

SPECIAL EDUCATION TEACHERS' CHARACTERISTICS AND THEIR PERCEIVED INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) INTEGRATION: AN INTERVENTION PROGRAM DESIGN

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mcb.velasco80@gmail.com**ABSTRACT**

In today's rapidly evolving information society, integrating Information and Communication Technology (ICT) into education has become essential, particularly for special education (SPED) teachers who support learners with special educational needs (LSENs). This study examines the relationship between SPED teachers' demographic characteristics and their perceived ICT integration in teaching at Zapatera Elementary School-SpEd Center and Lahug SpEd Center for the school year 2022-2023. The study specifically investigates teachers' demographic profiles—age, gender, highest educational attainment, ICT training hours, and access to functional ICT technology—and their self-assessed ICT skills, knowledge, and performance. Furthermore, it explores whether significant differences exist in ICT integration perceptions based on demographic variables and formulates action plans to enhance ICT competency among SPED educators. The findings reveal that while demographic attributes may influence perceptions of ICT integration, access to relevant training and functional technologies plays a more substantial role in shaping teachers' competencies. The results emphasize the need for targeted professional development programs that address SPED teachers' unique challenges, ensuring they acquire the necessary skills to integrate ICT effectively into their instructional practices. Additionally, institutional support, continuous training, and access to appropriate digital resources emerge as crucial factors in fostering a positive ICT integration climate. The study underscores that ICT is a powerful tool for enhancing inclusive education, improving student engagement, and promoting differentiated instruction. Based on these findings, an action plan is proposed to provide structured and sustainable ICT training for SPED teachers, ultimately bridging the digital divide and fostering an equitable learning environment. Future research should explore long-term impacts of ICT-focused interventions and additional factors influencing ICT competency, further strengthening technology-enhanced education for SPED learners.

Keywords: special education, ICT integration, SPED teachers, professional development, digital learning, inclusive education

INTRODUCTION

In this modern era where information age is relevant, the education system all over the world are undergoing a vast pressure to adapt contemporary modes of instruction. This is evident in special education (SPED), where the teachers need to respond to the developmental pedagogical mandates and embrace technology in facilitating various learning opportunities for learners with special education needs (LSENs). With this regard, Information and Communication Technology (ICT) offers revolutionary potential in opening education to become accessible, inclusive, and responsive.

The Information and Communication Technology (ICT) offers innovative potential in terms of leveraging education to a greater accessibility, inclusivity, and responsiveness (UNESCO, 2021). Yet there are challenges, particularly in response to the COVID 19 pandemic which served as the gateway to push for digital responses as it revealed infrastructure, capacity, and equity gaps (Bozkurt et al., 2020; Trucano, 2021).

ICT can be an enabler in enhancing engagement, customization, and better results for SPED students when used properly and integrated appropriately during classes (Adarkwah, 2021; Buabeng-Andoh, 2020). However, the tools are not equally accessible to all classes and their use hinges mostly on the initiative and technological proficiency of specific teachers (Gupta & Bhaskar, 2021). Its usage differs in frequency too since some uses them to reinforce skills and others to serve as a communication tool for non-verbal students (Lee & Ostwald, 2021). This connotes that assistive devices do not only enable participation and independence but also engagement and quantifiable academic progress (Nusantara, Pertiwi, & Yuliani, 2022). Younger educators can be more familiar with digital media and platforms while experienced teachers provided in depth pedagogy, however, could suffer from technological fluency (Zhao, 2020).

ICT integration in SPED learning and instruction tend to be informal and sporadic because technology is used by some teachers for one-on-one learning sessions or remediation. Some others are using them in routine assessments for their students. There is no concrete evidence for systematic professional development on ICT learning among SPED Teachers, the moment this study is conducted. Although some teacher received basic digital literacy

training, there is no continuous support and follow-up training and mechanism. There is sparse empirical evidence of ICT integration and its influence on learning outcomes among SPED students in the local context. One of the critical aspects examined in this study is the generational divide in ICT capability among SPED teachers.

This research focuses on two public elementary schools in Cebu City Division: Zapatera Elementary School and Lahug Elementary School, both serving diverse learners from predominantly low-income communities. These schools have established SPED classes to accommodate learners with varying disabilities—Zapatera caters to students with intellectual disabilities, while Lahug supports those with autism spectrum disorder and speech/language impairments. Each school's SPED population ranges from 20 to 35 learners, from Grade 1 to Grade 6, with individualized educational needs such as challenges in communication, mobility, cognition, and behavior regulation.

To address these needs, SPED teachers use various ICT tools, including tablets, laptops, projectors, and learning platforms like Google Classroom, MS Teams, and Zoom for remote instruction. Minimal assistive technologies such as speech-to-text software, visual schedules, and screen readers are also employed. However, despite the availability of these tools, there remains a significant gap in the teachers' capacity to integrate them effectively into instruction. Most teachers lack formal ICT training for SPED, causing inconsistent use in the classroom. Younger teachers are more knowledgeable and confident with ICT tools than older ones, revealing a clear generational gap. This calls for targeted training to bridge the difference in ICT proficiency.

This lack of structured professional development in ICT integration for SPED teachers highlights a critical gap that this study aims to address—by assessing their current level of proficiency and informing targeted action plans to enhance ICT-supported inclusive education. Hence, this research aims to bridge the gap by investigating the impact of ICT tools on learner engagement, understanding, and skill acquisition. It also attempts to take into consideration SPED teachers' readiness and competence in using ICT effectively. That knowledge gap calls for specific capability-building that combines digital competence with instructional skills.

Generally speaking, this research is confined within the limits of the two public schools with established SPED Programs. It can be observed that there exists variability in the availability of ICT tools and support services, which complicates the general concept of the findings. This research acknowledges the use of the assistive device which are important in enabling the SPED students to learn.

The findings of this study will help the researcher in the formulation of a customized intervention program design useful for both learners and teachers, specifically SPED teachers, to further extend and promote inclusive and equitable education in the two SPED School, Zapatera Elementary School and Lahug Elementary School. In this way, the researcher through the results of the study can inform and assist DepEd policy makers in crafting data-driven policies and guidelines that address the diverse needs of the learners with disabilities which will serve as the bedrock for levelling up effective practices across schools and districts. Moreover, the community will also be encouraged to take part in fostering a supportive and collaborative learning environment that reinforces the goals of inclusive education. Their active engagement is vital in the sustainability of the intervention programs ensuring a shared commitment to quality learning for all.

LITERATURE REVIEW

To strengthen and support this research, the researcher needs theories. The theories will be applied to the fundamental conditions to address the issue. As a result, the researcher will discuss various hypotheses regarding information and communication technology literacy, its integration, and its influences on SPED teachers' performance and LSENS' learning.

ICT in Education

Today, we can access some form of ICT in our daily lives without leaving our rooms or homes. Whether it is a computer, plasma TV, or cell phone, we all use them somehow. The common dream shared by everyone who uses ICT today is the desire to live connected lives (Bosamia, 2018). We refer to such technologies as mobile phones, digital cameras, and video cameras, for example, when thinking about the accessible Technology that provides these kinds of information, and occasionally a mix of all of them. Information can be presented in various ways, including text, graphics, sound, and video.

