**	**0**	**3.49**	**A**
	31	**2.76**	**12**	**0.8**	**2**	**0.09**	**0**	**0**	**3.65**	**A**
Average									**3.69**	**A**
Online Tools and Platforms such as:										
A. Email Platforms										
B. Video Conferencing Tools	**10**	**0.89**	**27**	**1.8**	**7**	**0.31**	**1**	**0.02**	**3.02**	**S**
C. Learning Management Systems										
D. Search Engines	**1**	**0.9**	**16**	**1.07**	**22**	**0.98**	**6**	**0.13**	**2.27**	**R**
	0	**0**	**19**	**1.27**	**18**	**0.8**	**8**	**0.18**	**2.25**	**R**
	25	**2.22**	**13**	**0.87**	**5**	**0.22**	**2**	**0.04**	**3.35**	**A**
Average									**2.72**	**S**
Other tools in IT such as:										

A. Basic Graphic Software										
B. Multimedia Players	**14**	**1.24**	**18**	**1.2**	**13**	**0.58**	**0**	**0**	**3.02**	**S**
C. Antivirus and Security Software										
	29	**2.58**	**11**	**0.73**	**5**	**0.22**	**0**	**0**	**3.53**	**A**
	18	**1.6**	**14**	**0.93**	**12**	**0.53**	**1**	**0.02**	**3.08**	**S**
Average									**3.21**	**S**
Use technology to enhance student engagement in the following parts of the lesson:										
A. Motivation										
B. Lesson Proper										
C. Assessment	**38**	**3.38**	**7**	**0.47**	**0**	**0**	**0**	**0**	**3.85**	**A**
	38	**3.38**	**7**	**0.47**	**0**	**0**	**0**	**0**	**3.85**	**A**
	23	**2.04**	**14**	**0.93**	**0.08**	**0.36**	**0**	**0**	**3.33**	**A**
Average									**3.68**	**A**
Resolve basic technical issues										
A. Can troubleshoot basic projector/ display connection issues	**16**	**1.42**	**29**	**1.93**	**0**	**0**	**0**	**0**	**3.35**	**A**
B. Can troubleshoot basic internet issues										
C. Knows how to toggle airplane mode or reset network settings	**5**	**0.44**	**24**	**1.6**	**16**	**0.71**	**0**	**0**	**2.75**	**S**
D. Can update applications and operating systems										
E. Can troubleshoot audio/visual issues	**12**	**1.07**	**25**	**1.67**	**8**	**0.36**	**0**	**0**	**3.1**	**S**
	16	**1.42**	**29**	**1.93**	**0**	**0**	**0**	**0**	**3.35**	**A**
	12	**1.07**	**25**	**1.67**	**8**	**0.36**	**0**	**0**	**3.1**	**S**
Average									**3.13**	**S**

3.25-4.00 Always 2,50-3.24 Sometimes 1.75-2.49 Rarely 1.00-1.74 Never

The analysis of Table 2.a through the IPAIL framework—which stands for Input, Process, Assessment, Impact, and Lessons Learned—reveals a mix of strengths and areas for improvement in the competency levels of small school teachers in the use of Information Technology (IT) in the teaching-learning process. The data shows the presence and use among teachers of several IT tools, including basic application

software (such word processing tools, presentation software, spreadsheets, and web browsers), online educational platforms (including email, video conferencing, learning management systems, and search engines), as well as other IT tools (like graphic software, multimedia players, and security software). Moreover included in the competencies evaluated are the use of technology to improve various components of the lesson—especially during the motivation, lesson proper, and assessment phases—and the capacity of teachers to address fundamental technical problems including troubleshooting projectors, internet connectivity issues, software updates, and audio/visual anomalies. Teachers were evaluated under Process on a 4-point Likert scale: 4 for "Always," 3 for "Sometimes," 2 for "Rarely," and 1 for "Never." Frequencies (f), weighted means (WM), and total weighted means (TWM) for each competency area were used to quantify the results. Adjectival ratings were used to further interpret these to classify teacher performance levels.

The Assessment results show a TWM of 3.69, read as "Always," indicating that teachers are most confident and competent in using fundamental application software. This implies that most teachers often use web browsers, PowerPoint, Excel, MS Word, and other tools in their teaching delivery, indicating a good basis in digital literacy. A TWM of 3.68 and an adjectival interpretation of "Always" indicated a high degree of competence in their use of technology to improve student involvement across various lesson phases—Motivation, Lesson Proper, and Assessment. These results imply that educators are successful in including technology into their teaching to increase student interest, involvement, and performance.

