The Information Technology Resilience of Bachelor of Elementary Education Students

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ABSTRACT

The primary aim of this study was to evaluate the level of Information Technology (IT) Resilience of Eastern Visayas State University, Ormoc City Campus Bachelor of Elementary Education students. This study addressed the lack of local studies on the ability of these students to adapt to flexible learning formats under the situation of the COVID-19 pandemic condition, the problems they faced, the approaches they employed, and the institution's need to ready itself for the future challenges. Purposive random sampling was applied in collecting data from second- and third-year respondents of the Bachelor of Elementary Education (BEED) course. The original pilot test of 31 respondents was preceded by a representative sample size of 124 students. A survey questionnaire was administered to determine the demographic profile of the respondents and to measure the level of their resilience in terms of access to technology and basic digital literacy through 10 indicators for each factor. The data collected were processed using frequency tables for demographic profiles, weighted mean calculation for access to technology and resilience indicators, and correlation coefficient analysis to identify the interdependencies of demographic variables and the level of resilience. The study indicated a high correlation between demographic variables such as age, sex, year level, and marital status, and the level of resilience of the students in terms of access to technology and basic digital literacy. Students with improved access to technology and stronger digital literacy capabilities showed high resilience in adapting to flexible learning environments. This study highlighted the importance of equipping students with fundamental digital skills and technology access to enable their information technology resilience. The results are beneficial for guiding the development of targeted strategies that promote differential access to digital resources and build students' preparedness for possible future educational interruptions. The results can serve as a basis for institutional policy development and program design for promoting student success in digital learning environments.

Keywords— Access to Technology, Basic Digital Literacy, Elementary Education Students, Information Technology Resiliency

INTRODUCTION

The COVID-19 pandemic brought severe disruptions in learning globally, later requiring an abrupt transition from traditional face-to-face pedagogy to online and blended modes. Although the process smoothed the operations in learning, it also demonstrated gaps in technological readiness, particularly among learners with either no access to the required technology or minimal experiences with digital competence. Research has extensively documented the challenges of the learners, ranging from technological limitations, demotivation, to the difficulty of re-adjusting into the new digital learning spaces (Jandrić et al., 2020; Hodges et al., 2020). Despite the growing universal dialogue on integrating technology into systems of learning, there is the extensive gap in the aspect of understanding learners—particularly learners in teacher education programs— practicing Information Technology (IT) resilience over such challenges. This research aims to fill this gap with

a question on the IT resilience of Bachelor of Elementary Education (BEED) students, although trained to teach others, had not necessarily been prepared for learning situations based on technology.

Internationally, the rapid transition to online learning emphasized existing disparities in education access. Most students used multiple adaptive strategies, such as digital tools, self-directed learning, virtual peer support, and social media collaboration (Hao et al., 2020). Additionally, some students used adaptive technologies to enhance their learning experience (Bozkurt et al., 2020). Some students used digital tools to use databases for research; for example, the use of Lens.org in conducting scientific research on patent landscape analysis on nanotechnology-based drug delivery systems (Gudelos, 2025a). However, studies have confirmed that prolonged school closures had a disproportionate effect on disadvantaged groups, especially those with limited access to digital devices and reliable internet connections (Viner et al., 2020; Van Lancker & Parolin, 2020). Thus, the digital divide exacerbated existing learning disparities, and it is hence crucial to examine how students from different backgrounds adapted to these issues.

In the Philippines, students also experienced the same difficulties in adjusting to online learning. Limited access to technology facilities, poor digital literacy, language barriers, and distractions at home settings became primary barriers (Gozum & Abia, 2021). Unreliability of internet connections and computer access directly affected low-income students, thus further widening the gap in education (UNESCO, 2020). Despite the challenges, the Commission on Higher Education (CHED) promoted the continuation of flexible learning, as indicated in CHED Memorandum Order No. 06, Series of 2022, to sustain flexible learning models in higher education (Education, 2022). Among the most negatively impacted were BEED students, who had already acquired conventional face-to-face pedagogy but now needed to adjust to computer-based teaching and learning settings.