In the age of globalization, Education has been impacted by the development of information and communication technologies. Education is a system of continuing, regulated communication designed to support learning activities concerning learner preferences. Improving a learner's capacity for finding, managing, and evaluating information and communication knowledge is possible (Haleem, 2022). Information and communication technology has a more significant role in the present world since it can assist the contemporary approach of instructing learners in learning. Preparation for the complex process of integrating Technology into teaching and learning is necessary to make learning more meaningful and productive (Wu, 2021).

According to Jindal (2023), ICT is widely used daily, and its necessity in Education is constantly expanding. ICT in Education includes any mix of images, audio, videos, presentations, or any combination utilized for instruction. ICT in Education means utilizing information and communication to enhance education delivery. Therefore, the ideal way to deliver modern Education is through information and communication technology (ICT) and related resources. It is only achievable if teachers, particularly SPED teachers and students, are schooled in ICT. In addition, Quinn (2022) asserted that the English language is one of the most complicated academic fields. Teachers must create a

dynamic information and communication technology classroom environment to engage students in the topic. According to the justification provided, students highly appreciate ICT in the classroom. ICT can help teachers and students understand how to use it and improve the learning environment. Ronzhina, Kondyurina, Voronina, Igishev, and Loginova (2021) contend that professors can better support students by acting as mentors and facilitators of their learning in the digital age instead of simply disseminating information.

The Concept of ICT in Education

The concept of using Technology in Education spans several ideas. The idea that everyone can advance as far as feasible by using current information and communication technologies well must be realized. Bonifacio (2017) explained in his study that a framework for using Technology in a range of academic content area classes from kindergarten through high school would be provided by the Philippines' K--12 ICT curriculum standards. By articulating expected student performance in knowledge, abilities, and attitudes, grade 12 is a road map for curriculum decisions. Due to the most significant generational gap caused by the explosion of digital Technology, discussions have been held on how to effectively prepare children for the changing skill set needed to succeed in the 21st century (Wedlock & Growe, 2017).

They also provide teachers with illustrations of instructional techniques based on ICT that may be used to design lessons that will aid students in meeting learning objectives. These standards would be the foundation for developing an ICT integration curriculum for Filipino schools. The standards that will be utilized to create the curriculum will be chosen with care and tested for compliance. Teachers should refer to the targeted abilities for each subject area and grade level as they develop and implement their lessons. For students to demonstrate that they have mastered the standards, the selection and design of instructional activities and examinations must permit this. Standards help identify the knowledge or abilities that students need to succeed in the assessment.

Thus, information and communication technology (ICT) has altered the conventional or traditional learning model in Education, including computer-based learning, allowing students to select the learning resources that interest and motivate them (Omboto & Kanga, 2022). Every student should have access to sufficient opportunities and materials as part of the lesson plan. Various teaching strategies to accommodate students' needs and learning preferences practice the skills or information listed in the specifications. Although they expressed positive perceptions of measures to include information and communication technology, students did indicate negative attitudes toward rules that would restrict their use of these tools in the classroom (Vehedi et al., 2019). According to extensive meta-analyses, technology use in intervention research positively affects student motivation and learning (Fadda & Pellegrini, 2022).

To ensure that future educators, specifically SPED teachers, have the requisite technical skills, standards and recommendations for the subject matter of teacher education programs have been devised (Campanado et al., 2023). Instead of only focusing on essential technological abilities, the main emphasis has been on the knowledge and skills related to the educational use of Technology (Erstad et al., 2021). Furthermore, teachers must integrate Technology into the teaching and learning process to give students the skills they need for 21st-century job development (Harrell & Bynum, 2018).

However, while the study extensively discusses the potential benefits of ICT integration in Education, it also reveals a gap that requires further exploration. The gap lies in the extent to which SPED teachers are adequately prepared and equipped to effectively integrate ICT into their teaching methods and how this integration directly impacts the performance of SPED teachers and the learning experiences of LSENs. Despite recognizing the importance of ICT in Education, there needs to be a more comprehensive understanding and research on how SPED teachers who work with students with diverse learning needs adopt and adapt ICT tools in their classrooms. Observations from various educational contexts emphasize the importance of addressing this gap. Many SPED teachers may need more exposure to specialized training in using ICT to cater to the unique learning requirements of LSENs. They may encounter challenges in selecting appropriate technologies, adapting them to individual needs, and integrating them seamlessly into their teaching strategies. Furthermore, the diverse nature of disabilities and the need for personalized approaches in SPED classrooms add complexity to the effective utilization of ICT.

This gap in research and practice calls for a deeper investigation into the specific strategies, training, and support mechanisms required for SPED teachers to harness the potential of ICT for the benefit of their students. The study seeks to contribute to the existing body of knowledge by investigating several crucial dimensions related to integrating information and communication technology (ICT) in Special Education (SPED) settings. Firstly, it aims to assess the ICT literacy and competency level among SPED teachers, explicitly focusing on their familiarity with adaptive technologies and tailored strategies designed to cater to learners with special educational needs (LSENs). Secondly, the research aims to uncover the challenges and barriers that SPED teachers encounter when effectively integrating ICT into their instructional methods. By understanding these challenges, the study intends to illuminate how such obstacles impact the overall performance of SPED teachers. Additionally, the study explores both the direct and indirect effects of ICT integration on the learning outcomes of LSENs, considering crucial factors like engagement, motivation, and the development of essential skills. Lastly, based on the insights gathered, the research aims to propose strategies and recommendations for enhancing the seamless incorporation of ICT in SPED classrooms. These strategies encompass the development of specialized training programs, collaborative platforms, and networks for sharing valuable educational resources. Ultimately, through this comprehensive investigation, the study aims to

provide valuable insights that can empower SPED teachers to harness the potential of ICT effectively, thereby enhancing the educational experiences and outcomes of learners with special educational needs.

Addressing this gap, the study drew on a combination of theoretical frameworks. These may include theories related to educational technology adoption, inclusive Education, pedagogical content knowledge, and transformative learning. By integrating these theories and conducting empirical research, the study aims to provide practical insights that enable SPED teachers to harness the full potential of ICT in their classrooms, leading to improved learning outcomes for LSENS.

In conclusion, the research underscores the critical need to bridge the gap between ICT's theoretical potential in SPED education and its practical implementation. By exploring the challenges, experiences, and perspectives of SPED teachers, the study seeks to contribute valuable knowledge to the field and pave the way for more effective integration of ICT in SPED classrooms, ultimately enhancing the educational experiences of learners with special educational needs.

RESEARCH METHODOLOGY

This part covered the methodologies employed in the study, including the research design, participants, data gathering procedures, and analytical tools used to examine the relationship between nutritional status and reading performance.

Design

Descriptive quantitative methods were recognized for their ability to provide clear "snapshot" insights, enabling educators to capture the status of teacher competencies and ICT use while informing policy and practice. Comprehending the current state of ICT integration in Special Education (SPED) classrooms in both Zapatera and Lahug Elementary Schools was an effective way and was critical for developing and efficient, evidence-based strategies. Hence, this study employs a descriptive quantitative research design since its ideal for systematically measuring and describing relevant variables, without interfering causality, across a representative sample of SPED teachers.