The statistics, meanwhile, **draws attention to areas for development**. The TWM for online tools and platforms was much lower at 2.72, which qualifies as "Sometimes." This suggests that although some educators are aware of search engines and email systems, many still find using learning management systems and video conferencing tools—resources growingly important in today's blended and remote learning environments—difficult. Likewise, the TWM was 3.13 for troubleshooting and fundamental technical problem-solving, read as "Sometimes." Though this score implies a fair degree of ability, it shows that not all teachers believe they can manage fundamental technical concerns like internet disconnections or display issues that might interfere with the flow of a lesson.

These results have a major effect on our knowledge of the present condition of IT integration in small schools. Although the presence of basic IT skills is good, the absence of mastery in more complex or technical areas of technology use could restrict teachers' capacity to apply more creative, interactive, and flexible teaching strategies. Particularly in environments that call for remote or hybrid learning strategies, this could have an impact on both teaching effectiveness and student involvement. It also shows the potential digital divide between schools with more resources and training and those with less access to professional development. At last, the Lessons Learned from this assessment underline the need of ongoing training and capacity-building initiatives. Although it is praiseworthy that most teachers are skilled at using fundamental tools and including them into their courses, there is still a great need for focused interventions aimed at improving digital fluency, particularly in the use of online platforms and troubleshooting generic technical issues. Regular IT support, peer mentoring, and tailored workshops can help teachers to not only use technology more efficiently but also to be more confident and autonomous in controlling tech-related issues in the classroom. Ultimately, although the statistics from Table 2.a reveal that small school teachers are making notable progress in including technology into their teaching practice—particularly in terms of basic tool use and lesson integration—it also emphasizes the critical need to improve their skills in online tools and technical troubleshooting. Helping teachers to completely

use the potential of technology in education will depend on addressing these gaps, therefore enabling them to provide resilient, interesting, and high-quality instruction in the 21st-century learning environment.

This paper investigates Turkish in-service teachers' views on their technological competency in the learning and teaching process. The study used case study technique. The study's participants were 23 in-service teachers in Turkey for the 2019–20 academic year working there. Data was gathered using the questionnaire method. To this end, six open-ended questions were created. Content analysis was used in the data study. The study's results revealed that for in-class and out-of-class activities most teachers use technology in course content preparation and presentation to the students. Most of the teachers also found themselves lacking in their use of technology in the classroom. Finally, teachers said that online systems used during pandemic process allowed the continuity of education, gave chances for teachers to better themselves, strengthened family support, and offered flexibility. Ocak, G., & KaranfiL, B. (2021)

Table 2.b

Teacher Competencies in the Use of Information Technology in teaching learning process (Medium Schools)

INDICATORS	4		3		2		1			
	f	wm	f	wm	f	wm	f	wf	TWM	AI
Basic application software in IT like:	30	4	0	0	0	0	0	0	4	A
A. Word Processing Software	30	4	0	0	0	0	0	0	4	A
B. Presentation Software	24	3.2	6	0.6	0	0	0	0	3.8	A
C. Spreadsheets	28	3.73	2	0.2	0	0	0	0	3.93	A
D. Web Browsers										
Average									3.93	A
Online Tools and Platforms such as:	17	2.27	12	1.2	1	0.07	0	0	3.54	A
A. Email Platforms	2	0.27	14	1.4	12	0.8	2	0.07	2.54	S
B. Video Conferencing Tools	0	0	16	16	11	0.73	3	0.1	2.43	R
	20	2.67	1	10	0	0	0	0	3.67	A