Recent research supports this approach, for instance Ballon et al. (2025) used a similar quantitative method to assess ICT competencies among SPED teachers, finding significant gaps in operational and pedagogical skills despite strong ethical standards. In the same manner, Anderson & Putman (2020) and Jaafar et al. (2021) used such too and affirmed that descriptive surveys can effectively gauge teachers' attitudes, confidence, and perceived integration of technology, key factors that influence classroom practice. To determine whether there were significant differences in perceived ICT competencies across nominal variables, the Chi-Square Test was used along with Cramer's V to measure the strength of association.

The study generated actionable insights that guide the researcher in the creation of a tailored intervention program design which highlighted the prevalence, patterns, and levels of ICT integration through a structured questionnaires and descriptive statistics. This could guide the DepED policymakers in crafting responsive, data-driven policy, and empower SPED teachers and communities to collaboratively enhance inclusive learning environments.

Environment

This study was conducted in two SPED Centers in Cebu City Division: Zapatera Elementary School SPED Center and Lahug Elementary School SPED Center. These two schools serve learners with diverse learning needs. Each school has its own unique context in terms of infrastructure, facilities and community dynamics.

Facilities and Infrastructure

The first school, Zapatera Elementary School, is located at Sikatuna Street, Cebu City. It sits on a five-hectare property with seventeen (17) classroom buildings which was originally constructed under the Gabaldon Act. This law aimed to establish accessible public schools throughout the Philippines. The school now houses designated SPED classrooms equipped with basic ICT tools like laptops, projectors, and desktop computers. Nevertheless, the mentioned tools were shared among classes and were outdated. Specialized equipment was limited which included minimal accessibility features such as ramps and modified desks.

Whereas, Lahug Elementary School SPED Center is situated at the Lahug district and has evolved with the growth and development brought about by modernized classrooms, including dedicated spaces for SPED Learners. These classrooms accommodated children with autism spectrum disorder, intellectual disabilities, and speech/language impairments. Though the classrooms are modernized but the availability of ICT equipment was limited. There were few computer units, tablets owned by the teachers not solely provided by the schools and most of the assistive technology, such as screen readers or speech-to-text apps.

Social Context

The two schools created a small team of committed SPED teachers who were assigned to a specific disability category. They vary in age, educational background, and technological exposure. Most of them underwent limited ICT training, with limited number who have attended workshops focused on assistive technology or digital instruction. These teachers rely on peer sharing or informal collaboration to navigate digital tools.

The students at these schools include learners with intellectual disabilities, ASD, and speech impairments, ranging from Grades 1 to 6. Many of them benefit from individualized instruction and multisensory strategies due to the nature of their needs. Although students exhibited their interest in the use of technology, the provision of such was limited. Moreover, they need guided and structured access due to their varying cognitive and sensory capabilities.

Support systems vary between the schools for instance, in Zapatera, peer collaboration among the teachers was a key instrument for the utilization of ICT while in Lahug, parental engagement was needed and more evident. However, consistent school-community partnerships with NGOs or technology providers remain minimal leading towards the gap in the sustainability of ICT integration.

Cultural and Socio-Economic Context

The learners of both Zapatera and Lahug were children from low-to middle-income households. Majority of the families where the students came from cannot afford private SPED education or personalized assistive devices. Hence, economic hardship is prevalent in these two schools, and these impacted to the kind of support these learners received at home in terms of access to electricity, internet or devices.

Culturally, both schools are serious and sincere with the conformance of the mandate of the Department of Education for the inclusivity of learning. However, there was a lack of training in the part of some teachers on how technology can enhance SPED learning. This challenge was influenced by generational gaps, with older teachers and parents needing more exposure and orientation on how digital tools can support diverse learners.

Technological Environment

Both Zapatera and Lahug Elementary schools had an underdeveloped technological environment with relevance to the use of ICT technology tools for the teaching and learning of SPED. Moreover, there were limited technological tools, and the connectivity is often unreliable. There were no full-time ICT personnel, and the teachers are often the one who did the troubleshooting but had limited knowledge about it too.

Assistive technologies were either teacher-initiated or parent-donated and there was lack structured training programs specific to SPED ICT integration, although some teacher had attended general digital literacy workshops organized by DepEd.

Participants

This study involved two Special Education Teachers in the Cebu City Schools Division, particularly, Zapatera and Lahug Elementary Schools.

Inclusion Criteria

One of the criteria for choosing the respondents was that they should be actively teaching and providing special education services while using ICT tools in their teaching methods while teaching. They must show willingness to take part in the study which reflected their commitment in advancing knowledge in special education and technology integration.

Exclusion Criteria

Those teachers who were not handling special education classes were excluded from the study and those SPED teachers who did not employ ICT tools in the delivery of instruction. In this way the researcher would be able to keep focus on the gathering of insights from respondents with direct experience in the use of technology in special education aligned with the intention of this research.

The survey of this research targeted the twenty-four (24) SpEd teachers from Zapatera National High School SpEd Center and the nine (9) SpEd teachers from Lahug. All of them were engaged in the delivery of instruction with the use of ICT Tools to promote effective learning integration within their respective schools. This focused selection assured that the data collected were relevant to the study's objectives and ultimately addressed the gap stipulated therein.

Table 1

Distribution of the Participants

Respondents	Frequency	Percentage
ZNHS SpEd Center	24	72.72
Lahug SpEd Center	9	27.27
Total	33	100

Note. $n = 33$

The data in the table above showed that most of the respondents came from Zapatera National High School SpEd Center while only a few came from Lahug SpEd Center. This indicated that most of the data gathered largely covered the experiences and perception of SpEd teachers in Zapatera.

The results of the study largely gleaned the practices, adversities and perspectives of the ZNHS SpEd Center since most of the participants were from this center. This suggested that careful analysis of the results was needed especially in establishing the generalization.

Sampling Technique

Total enumeration was used in this study which meant that the entire population who fits into its purpose was included. This meant that the data collected from every participant was within the study's scope, leaving no chance for sampling error.

Firstly, total enumeration permitted for a balance and accurate representation of all SpEd teachers. It was more practical to survey everyone rather than just smaller sample since SpEd teachers make up a smaller and more specific group. By doing so, such method captured any differences or unique traits more effectively without worrying about sample biases.

Secondly, SpEd teachers played a key role in providing specialized education to students in varying learning needs which meant that their job often included a vast range of teaching methods, approaches and strategies. It was then important to assess their ICT skills and gradually evaluate them to clearly find out their capabilities as regards to ICT tools integration in the delivery of classes to achieve quality education for special education learners.

Moreover, the utilization of total enumeration ensured that the SpEd teachers were included in this research for a better and comprehensive analysis of their ICT competencies. This was carefully considered since it is relevant given the potential variability in ICT adoption and integration among SpEd teachers.

Instruments

The study aimed to gather comprehensive results relevant with the integration of Information and Communication Technology (ICT) among the Special Education (SpEd) teachers in Zapatera NHS and Lahug NHS. To make the findings aligned with the research objectives, standardized questionnaires were utilized from two sources. This was to ensure robust and well-rounded approach in the conduct of the study of which two sections were considered, section one was about the demographic profile and section two about the extent of the use of ICT tools as perceived by the SpEd teachers in terms of their skills, knowledge, performance and attitude.

The first section of the questionnaire focused on capturing demographic information from the participating SPED teachers. It encompassed four categories designed to characterize the background of the respondents. This section established a context for the subsequent analysis but also aids in identifying potential patterns or trends related to ICT integration. This was adapted from Oducado, R. M. F., et al. (2020). "Teachers' Profile and Online Teaching Readiness in the New Normal" – Asia Pacific Journal of Multidisciplinary Research. It encompassed six categories designed to find out the background of the participants such as the age, gender, length of service in teaching SpEd, highest educational attainment, ICT Trainings Attended, and the ICT functional technology used. This section created a context for the comprehensive analysis which aid in identifying potential patterns or trends relevant to ICT integration in the delivery of instruction.

The second section of the questionnaire focused on how the participants perceived their integration of ICT in terms of their own skills, knowledge, performance and attitude towards the use of the ICT tools. This part of the study includes both technical proficiency in the application of digital tools to achieve a multifaceted view of ICT integration in the teaching and learning process. A four-point Likert scale was used to allow the research participants to express clearly their perceptions on the various items with relevance to the use of the ICT tools. By doing so, a deeper understanding on how SpEd teachers' perception in their capability and actual practice in integrating technology in the classroom was realized.

This section used an adapted standardized questionnaire from Babyeva (2021) to ensure validity and reliability of the instrument. It used an established source which upheld the academic integrity of the research while also adhering to ethical standards by recognizing the original author's contribution. The questionnaire underwent expert validation to ensure content relevance and clarity using Cronbach's Alpha reliability analysis. Based on the source this was conducted on the pilot data, yielding an overall alpha coefficient of $\alpha = .85$, which indicates good

internal consistency based on accepted benchmarks ($\alpha \geq .70$ is acceptable; $\alpha \geq .80$ is good). This result confirmed that the items were strongly aligned in measuring the constructs of ICT integration, specifically in terms of teachers' self-assessed knowledge, skills, and performance. Hence, the researcher with confidence adapted such as the blueprint in gathering the data of this paper.

Data Gathering Procedure

Pre- Data Gathering. Researcher sought approval to conduct the study to the Cebu City Superintendent to Dr. Nimfa Bongo. Prior to the actual conduct of the study, the researcher seeks approval from the Dean of the Graduate School, University of Visayas to formally conduct the study. After the approval, the researcher gives courtesy letters to the School Head.

Actual Data Gathering. Conduct of the Questionnaire. With such permission, the researcher sent a letter that contains a brief explanation and purpose about the study to the teachers for their approval to be the respondents of the study. After the letter's approval, the researcher personally administered the answering of the questionnaire to the respondents through Google Forms to limit the contact between the researcher and the respondents and as part of the COVID-19 Protocol. The researcher retrieves and follows up the questionnaires for further analysis and interpretation of data.

Post Data Gathering. A statistician accredited by the school compiled and computed the data for this research instrument so that it calculated and interpreted following the frequency of items checked by the study's respondents. In addition to secondary resources like published articles and related literature, the researcher will use primary data to corroborate the survey's findings. The data is was be kept with utmost care and confidentiality digitally.

Data Analysis

Descriptive statistical approaches would be used to display, characterize, evaluate, and infer the data received from respondents via survey questions. The respondents' profile in terms of age, gender, average number of LSEs per class, teaching hours per week will be presented and described using frequency distribution. The percentages of each respondent's profile were computed to statistically and generally describe them.

Again, the frequency distribution was employed to illustrate and explain the subject profile regarding age and gender. To describe the subjects numerically and broadly, percentages of their profiles was determined. A Weighted Mean was calculated to determine the perceived level of technology Integration Knowledge of Teachers. A one- way analysis of variance (ANOVA) was used to test for a significant relationship between teachers' literacy in information and communication technology and the extent of integration in teaching early childhood education.

Ethical Consideration

The study was conducted in accordance with the guidelines outlined in the Declaration of Helsinki (World Medical Association, 2013). The researched sought the approval from the Research and Ethics Committee of the University of the Visayas with the Reference No. NTPMAED2025-365 dated March 17, 2025. The study involved SpEd teachers, who voluntarily participated in both online and onsite survey. Before the completion of the questionnaire, risks and benefits, confidentiality measures, voluntary participation, and contact information. There were no financial incentives offered for the involvement of this research. The authors declared no conflicts of interest.

RESULTS AND DISCUSSION

This part of the study showcased the results and discussion based on the findings of the study such as the demographics profile of the participants, their characteristics and perception in the integration of ICT tools in the delivery of instruction towards the learners with special needs.

Demographic Profile of the Respondents

The following tables display the demographic profile of the respondents, including information such as age, gender, length of teaching service, highest educational attainment, no. of hours of relevant related trainings and number of ICT functional technology.

Table 2

Profile of the Participants

Profile	<i>f</i>	%
Age		
51-65	2	6.06
36-50	17	51.52
21-35	14	42.42

Gender		
Male	3	9.09
Female	30	90.91
Length of Teaching Service		
31 – 40 years	2	6.06
21- 30 years	9	27.28
11 – 20 years	8	24.24
6 – 10 years	9	27.28
1-5 years	5	15.15
Educational Attainment		
Doctorate Degree	2	6.06
Units in Doctorate	1	3.03
Master's Graduate	9	27.28
With Master's Units	8	24.24
Bachelor's Degree	13	39.39
ICT Trainings Attended		
District Training on DepEd Computerization Program (DCP)	2	6.06
Online Course: "Blended Learning for Inclusive Education"	33	100.00
"Readiness of Teaching and Non-teaching Personnel on the Use of Online Educational Technology Tools for Instructional Delivery"	28	84.85
"Accelerating Learning Opportunities with Different Learning Delivery Modalities"	33	100.00
Virtual In-Service Training for Public School Teachers (March 15–19, 2021)	30	90.91
ICT District Orientation-Workshop for School Data Management (March 26, 2021)	30	90.91
In-Service Training: "Strategies for Online Teaching and Learning with Interactive Games and Platforms" (June 28, 2021)	28	84.85
Number of Hours of Relevant ICT Trainings Attended		
40 and above	11	33.33
17-39	12	36.36
1-16	10	30.30
Number of ICT Functional Technology		
5 and above	6	18.18
3-4	22	66.67
1-2	5	15.15

Note. $n=33$

Age

Table 2 revealed that the participants of the study came from varying age range, with a noticeable concentration mid-career teacher with lower involvement from older teachers. Most of them fall within the 36–50 age bracket, followed by those in the younger 21–35 range, while only a few belong to the 51–65 group. This varied age groups provided a valuable combination of teaching experience and adaptability especially in relation to the use of ICT tools in the delivery of instruction.

Bellotti et al. (2022) highlighted that age diversity plays a crucial role in shaping the perception and engagement with ICT integration in the classroom. This means that fostering a positive age diversity climate in the workplace can augment job satisfaction and reduces burnout thereby getting rid of turnover intentions. OECD (2020) supported this notion that age diverse network of teachers can contribute to productivity and innovation indicating that educators in the younger age groups are often more fluent and receptive in the use of technological tools while those in the older cohort which may face challenges in confidence, familiarity or even more motivation in using ICT. However, this can be addressed if synergy has to be applied, taking the lead should be the school head.

This implied that there is the necessity to implement ICT capacity building to as an age-responsive approach. Encourage older SpEd teachers to be more adaptive by providing them support to build confidence in using digital tools while younger educators may benefit from more advanced, creative, or specialized ICT training modules. By addressing these generational needs, the challenges can be eradicated and the promotion of inclusivity as regards to technology adoption shall prevail.