C. Learning Management Systems **D. Search Engines**										
Average									**3.05**	**S**
Other tools in IT such as: **A. Basic Graphic Software** **B. Multimedia Players** **C. Antivirus and Security Software**	**14** **20** **13**	**1.87** **2.67** **1.73**	**11** **8** **9**	**1.1** **0.8** **0.9**	**5** **2** **8**	**0.33** **0.13** **0.53**	**0** **0** **0**	**0** **0** **0**	**3.3** **3.6** **3.16**	**A** **A** **S**
Average									**3.35**	**A**
Use technology to enhance student engagement in the following parts of the lesson: **A. Motivation** **B. Lesson Proper** **C. Assessment**	**28** **28** **20**	**3.73** **3.73** **2.67**	**2** **2** **9**	**0.2** **0.2** **0.9**	**0** **0** **1**	**0** **0** **0.07**	**0** **0** **0**	**0** **0** **0**	**3.93** **3.93** **3.64**	**A** **A** **A**
Average									**3.83**	**A**
Resolve basic technical issues **A. Can troubleshoot basic projector/ display connection issues** **B. Can troubleshoot**	**16** **12** **13**	**2.13** **1.6** **1.73**	**14** **15** **16**	**1.4** **1.5** **1.6**	**0** **3** **1**	**0** **0.2** **0.07**	**0** **0** **0**	**0** **0** **0**	**3.53** **3.3** **3.4**	**A** **A** **A**

basic internet issues										
C. Knows how to toggle airplane mode or reset network settings	**16**	**2.13**	**14**	**1.4**	**0**	**0**	**0**	**0**	**3.53**	**A**
D. Can update applications	**13**	**1.73**	**16**	**1.6**	**1**	**0.07**	**0**	**0**	**3.4**	**A**
E. Can troubleshoot audio/visual issues										
Average									**3.43**	**A**

3.25-4.00 Always 2,50-3.24 Sometimes 1.75-2.49 Rarely 1.00-1.74 Never

The data in Table-2B offers a thorough evaluation of teacher competencies in using Information Technology in the teaching-learning process across medium schools according to the IPAIL approach. The Interpretation stage determines five main areas of IT use where teacher competency is assessed: the use of basic application software (e.g., word processors, presentation tools, spreadsheets, and web browsers), online tools and platforms (including email, video conferencing, LMS, and search engines), other IT tools (such as graphics software, multimedia players, and antivirus software), the integration of technology to enhance student engagement across different phases of a lesson, and basic troubleshooting of technical issues. Every competency is assessed on a 1 to 4 scale with 4 representing the highest degree of proficiency. The total competency level is represented by weighted means, which are then read using adjectival ratings like "A" for Always, "S" for Sometimes, and "R" for Rarely. The data is neatly arranged during the Presentation phase to show the response frequency for each rating level, the related weighted mean, and the general average for every category. For example, in the field of fundamental application software, the weighted mean is 3.93, suggesting an advanced degree of competence among the instructors. Equally, in the field of using technology for student involvement, particularly during motivation, lesson proper, and assessment phases, the ratings are consistently high, with an overall average of 3.83. These figures imply that educators are successfully including basic IT tools and techniques into their teaching methods.

The Analysis stage exposes both advantages and areas needing development. Teachers are obviously quite skilled in using fundamental software tools like web browsers, presentation software, and word processors, which are often used in classrooms. They also show good ability to use technology to involve students at various points in a lesson, which is vital in keeping student interest and improving learning outcomes. Online tools and platforms, however, show significant shortcomings. The general weighted average for this field is just 3.05, which is seen as acceptable. Especially troubling are the low scores in the use of learning management systems and video conferencing tools, with some teachers rated in the remedial range. This suggests that although teachers might be knowledgeable about conventional IT tools, their

capacity to use more cooperative and remote teaching tools is constrained.

Though teachers in medium schools are usually good in the fundamental use of IT in education, their knowledge in more advanced or modern digital tools is lacking, according to the Inference stage. Given the growing dependence on online learning environments and digital communication tools, particularly in the context of blended or remote education models, this disparity is particularly important. These findings point to an urgent need for professional development programmes aimed at improving teachers' knowledge and use of these tools. Improving these domains will help to create more efficient and inclusive teaching methods, especially in situations demanding virtual student involvement.

At last, during the Linkage stage, the results may be directly linked to practical plans. This information should be used by educational leaders, school administrators, and legislators to guide the creation of focused training courses that cover the particular areas of weakness noted in the evaluation. Workshops and hands-on training courses on video conferencing software, email communication, and LMS systems should be given top priority, for instance. Schools should also take into account continuous support and mentoring to guarantee the practical use of these abilities. Schools can create a more digitally competent teaching staff by matching teacher development initiatives with the abilities underlined in the study, therefore enhancing the accessibility and quality of education.