It is then recommended that professional development program can be strategically designed to address the gap. Mentorship program can be deployed through a school-based ICT training which have tiered with providing basic and user-friendly sessions to older educators while offering a more dynamic and innovative training to the younger ones.

Gender

Table 2 showed that the participants of this study are predominantly composed of female teachers. Understanding how gender may influence teachers' perspectives and practices is crucial in designing inclusive

strategies for ICT integration. This suggested that age does not serve as significant challenge in the acquisition and application of ICT skills in the classroom.

This implied that it is important to address the accessibility of ICT tools as well as the self-perception and confidence levels of the teachers when using the technology. This means that at times teachers' engagement with digital tools may not heavily influence ICT effectiveness in pedagogy but somehow may empower them to feel in doing so. By increasing their digital confidence and competence, this may benefit female educators in promoting an emotionally responsive learning environment that emphasized collaboration and peer mentoring.

It was recommended that a professional development program be designed to achieve an inclusive and gender-sensitive teaching with the use of ICT tools. The training sessions in this program plan should be supportive to a culture where both male and females SpEd teachers can thrive, contribute and enhance their digital literacy. There should also be opportunities for shared learning, co-teaching, and differentiated support that shall be embedded in ICT training structures. It is but fitting to provide equitable access to resources, tailored support system and collaboration among teachers regardless of gender to effectively deploy ICT integration.

Length of Teaching Service

The participants vary in the year of teaching experience, ranging from veteran and newbie in the field. This spread enriches the collective teaching experience and wisdom with openness to new approaches.

Experienced teachers may rely on traditional methods and require more exposure to ICT tools, while early-career teachers may lack confidence in integrating technology despite familiarity with digital platforms. This can be addressed through a sufficient training and moral support coming from the school head and other personnel.

Hence, school heads in collaboration with the SpEd teachers must implement tiered ICT capacity building program design based on the needs assessment and experience combining technical training with peer mentoring and real – life classroom application.

Highest Educational Attainment

The participants of this study had a diverse academic qualification ranging from bachelor's degrees to postgraduate degrees including master's and doctoral levels. This varying educational attainment shows advantage for all the participants since they got different theoretical backgrounds, teaching experiences and possible readiness to use information and communication technology (ICT) in the classroom. This means that those teachers with higher levels of educational attainment are more aware of research-based practices in ICT use. Whereas those with only an undergraduate degree can also be effective way in availing learning opportunities like more basis training and organized support to gain the same confidence and skills in using ICT.

This implied that this variation in the educational attainment welcome differentiated approaches in engaging with ICT integration. Hence, the effectiveness of ICT integration depends not solely on academic attainment but on the continuous development of digital competencies through targeted professional training.

It is therefore recommended that ICT workshops that focus on researched –base instructional design be developed which covered digital pedagogy leadership, or data informed technology integration. Both ZNHS and Lahug NHS can ensure that all teachers, regardless of academic qualification are empowered to integrate ICT effectively and confidently into their SpEd classroom if such professional development is customized based on their needs such as their educational attainment.

ICT Trainings Attended

The data showed that all participants have attended ICT-related training sessions, many of which had focused on inclusive and blended learning approaches, strategies and innovations. All these training is DepEd initiated training. This indicated that institutional efforts equipped the teachers in the digital teaching competencies.

However, the true measure lies on how well the learnings that they had acquired be applied in the classroom delivery of instruction. Because it is important to note that skills from one-time trainings may fade over time if without sustained practice.

Is then suggested that a follow-up systems have to be established for instance peer coaching, ICT learning collaboration or classroom-based ICT performance reviews are done to ensure continuous learning and implementation.

Number of Hours of Relevant ICT Trainings Attended

The data indicated that majority of the participants had completed 17 to 39 hours of ICT – related training, while some received 40 hours more and a portion of them had minimal exposure with only 1-16 hours. This expressed a differing level of learning experiences and digital competence from among the participants. This means that while some possessed moderate to extensive ICT training, some others may lack sufficient exposure.

The results implied that those teachers with fewer training hours may be not prepared to effectively integrate ICT in the delivery of lesson which may limit their capacity to apply inclusive and technology-driven instruction. This reality may result to inconsistencies in instructional quality and reduced engagement for learners with special needs.

Starks and Reich (2022) noted that the lack of inclusive training and less infrastructure may create barriers to effective ICT use in special education. This was supported by Theobald and Velez (2022) emphasizing that insufficient ICT exposure can hamper effective learning design while Johnson et al (2020) argued that multimedia tools improve student engagement and learning outcomes is used properly.

It is then recommended that the institutionalization of a minimum number of ICT training is a dire need. Hence, school leaders may deploy such for all SpEd teachers per year to establish a baseline of digital competence. The trainings should be more flexible and modular in type and to make it more aligned with the latest trend, they should offer both asynchronous and in person options. Specialized modules must be included and cover assistive technology with inclusive digital teaching and differentiated instruction. This will improve the overall quality of inclusive teaching practices. These measures will support collaboration among educators, students, and even parents (US Department of Education, 2021)

Number of ICT Functional Technology

Table 2 showed that most of the SpEd teachers have access to 3 to 4 ICT tools, while a few have 5 or more and some teachers only have 1 or 2. This showed clear differences in the availability of resources. This meant that even if teachers were trained, having limited ICT tools can hamper its integration the delivery of instruction for students with special needs. This somehow affected how well then can apply technology in teaching.

This implied that when teacher have more ICT tools, they would have the opportunity to use a wider range of approaches and strategies which may support students with special needs. However, when resources are of scarce, this can lead to limited use of ICT not because of lack of effort but because of its limited access. According to experts more tools improve student engagement and teacher confidence Smith and Jones (2019) and Brown et al. (2020). This was also supported by Johnson et al. (2018) who stated that access to more ICT tools ca led to better instruction and learning outcomes.

It is the recommended that SpEd schools must invest in updating and fairly distributing ICT tools in all classrooms, so that students would have the opportunity to be exposed to those, thereby promote learning effectively. In this manner the teachers will be helped especially in the application of knowledge from what they learned in the trainings that they have been exposed with. Hene, this would give equal learning opportunities to leaners as well as benefit them from technology in learning.

Extent of the Respondents Perceived ICT Integration

This part of the findings discussed the extent to which special education (SpEd) teachers perceived their integration of Information and Communication Technology (ICT) in teaching which covered four elements such as skills, knowledge, performance, and attitude. The elements the technical ability of the teachers in the use of ICT tools as well as their perception and concept on how to use technology efficiently. In this way the teaching and learning shall be enhanced especially during the actual classroom practices, and on their personal disposition, skillset and mindset towards the use of digital resources. This led to the realization of the study's aim which was to provide a comprehensive view of how ready and confident the teachers in the application and integration of ICT with the context of inclusive education.

Skills

Proficiency in various skills is imperative for each educator, most especially SpEd teachers whose intention is to work in an inclusive classroom. These teachers must ensure that their teaching methods promote active engagement, accessibility and meaningful learning experience to promote the uniqueness of each learners needs, especially that these learners differ in the way they exist in the word of Special Education. They need a strong foundation of understanding as regards to teaching strategies od which should be designed for the diverse learners such as differentiated instruction, adaptive teaching methods as well as individualized education plans (IEPs). They must also have a strong communication and collaboration skills to effectively build a network in addressing the concerns of the students. This can be achieved through building connections with the parents, caregivers, therapists and other the people in the community which can help the students with special needs.

SpEd teachers must also demonstrate proficiency in integrating ICT tools in thei teaching practices. Since the development of technology is as fast as how the time fleets increase reliance in digital tools for education encouraged them to be adept and the utilization of assistive technologies, interactive learning platforms, and virtual resources. This can be achieved through enhanced student involvement and accessibility, through speech-to-text software for students with writing difficulties, using visual aids with cognitive impairments or by levelling up the use of collaborative tools to facilitate remote learning. This can harness their skills in the effective use of technology which can gradually impact learning outcomes with their students. It is then essential to empower SpEd teachers in creating inclusive and dynamic learning environments.

Table 3

Respondent's Perceived ICT Integration in Terms of Skills

Skills	Weighted Mean	Verbal Description
1 I can use emails to communicate with others through group sites, blogs, etc. for disseminating information to stakeholders	3.25	Expert
2 I can capture and edit digital photos, movies or other images	3.40	Expert
3 I can create a database and/or edit a questionnaire online containing internet links and images	3.05	Experienced
4 I can organize computer files in folders and subfolders	2.90	Experienced
5 I can use MSWord, spread sheet (e.g., Excel), plot a graph and use appropriately slide presentations,	2.40	Experienced
6 I can use a wide range of teaching approaches with ICT and develop technology mediated learning activities	2.80	Experienced
7 I can select appropriate content-specific technological tools to support teaching and learning	3.40	Expert
8 I can find relevant e-resources to supplement my instruction.	2.20	Developing
9 I can use various synchronous and asynchronous communication tools effectively.	2.80	Experienced
10 I integrate videos, audio, and other media in the classroom discussion.	2.65	Experienced
Total	2.96	Experienced

Note. n=33 Legend: Note: n=33 Expert 3.50 – 4.00; Experienced 2.50 – 3.49; Developing 1.50 – 2.49; Beginning 1.00 – 1.49

The findings in the table hold significant implications for the field of special education. Most respondents, with a weighted mean of 2.96, perceive their ICT integration skills to be at an 'Experienced' level. This high level of proficiency is a promising indication for special education teachers, who are increasingly required to integrate technology effectively in their teaching practices.

While the respondents demonstrate a high level of proficiency in the first three skills, which are fundamental in communication and collaboration, there are areas that require further attention. For instance, the respondents consider themselves 'Experienced' in the fourth highest skill, editing text online containing internet links and images, with a weighted mean of 2.9. This suggests a need for additional training in this skill to enhance their proficiency.

The lowest skill level, organizing computer files in folders and subfolders, with a weighted mean of 2.2, indicates an area for potential growth and improvement. Mastering this skill can significantly enhance the management of digital resources, ensuring that files are easily accessible and retrievable. This, in turn, can further improve the effectiveness of technology integration in special education.

These results were aligned with the literature on ICT integration in special education, emphasizing the importance of providing special education teachers with the necessary ICT skills to effectively integrate technology into their teaching practices. Assistive technologies, such as screen reading software, adapted keyboards, and screen keyboards, can provide convenience and support for students with special educational needs in learning new skills and acquiring information.

A study by Al-Azawei et al. (2016) found that special education teachers in the United Arab Emirates had a positive attitude towards ICT integration in their teaching practices, with a mean score of 3.9 out of 5. The study also found that the teachers had a high level of proficiency in ICT skills, with a mean score of 4.1 out of 5.

Another study by Al-Hadabi and Al-Hosni (2015) found that special education teachers in Oman were highly proficient in ICT skills, with a mean score of 4.2 out of 5. The study also found that the teachers had a positive attitude towards ICT integration in their teaching practices, with a mean score of 4.1 out of 5.

A systematic review by Tondeur et al. (2016) found that special education teachers' ICT skills and knowledge were positively associated with their intention to integrate ICT into their teaching practices. The review also found that teachers' confidence in using ICT was positively associated with their actual use of ICT in their teaching practices.

Knowledge

Knowledge is power so to speak, for educators it serves as the cornerstone of effective teaching strategies. Through the knowledge of ICT SpEd teachers would be able to assess themselves as to their capability in the operation of ICT tools in the classroom when handling students with special needs. Hence this part measures the extent of knowledge of the SpEd teacher with relevance to ICT integration.

Table 4

Respondent's Perceived ICT Integration in Terms of Knowledge

Knowledge	Weighted Mean	Verbal Description
1 I know how to utilize ICT tools to meet lesson objectives.	3.50	Expert

2	I know how to use various technologies.	3.25	Experienced
3	I am aware of the great opportunities that ICT offers for effective teaching	3.45	Experienced
4	I know how to integrate ICT into my teaching to address content standards.	3.30	Experienced
5	I can combine the subject content, technology, and teaching approaches/strategies in the classroom.	3.15	Experienced
6	I can incorporate ICT into my lessons to boost student creativity	3.35	Experienced
7	I apply electronic assessment tools (e.g., online quizzes, project submission portals) to evaluate student performance.	3.35	Experienced
8	I guide students in using technology responsibly and effectively for class projects and presentations.	3.45	Experienced
9	I adapt to new ICT tools and platforms to continuously improve my teaching practices.	3.50	Expert
10	I differentiate instruction using ICT to accommodate diverse learning needs and styles in the classroom.	3.45	Experienced
Total		3.38	Experienced

Note. $n=33$ Legend: Note: $n=33$ Expert 3.50 – 4.00; Experienced 2.50 – 3.49; Developing 1.50 – 2.49; Beginning 1.00 – 1.49

The data in Table 4 indicated that the SpEd teachers generally had a positive perception towards ICT integration. This means that the highest agreement in their ability to utilize ICT tools to achieve the lesson objectives with the subject content and upon the use of technology, and teaching approaches in the classroom was evident. (Akram et al., 2022). However, there is a noticeable difference in their perceived skills in developing technology-mediated learning activities, which received the lowest weighted mean (Abel et al., 2022). This discrepancy may indicate a need for targeted professional development to enhance teachers' skills in creating technology-enhanced learning experiences.

Related studies have highlighted the importance of teachers' perceptions and beliefs in effective technology integration (Kharam et al., 2022). Teachers' instructional practices are significantly affected by their pedagogical strategies and existing beliefs about the nature of teaching and learning (Qasem & Viswanathappa, 2016). Hence, it is significant to consider the teacher's perspective when implementing ICT integration initiatives, approaches and strategies. These findings implied that SpEd teacher often face unique odds in integrating technology due to the diverse needs of the students and the specialized nature of the subject content. Therefore, it is essential to provide them with targeted professional development opportunities that align with their pedagogical strategies and beliefs about teaching and learning. This could involve instruction on crafting technology-facilitated learning tasks tailored to address the varied requirements of students with disabilities.

Although teachers have a generally positive perception towards ICT integration, they as well must enhance their skills in the development of a technology-mediated learning activity. By considering these perceptions and beliefs, the teachers with the support of the educational institutions can create a more effective ICT integration initiatives which conforms with the teachers' instructional practices and enhance students' learning experience.