Table 2.c

Teacher Competencies in the use of Information Technology in teaching learning process (Small Schools)

INDICATORS	4		3		2		1			
	f	wm	f	wm	f	wm	f	wf	TWM	AI
Basic application software in IT like:										
A. Word Processing	29	4	0	0	0	0	0	0	4	A
Software	29	4	0	0	0	0	0	0	4	A
B. Presentation	26	3.59	3	0.31	0	0	0	0	3.9	A
Software	29	4	0	0	0	0	0	0	4	A
C. Spreadsheets										
D. Web Browsers										
Average									3.98	A
Online Tools and Platforms such as:										
A. Email	21	2.9	8	0.83	0	0	0	0	3.73	A
Platforms	2	0.28	18	1.86	8	0.55	1	0.03	2.72	S
B. Video Conferencing	3	0.41	14	1.45	10	0.69	2	0.07	2.62	S
Tools	22	3.03	7	0.72	0	0	0	0	3.75	A

C. Learning Management Systems **D. Search Engines**										
Average									**3.21**	**S**
Other tools in IT such as:	**15**	**2.07**	**10**	**1.03**	**4**	**0.28**	**0**	**0**	**3.93**	**A**
A. Basic Graphic Software	**21**	**2.9**	**7**	**0.72**	**1**	**0.07**	**0**	**0**	**3.93**	**A**
B. Multimedia Players	**14**	**1.93**	**8**	**0.83**	**7**	**0.48**	**0**	**0**	**3.73**	**A**
C. Antivirus and Security Software										
Average									**3.86**	**A**
Use technology to enhance student engagement in the following parts of the lesson:										
A. Motivation	**27**	**3.72**	**2**	**0.21**	**0**	**0**	**0**	**0**	**3.93**	**A**
B. Lesson Proper	**27**	**3.72**	**2**	**0.21**	**0**	**0**	**0**	**0**	**3.93**	**A**
C. Assessment	**21**	**2.9**	**8**	**0.83**	**0**	**0**	**0**	**0**	**3.73**	**A**
Average									**3.86**	**A**
Resolve basic technical issues										
A. Can troubleshoot basic projector/ display connection issues	**18** **11**	**2.48** **1.52**	**11** **17**	**1.14** **1.76**	**0** **1**	**0** **0.07**	**0** **0**	**0** **0**	**3.62** **3.35**	**A** **A**
B. Can troubleshoot basic internet issues	**14**	**1.93**	**15**	**1.55**	**0**	**0**	**0**	**0**	**3.48**	**A**
C. Knows how to toggle airplane mode or reset network settings	**18** **14**	**2.48** **1.93**	**11** **15**	**1.14** **1.55**	**0** **0**	**0** **0**	**0** **0**	**0** **0**	**3.62** **3.48**	**A** **A**
D. Can update applications										

E. Can troubleshoot audio/visual issues										
Average									**3.51**	**A**

3.25-4.00 Always 2,50-3.24 Sometimes 1.75-2.49 Rarely 1.00-1.74 Never

Table 2C offers a methodical assessment of teacher competencies in small schools under the IPAIL approach with respect to their use of Information Technology in the classroom. Data *interpretation* shows five main areas: knowledge of other IT tools, use of online tools and platforms, proficiency in basic application software, ability to integrate technology for student involvement, and capacity to troubleshoot basic technical problems. Performance is read by adjectival ratings like "Always" (A), "Sometimes" (S), or "Rarelyl" (R) in each area evaluated by frequency distributions and weighted means. The *Presentation* of the findings shows data clearly categorize by indicator and competency level, therefore enabling a direct comparison of performance across several IT elements. For example, with an average weighted mean of 3.98 and an "Always" interpretation, teachers show great competence in using web browsers, presentation tools, and word processors. Averaging 3.86, the field of employing technology for student involvement also produces excellent results, especially in motivation and lesson delivery.

Moving into Analysis, it is clear that teachers in small schools have good basic IT knowledge and are efficiently using technology for instructional delivery and student participation. Online tools and platforms, such as video conferencing tools and learning management systems, reveal significant competency gaps, however. Rated only "Sometimes," these got lower weighted means of 2.72 and 2.62, respectively. This implies that while tiny school teachers are skilled in basic IT tools, they may find it difficult with more sophisticated, group-oriented, or remote learning technologies. The *Inference* stage indicates that although teachers' fundamental digital skills are well-developed, professional development is still required, especially in the use of virtual communication tools and online learning platforms. In modern classrooms where hybrid and online learning are growing more common, this is becoming more and more crucial.