Performance

This part of the findings assessed the fundamental commitment to fostering every student's academic, social, and emotional growth. The performance of the special education teachers stands as a linchpin in facilitating meaningful and inclusive educational experiences. In SpEd teaching, the challenges and complexities for diverse learning needs are paramount, it is for this reason that the performance of the participants were assessed to check if they were indeed into ICT integration.

Table 5

Respondent's Perceived ICT Integration in Terms of Performance

Performance	Weighted Mean	Verbal Description
1 I engage in the use of ICT in broader skills.	3.35	Experienced
2 I execute appropriately slide presentations, videos, audio, and other media	3.05	Experienced
3 I teach students to use various multimedia materials for reports	3.15	Experienced
4 I can combine content, technology, and teaching strategies.	3.05	Experienced
5 I can incorporate ICT into lessons to boost student creativity.	2.90	Experienced
6 I efficiently use ICT tools to prepare and organize teaching materials within a reasonable time.	3.20	Experienced
7 I implement ICT strategies that increase student participation and	3.00	Experienced

	classroom interaction.		
8	I maximize instructional time by using ICT, allowing me to provide more individualized support to students.	3.20	Experienced
9	I can adapt my teaching practices to remain effective with or without the use of ICT tools.	3.00	Experienced
10	I integrate ICT to develop students' higher-order thinking, creativity, and problem-solving skills.	3.20	Experienced
Total		3.11	Experienced

Note. $n=33$ Legend: Note: $n=33$ Expert 3.50 – 4.00; Experienced 2.50 – 3.49; Developing 1.50 – 2.49; Beginning 1.00 – 1.49

The data from Table 3 revealed that the respondents generally perceived themselves as "Experienced" as regards to integrating ICT in their classroom teaching. Among the ten indicators, the highest ratings (3.50) were in areas where respondents identified themselves as "Expert", specifically in utilizing ICT tools to meet lesson objectives and in adapting to new ICT tools and platforms for instructional improvement. Other indicators, such as guiding students in responsible technology use, differentiating instruction through ICT, and applying electronic assessment tools, received slightly lower ratings but still fell within the "Experienced" category. This suggested that although the SpEd teachers in ZNHZ and Lahug NHS were mostly confident in using ICT tools, challenges were still encountered by them as regards to the usage of advanced and transformative integration in conformance with the content standards and pedagogical strategies.

These findings implied that teachers had a strong foundational knowledge of ICT integration and were comfortable in the utilization of technology in their classrooms. However, their application was not yet an expert level pertaining to the practice across all the dimensions. The data suggested that a more in depth and a more strategic use of ICT which was aligned with the subject content was necessary. In this way teachers could welcome student creativity with the use of differentiated instructional materials. This means that continued professional growth was needed with full potential about ICT integration to enhance learning outcomes and support 21st century teaching standards.

It is recommended that ZNHS and LNHS school heads must take the lead in the implementation of targeted professional development programs which focused on advanced ICT pedagogy to bridge the gap between experienced and expert ICT integration. Trust, Krutka, & Carpenter (2020) emphasized that effective professional learning should be sustained, context-specific, and focused on classroom application. This was supported by Li & Yang (2021) when they posited that the training must include content-specific digital tools, technology-enhanced instructional design for diverse learners, and the integration of formative digital assessments. Philips (2020) probed that further provision of peer collaboration opportunities, coaching, and reflective practice increases the likelihood of meaningful ICT adoption. Chen and Tsai (2020) added that ongoing institutional support and training are essential for assisting and helping SpEd teachers transition from basic ICT use to transformative digital pedagogy that enhances student engagement and learning outcomes.

Table 6

Respondent's Perception and Attitude towards ICT Integration

	Perception and Attitude	Weighted Mean	Verbal Description
1	ICT allows students to be more creative and imaginative	1.35	Beginning
2	The use of ICT helps students to find related knowledge and information for learning	2.05	Developing
3	The use of ICT encourages students to communicate more with their classmates	1.89	Developing
4	The use of ICT increases students' confidence to participate actively in the class	3.05	Experienced
5	I think students learn more effectively with the use of ICT.	2.90	Experienced
6	I think the use of ICT helps to broaden students' knowledge paradigm.	3.18	Experienced
7	I think the use of ICT helps to improve students' ability specifically in reading and writing.	2.90	Experienced
8	The students are more behaved and under control with the use of ICT.	1.49	Beginning
9	The use of ICT enables students to express their ideas and thoughts better.	2.49	Developing
10	The use of ICT promotes active and engaging lesson for students' best learning experience	1.52	Developing
Total		2.28	Developing

Note. $n=33$ Legend: Note: $n=33$ Expert 3.50 – 4.00; Experienced 2.50 – 3.49; Developing 1.50 – 2.49; Beginning 1.00 – 1.49

The data showed that teachers held a generally developing attitude towards the integration of ICT in the classroom. This meant that the SpEd teachers recognize the advantage of enhancing students'

confidence, learning effectiveness and academic class, however, they still limitations in fostering activity, behavior control, and classroom engagement. The results suggested that while there was a growing familiarity and moderate acceptance of ICT tools among teachers, their confidence in its full potential to transform the learning environment remains tentative.

The results implied that teachers acknowledge some positive outcomes of using ICT particularly in enhancing participation and content delivery but despite all these many are skeptical about the broader instructional impact. This reality maybe radiated to the limited training and while there are available training and the teacher were able to attend and acquire knowledge but there is lack of exposure to effective models of ICT integration. Additionally, some of the teachers need motivation and had insufficient confidence in using technology to support creative, collaborative, and behaviorally sound learning. Hence, these teachers needed comprehensive support and ongoing professional development when it comes to the ICT use in the classroom. Based on interview, these areas remain surface – level where they are unable to maximize its potential applicable in the 21st century learning.

It is recommended then that the schools must create an opportunity for continuum on pedagogically focused ICT training for teachers. The training should be beyond the technical skills to include lesson design strategies that promote engagement, creativity, and positive classroom behavior through ICT tools (Pekto et al., 2021). The experts suggested that when teachers perceived ICT as both manageable and meaningful in their instructional context, their willingness ad effectiveness in using it significantly improve. The schools are therefore reminded that investing in professional development which focuses on pedagogical goals and needs based are effective and efficient.

Significant Difference in the Respondents' Extent of Perceived ICT Integration Across Demographic Profiles

Table 7

Significant Difference on the Respondent's Perceived of ICT Competency

Variable	X²	p-value	Cramer's V	Decision	Remarks
Perceived ICT Competency in terms of Skills					
Age	2.97	0.067	0.342	Accept H ₀	Not Significant
Gender	1.072	0.355	0.181	Accept H ₀	Not Significant
Length of Service	1.69	0.202	2.87	Accept H ₀	Not Significant
Highest Educational Attainment	1.69	0.202	0.285	Accept H ₀	Not Significant
ICT Trainings Attended	1.345	0.229	0.356	Accept H ₀	Not Significant
Number of Hours of Relevant ICT Trainings Attended	1.472	0.243	0.215	Accept H ₀	Not Significant
Number of ICT Functional Technology	1.892	0.177	0.289	Accept H ₀	Not Significant
Perceived ICT Competency in terms of Knowledge					
Age	6.59	0.037	0.510	Reject H ₀	Significant
Gender	0.696	0.506	0.146	Accept H ₀	Not Significant
Length of Service	1.83	0.178	0.296	Accept H ₀	Not Significant
Highest Educational Attainment	1.83	0.178	0.291	Accept H ₀	Not Significant
ICT Trainings Attended	1.609	0.203	0.368	Accept H ₀	Not Significant
Number of Hours of Relevant ICT Trainings Attended	1.598	0.218	0.222	Accept H ₀	Not Significant
Number of ICT Functional Technology	1.684	0.216	0.273	Accept H ₀	Not Significant
Perceived ICT Competency in terms of Performance					
Age	0.434	0.652	0.116	Accept H ₀	Not Significant
Gender	0.68	0.514	0.144	Accept H ₀	Not Significant