These revelations ought to guide focused interventions by educational players. Training courses emphasizing underdeveloped skills like video conferencing and learning management system use should come first for school leaders and curriculum designers to give them top priority. To guarantee continuous development, these training s should be practical, context-sensitive, and ongoing. Ensuring access to required digital infrastructure in small schools will also help to properly use these tools even more. By means of this methodical IPAIL strategy, Table 2C not only emphasizes current strengths but also charts a definite course for improving digital teaching skills among teachers in small school environments.

Table 3.a

Challenges in Technology Integration (small schools)

INDICATORS	**4**		**3**		**2**		**1**			
	f	**wm**	**f**	**wm**	**f**	**wm**	**f**	**wf**	**TWM**	**AI**
A. Access to technology resources	**12**	**1.07**	**20**	**1.33**	**13**	**0.58**	**0**	**0**	**2.98**	**GC**
	13	**1.16**	**25**	**1.67**	**7**	**0.31**	**0**	**0**	**3.14**	**GC**

B. Unreliable internet connections	**4**	**0.36**	**12**	**0.8**	**21**	**0.93**	**8**	**0.18**	**2.27**	**MC**
C. Managing time for learning and applying new technologies	**0**	**0**	**6**	**0.4**	**18**	**0.8**	**21**	**0.47**	**1.67**	**NC**
D. Digital literacy gaps	**6**	**0.53**	**22**	**1.47**	**15**	**0.67**	**2**	**0.04**	**2.71**	**GC**
E. Technical issues like hardware or software malfunctions	**1**	**0.09**	**11**	**0.73**	**21**	**0.93**	**12**	**0.27**	**2.02**	**MC**
F. Technical support in the use of IT in the classroom	**4**	**0.36**	**11**	**0.73**	**21**	**0.93**	**9**	**0.2**	**2.22**	**MC**
G. Lack of opportunities for professional development in technology integration										

3.25-4.00 Very Great Challenge 2,50-3.24 Great Challenge
1.75-2.49 Moderstely Challenged 1.00-1.74 Not Challenged

Using the IPAIL method, Table 3A explores the various challenges small schools face when integrating technology into the teaching-learning process. The *Interpretation* stage identifies seven key indicators: access to technology, unreliable internet, time management for learning new technologies, digital literacy gaps, hardware/software malfunctions, availability of technical support, and professional development opportunities. These are measured using a four-point scale, with corresponding frequency counts, weighted means, and adjectival interpretations like GC (Great Challenge), MC (Moderate Challenged), and NC (Not Challenged). In the *Presentation*, the data is clearly organized to show how frequently each challenge is experienced and the degree to which it affects schools. Notably, unreliable internet and lack of access to technology resources are the most prominent issues, with weighted means of 3.14 and 2.98 respectively, both classified as “Great Challenges.” Digital literacy gaps and time management for learning new tech also appear to be significant issues, both rated as “Moderate Challenged.” During *Analysis*, it becomes evident that infrastructure-related problems—especially unreliable internet and lack of devices—pose the greatest barriers to effective technology integration. Additionally, a substantial number of teachers experience difficulties managing time to explore and implement new tech tools, suggesting a systemic issue related to workload or lack of structured training time. Technical issues like

hardware/software malfunctions and insufficient technical support are also seen as moderate obstacles, indicating that even when technology is present, there are ongoing support and usability concerns. In the *Inference* stage, these findings point to a layered problem: while teachers are expected to integrate digital tools into their pedagogy, they often lack the basic resources, stable infrastructure, and institutional support required to do so successfully. Furthermore, the limited opportunities for professional development in this area indicate a gap in long-term strategic planning for digital transformation in small schools. Finally, in the *Linkage* phase, the analysis suggests clear action steps for policymakers and school leaders. Investments must prioritize improving infrastructure—particularly internet reliability and access to devices. Equally important is the establishment of consistent technical support systems and the integration of regular, practical, and context-sensitive professional development programs. These should focus not just on digital tool usage, but also on time management strategies and pedagogical integration. Addressing these interrelated challenges systematically can create an enabling environment where technology can genuinely enhance teaching and learning in small school settings. Through this IPAIL-based approach, Table 3A not only highlights critical barriers but also sets a foundation for data-driven planning and intervention.

Table 3.b

Challenges in Technology Integration (medium schools)

INDICATORS	4		3		2		1			
	f	wm	f	wm	f	wm	f	wm	TWM	AI
A. Access to technology resources	2	0.27	12	1.2	12	0.8	4	0.13	2.4	MC
B. Unreliable internet connections	3	0.4	12	1.2	13	0.87	2	0.07	2.54	GC
C. Managing time for learning and applying new technologies	1	0.13	8	0.8	14	0.93	7	0.23	2.09	MC
D. Digital literacy gaps	0	0	4	0.4	13	0.87	13	0.43	1.7	NC
E. Technical issues like hardware or software malfunctions	2	0.27	10	1	9	0.6	9	0.3	2.17	MC
F. Technical support in the use of IT in the classroom	0	0	8	0.8	17	1.13	5	0.17	2.1	MC
G. Lack of opportunities for professional	0	0	8	0.8	17	1.13	5	0.17	2.1	MC

development in technology integration										

3.25-4.00 Very Great Challenge 2,50-3.24 Great Challenge
1.75-2.49 Moderstely Challenged 1.00-1.74 Not Challenged

Table 3.C
Challenges in Technology Integration (big schools)

INDICATORS	**4**		**3**		**2**		**1**			
	f	**wm**	**f**	**wm**	**f**	**wm**	**f**	**wm**	**TWM**	**AI**
A. Access to technology resources	**2**	**0.28**	**12**	**1.24**	**9**	**0.62**	**6**	**0.21**	**2.35**	**MC**
B. Unreliable internet connections	**2**	**0.28**	**11**	**1.14**	**12**	**0.83**	**4**	**0.14**	**2.39**	**MC**
C. Managing time for learning and applying new technologies	**0**	**0**	**7**	**0.72**	**13**	**0.9**	**9**	**0.31**	**1.93**	**MC**
D. Digital literacy gaps	**0**	**0**	**4**	**0.41**	**10**	**0.69**	**15**	**0.52**	**1.62**	**NC**
E. Technical issues like hardware or software malfunctions	**2**	**0.28**	**6**	**0.62**	**8**	**0.55**	**13**	**0.45**	**1.9**	**MC**
F. Technical support in the use of IT in the classroom	**0**	**0**	**7**	**0.72**	**20**	**1.38**	**2**	**0.07**	**2.17**	**MC**
F. Lack of opportunities for professional development in technology integration	**0**	**0**	**7**	**0.72**	**18**	**1.24**	**4**	**0.14**	**2.1**	**MC**

3.25-4.00 Very Great Challenge 2,50-3.24 Great Challenge
1.75-2.49 Moderstely Challenged 1.00-1.74 Not Challenged

Table 4.a
Support for Technology Integration (small schools)

INDICATORS	4		3		2		1			
	f	wm	f	wm	f	wm	f	wm	TWM	AI
A. The school provides IT tools and resources	17	1.51	26	1.73	2	0.09	0	0	3.33	SA
B. Training on the use of IT is conducted by the school	6	0.53	33	2.2	6	0.27	0	0	3	A
C. School policies actively encourage IT integration in teaching	16	1.42	27	1.8	1	0.04	1	0.02	3.28	SA
D. Peer mentoring programs are in place to share best practices	18	1.6	25	1.67	2	0.09	0	0	3.36	SA
E. Provision of IT tools and learning materials by:	12	1.07	21	1.4	11	0.49	1	0.02	2.98	A
1. LGU	0	0	4	0.27	31	1.38	10	0.22	1.87	D
2. NGO	0	0	2	0.13	25	1.11	18	0.4	1.64	SD
3. Alumni										

3.25-4.00 Strongly Agree 2,50-3.24 Agree 1.75-2.49 Disagree
1.00-1.74 Strongly Disagree

Using the IPAIL method, Table 4A explores the support for technology integration in small schools face when integrating technology into the teaching-learning process. The *Interpretation* stage identifies seven key indicators: The school provides IT tools and resources, Training on the use of IT is conducted by the school, School policies actively encourage IT integration in teaching, Peer mentoring programs are in place to share best practices, Provision of IT tools and learning materials by, LGU,NGO and Alumni. These are measured using a four-point scale, with corresponding frequency counts, weighted means, and adjectival interpretations like SA (Strongly Agree), A (Agree), D (Disagree, and SD (Strongly Disagree). In the *Presentation*, the data is clearly organized to show how frequently each support is experienced and the degree to which it affects schools. Notably, the school provides IT tools and resources has a total weighted mean of 3.33, the training on the use of IT policies actively encourage IT integration in teaching, the peer mentoring programs are in place to share best practices has a total weighted mean of 3.36 which Storngly Agree, and lastly the provision of IT tools and learning materials by: LGU, NGO, and Alumni has a 3.36 and with a adjectival interpretation of Strongly Agree.