Length of Service	1.11	0.341	0.183	Accept H_0	Not Significant
Highest Educational Attainment	1.114	0.341	0.231	Accept H_0	Not Significant
ICT Trainings Attended	1.345	0.229	0.356	Accept H_0	Not Significant
Number of Hours of Relevant ICT Trainings Attended	0.997	0.384	0.174	Accept H_0	Not Significant
Number of ICT Functional Technology	1.217	0.312	0.246	Accept H_0	Not Significant
Respondent's Perception and Attitude towards ICT Integration					
Age	31.53	0.000	1.000	Reject H_0	Significant
Gender	1.46	0.481	0.210	Accept H_0	Not Significant
Length of Service	2.81	0.591	0.224	Accept H_0	Not Significant
Highest Educational Attainment	2.216	0.094	0.041	Accept H_0	Not Significant
ICT Trainings Attended	1.89	0.171	0.213	Accept H_0	Not Significant
Number of Hours of Relevant ICT Trainings Attended	1.121	0.346	0.219	Accept H_0	Not Significant
Number of ICT Functional Technology	0.974	0.412	0.201	Accept H_0	Not Significant

Significant at $p < 0.05$ (two-tailed)

Perceived ICT Competency in Terms of Skills

The findings pointed out that there was no significant difference in the SpEd teacher's perceived ICT competency in terms of skills when grouped according to their demographics profiles such as age, gender, length of teaching service, highest educational attainment, ICT trainings attended, number of hours of relevant ICT trainings, and number of ICT functional technology. All p-values for these demographic variables were greater than 0.05 which clearly manifested that we accept the null hypothesis and concluded that these factors did not significantly influence how teachers perceived their ICT skills.

The results indicated that regardless of differences in background, training exposure, or access to ICT tools, the teachers in the study had relatively similar self-assessed skill levels in using ICT for educational purposes.

It was then recommended that the proposed output of the study should be dynamic and aligned with the capacity – building strategies intended to enhance the ideal ICT practices instead of fitting in such based on the demographic distinctions. Since no significant differences were observed from the demographic profile based on findings, the professional development for the SdEd teachers regardless of background prioritize practical application on pedagogical use of ICT. Claro et al. (2021) suggested that achievable ICT integration can be successfully deployed if a tailored sustainable professional learning be observed throughout the academic community in the delivery of instruction.

Perceived ICT Competency in Terms of Knowledge

From the results, the demographic profile was the only factor which got a statistically significant difference in the respondents' perceived ICT Competency in terms of knowledge. This indicated that age had a significant influence of the teachers' self-assessed knowledge in integrating ICT. It was noted that younger teachers were more familiar and comfortable with ICT might be because with generational exposure, while veteran teachers might have a more traditional approach to teaching and technology use. In contrast, other components such as the gender, length of service, educational attainment, and all ICT training – related factors did not show significant differences, suggesting that notwithstanding of these variables, the teachers perceived their knowledge level in ICT integration similarly.

It was suggested that school leaders must create varying ICT training programs that was fitted with the learning styles of various generations that significantly affect how the respondents view their ICT knowledge. Younger teachers may benefit from innovative modules, while more experienced teachers might need basic support to help them feel more confident and skilled in using ICT. According to Almazan et al. (2021) focused, innovative and age-

sensitive digital training-workshop must improve SpEd teacher engagement and increases the effectiveness of ICT-based instruction.

Perceived ICT Competency in Terms of Performance

The analysis showed that there was no significant difference across all demographic profiles in terms of performance. Based on results all factors did not affect significantly on how the teachers rated their performance in integrating ICT in the class delivery. This suggested that the respondents generally had similar levels of perceived competences in using ICT tools and strategies regardless of their age, gender, years of experience, educational attainment or trainings attended as well as the availability of ICT functional technologies. This reflected a consistent level of ICT use among the teachers in both Zapatera and Lahug NHS were likely influenced by shared guidelines and expectations from the education system.

Since there was a consistent performance across demographics which suggested that shared standards and institutional practices favorable influence ICT integration, it was recommended that system-wide ICT policies and support mechanisms must be strengthened and sustained. This shall help a continued reinforcement of a unified guideline.

Perception and Attitude Towards ICT Integration

The results gleaned that the SpEd teachers' views and attituded towards ICT integration showed a significant difference. These findings indicated that age played a key role in how teachers perceived and reacted to the use of ICT in the classroom. The younger teachers had a more open and positive attitude due to familiarity with digital tools, whereas older teachers were less excited about ICT integration. Nevertheless, there was no significant differences were found from among the demographics. This suggested that while those factors do not heavily influence attitudes, age was still an important factor on how ICT was accepted and viewed in the teaching and learning process anent to students with special needs.

It was recommended that school heads must introduce an age-responsive orientation and mentoring programs that welcomes positive attitudes toward ICT integration. This was applicable and favorable for the veteran SpEd teachers. The promotion of peer learning and by offering a practical support can help close the generational gaps in ICT acceptance and create an inclusive digital teaching – learning environment.

CONCLUSION

The study revealed that the SpEd teachers perceived skills were mainly influenced by their age although they considered themselves as experienced ICT integration. Younger teachers exhibited advanced knowledge, confidence, and willingness to use ICT tools. This trend was likely due to their generational exposure. The rest of the demographic factors such as gender, years of service, education level, ICT training, and access to tools, did not significantly affect their skills, knowledge, performance, or attitudes.

The consistency of the self-assessed performance and skill levels among the SpEd teachers from both Zapatera NHS and Lahug NHS showed a common expectation for ICT use. However, specific gaps were identified in areas like organizing digital files and creating technology-mediated learning activities. This suggested a need for targeted, practical, and teaching-focused professional development.

Additionally, although teachers perceived a generally viewed ICT integration positively their understanding for a transformative potential in special education was still limited. This might be because these teachers had a little exposure for effective ICT models and lacked targeted, needs-based training.

These findings implied that future ICT interventions must be dynamic in nature and should be generationally responsive. A strengthened system-wide support mechanisms, enhanced age-sensitive and skill-specific training as well as networked professional development with both instructional content and teacher beliefs should help SpEd educators move from basic to improved ICT integration. The researcher believed that through focusing in these areas will lead the teachers in creating an inclusive, engaging, and effective digital learning environments aligned with the diverse needs of students with special educational needs.

To address these challenges, the Program Design draws on the Technology Acceptance Model (TAM) and the Teachers' Professional Development Framework on ICT. The study partially supports TAM, highlighting the need to improve perceived ease and usefulness of ICT. It strongly supports the Professional Development Framework, calling for age-sensitive, skill-based, and practice-oriented training that integrates pedagogy, assistive technology, and inclusive design.

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