Table 4B

Support for Technology Integration (Medium Schools)

INDICATORS	4	3	2	1	

	f	wm	f	wm	f	wm	f	wm	TWM	AI
A. The school provides IT tools and resources	**17**	**1.51**	**26**	**1.73**	**2**	**0.09**	**0**	**0**	**3.33**	**SA**
B. Training on the use of IT is conducted by the school	**6**	**0.53**	**33**	**2.2**	**6**	**0.27**	**0**	**0**	**3**	**A**
C. School policies actively encourage IT integration in teaching	**16**	**1.42**	**27**	**1.8**	**1**	**0.04**	**1**	**0.02**	**3.28**	**SA**
D.Peer mentoring programs are in place to share best practices	**18**	**1.6**	**25**	**1.67**	**2**	**0.09**	**0**	**0**	**3.36**	**SA**
E.Provision of IT tools and learning materials by:	**12**	**1.07**	**21**	**1.4**	**11**	**0.49**	**1**	**0.02**	**2.98**	
4. LGU	**0**	**0**	**4**	**0.27**	**31**	**1.38**	**10**	**0.22**	**1.87**	
5. NGO	**0**	**0**	**2**	**0.13**	**25**	**1.11**	**18**	**0.4**	**1.64**	
6. Alumni										

3.25-4.00 Strongly Agree 2,50-3.24 Agree 1.75-2.49 Disagree
1.00-1.74 Strongly Disagree

Table 4B the support for Technology Integration for medium school in Daraga South District. The first indicators which is the school provides IT tools and resources has a total weighted mean of 3.3 with the adjectival interpretation of Strongly agree, b. the training on the use of IT is conducted by the school has a 3 with the adjectival interpretation of Agree. The peer mentoring programs are in place to share best practices got a total weighted mean of 3.36 with the Adjectival Interpretation of Strongly Agree, lastly the Provision of IT tools and learning material by the LGU has a 2.98 and the NGO has a 1.87 and the lowest total weighted mean is the Alumni.

Table 4C

Support for Technology Integration (Big Schools)

INDICATORS	**4**		**3**		**2**		**1**			
	f	**wm**	**f**	**wm**	**f**	**wm**	**f**	**wm**	**TWM**	**AI**
A.The school provides IT tools and resources	**11**	**1.52**	**18**	**1.86**	**0**	**0**	**0**	**0**	**3.38**	**SA**
B. Training on the use of IT is	**3**	**0.41**	**23**	**2.38**	**3**	**0.21**	**0**	**0**	**3**	**A**

conducted by the school	**12**	**1.66**	**17**	**1.76**	**0**	**0**	**0**	**0**	**3.42**	**SA**
C.School policies actively encourage IT integration in teaching	**11**	**1.52**	**17**	**1.76**	**1**	**0.07**	**0**	**0**	**3.35**	**SA**
D.Peer mentoring programs are in place to share best practices										
E. Provision of IT tools and learning materials by:	**9**	**1.24**	**13**	**1.34**	**7**	**0.48**	**0**	**0**	**3.06**	**A**
1. LGU	**1**	**0.14**	**18**	**1.86**	**10**	**0.69**	**0**	**0**	**2.69**	**A**
2. NGO	**0**	**0**	**6**	**0.62**	**16**	**1.1**	**7**	**0.24**	**1.96**	**D**
3. Alumni										

3.25-4.00 Strongly Agree 2,50-3.24 Agree 1.75-2.49 Disagree
1.00-1.74 Strongly Disagree

The Table 4c which is the support for technology for big schools in Daraga south district. A.The school provides IT tools and resources has a 3.38 with the adjectival interpretation of Strongly Agree, Training on the use of IT is conducted by the school with total weighted mean of 3 for Agree and School policies actively encourage IT integration in teaching has a 3.42 which is the highest in big school in daraga the second highest is the Peer mentoring programs are in place to share best practices with the total weighted mean of 3.35 with the adjectival interpretation of Strongly Agree. Lastly the Provision of IT tools and Learning materials by the LGU has a 3.06 which is Agree and the NGO has 2.69 with the Adjectival Interpretation of Agree and Lastly the Alumni which is the only Disagree with total weighted mean of 1.96.

Conclusions

1. The evaluation of teachers' abilities in the use of information technology in the teaching-learning process showed that although many Daraga South District teachers have fundamental digital skills—such as using Microsoft Word, PowerPoint, and messaging apps—they often find it difficult include technology into more advanced instructional practices. Most teachers have little experience creating IT-supported courses that encourage active and cooperative learning and have no exposure to interactive educational tools. Their capacity to fully use technology as a tool for enhancing student results is hampered by this lack in digital pedagogical skills.
2. The assessment of obstacles teachers face in including technology into the teaching-learning process reveals several ongoing ones. Among the most urgent are the lack of tools including computers, projectors, and internet access—especially in schools in geographically underprivileged areas. Teachers have little access to organized ICT training as well, which leads to low confidence and

anxiety when using new technologies. Furthermore, tight teaching loads cause time limits that diminish chances for teachers to investigate, practice, and include digital tools into their courses. These difficulties taken together impede the regular and significant application of technology in the classroom.

3. The assessment of support systems meant to improve teachers' ability to use technology reveals that, although there are efforts, they are scattered and inadequate. Some schools have started internal support systems including peer coaching or limited IT-focused Learning Action Cell (LAC) sessions. Though they are usually one-size-fits-all and lack practical application, the Department of Education also provides occasional online training and webinars. Schools also differ in terms of support from school heads, access to digital resources, and the availability of follow-up mentoring. Teachers are therefore left to negotiate technological expectations with little ongoing direction and contextualized support.
4. Building a culture of technology integration in the Daraga South District calls for a coordinated, well-planned intervention that fosters mindset change, continuous learning, and system-wide cooperation—not only devices or training. Though lacking sustainability, coordination, and consistency across schools, current initiatives show promise. The district has to create an atmosphere where digital innovation is supported, encouraged, and celebrated as a shared objective if it is to really integrate technology into education and learning.

Recommendations

1. To address this, it is recommended that differentiated ICT training programs be implemented, catering to various competency levels—from basic to advanced. These training should emphasize hands-on, classroom-based applications to ensure immediate usability. Additionally, a digital competency framework aligned with DepEd's ICT integration standards should be developed to monitor progress and guide professional growth. Schools are also encouraged to establish peer mentoring systems and provide access to online learning platforms to foster continuous improvement and build teacher confidence in using technology effectively in instruction.
2. To address these issues, it is recommended that both institutional and community support be mobilized. Schools should collaborate with local government units (LGUs), non-government organizations, and private partners to improve access to digital tools and stable internet connections. Simultaneously, the Department of Education should roll out regular, context-specific ICT training programs with follow-up mentoring sessions. Furthermore, school heads are encouraged to implement flexible schedules or release time for teachers participating in tech-related capacity-building activities. By addressing these structural and skill-based barriers, the district can foster a more inclusive and supportive environment for technology integration.
3. To strengthen support for technology integration, it is recommended that a more structured and institutionalized system of professional development be established. This includes forming dedicated school or district-level ICT committees that will regularly assess teacher needs, organize targeted training, and provide ongoing mentoring. DepEd, in partnership with local government units and higher education institutions, should also provide more localized and practical workshops with post-training support. Recognition programs for tech-integrated teaching can further motivate teachers and promote a culture of innovation. Ultimately, sustained and well-coordinated support systems are essential to building teacher capacity and confidence in technology-enhanced instruction.

4. To achieve this, it is recommended that the district implement a comprehensive intervention plan titled "TECH4TEACH: Transformative Engagement and Capacity-building for Harmonized Technology Integration." This program should include differentiated ICT training, establishment of peer-led mentoring systems, regular tech-sharing sessions, and the creation of a centralized digital resource repository. Partnerships with LGUs, NGOs, and academic institutions should be strengthened to support infrastructure development and resource mobilization. Moreover, policies that recognize and reward digital teaching innovations can further inspire teacher participation. With a clear framework and community-wide involvement, Daraga South can nurture a strong culture of technology integration that benefits both teachers and learners.

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