Past studies have extensively examined the impacts of the pandemic on the education sector, namely on learning outcomes, psychological aspects, and technological concerns. Most past studies, however, relied heavily on general surveys or qualitative methods with no specific emphasis on the IT resilience exhibited by education students. Most studies were on the general aspects of online learning and did not examine how future teachers, who are required to integrate technology into their pedagogy, became resilient in the online learning environment. Further, studies conducted within the Philippine context were more concerned with technological constraints while neglecting to examine properly adaptive measures and resilience mechanisms used by students. There is therefore an urgent need to know more about how BEED students adapted to the digital learning environment amidst the pandemic.

In this context of perceived gaps, the current study aims to ascertain the IT resilience of BEED students at Eastern Visayas State University – Ormoc City Campus. The study is particularly pertinent in that these students were among the last to experience the academic adaptations brought about by the pandemic in the 2021–2022 school year. The application of ICT competencies to enhance the quality and sustainability of education is required of students under CHED Memorandum Order No. 74, Series of 2017. Their actual situation, however, as to whether they were ready and had the resilience to use IT for learning purposes remains doubtful.

This study is aimed at supplementing the existing body of knowledge by providing empirical evidence related to the IT resilience of BEED students. Results derived therefrom will serve as a springboard for crafting institutional policies and training programs whose primary aim will be to prepare students and teachers better for future eventual disruptions in the learning environment. Results will also serve as an invaluable source of advice to decision-makers, i.e., administrators who craft policies, so that teachers in the future are well-prepared with the right digital competences to thrive in an ever-evolving learning environment. Finally, the current study emphasizes education students' resilience during a world crisis and offers practical suggestions to boost digital preparedness in teacher education programs.

Research Objectives

This study aimed to determine the Information Technology Resilience of Bachelor of Elementary Education students at Eastern Visayas State University, Ormoc Campus. Specifically, it sought to examine the

demographic profile of the respondents in terms of age, sex, year level, and marital status. It also aimed to assess their level of Information Technology resilience based on access to technology and basic digital literacy. Furthermore, the study investigated whether there was a statistical correlation between the respondents' demographic profile and their resilience level. Lastly, it aimed to propose recommendations to improve or maintain IT resilience, considering the demographic characteristics of the respondents.

LITERATURE AND RELATED STUDIES REVIEW

Information Technology Resilience

Resiliency is a sound investment in daily life. In the information technology domain, the phenomenon of students' resiliency came as a norm after the pandemic. Before the pandemic, all students faced tough times at some point in their social and academic life. Resilience is the ability to deal very well when challenged by adversity or pressure, hence avoiding students' potential negative psychological impacts. It is not simply endurance in adversity: resilient students see academic or social failure as an opportunity to learn. It may mean stepping up efforts, embracing innovative approaches, or learning conflict resolution skills. Resilience is the power of a person to recover from adversity, navigate through or around adversity, and thrive in the face of new adversity. In the school setting, resilience is a decisive factor that impacts students' ability to attain academic success using digital technologies (Howley-Rouse, 2023; Richardson, 2002).

Nowadays, in an increasingly digital society, technologies play a crucial role in most areas of life, including education. Facebook for example can be used to supplement teaching and learning (Gudelos, 2023a). Technologies are crucial to implement a time-tested pedagogical approach such as inquiry-based learning (Gudelos, 2023b). These technologies could further lighten workloads, and stress, relatively contributing to teaching and learning performance, as Gudelos and Mabitad (2025b) mentioned the interplay of workplace stress, workloads and performance in the academe. Moreover, students face many risks and threats in their digital interactions. Digital resilience is essential to enable individuals to identify and deal with threats and dangers while socializing, discovering, or conducting work in digital spaces. Digital resilience is at the heart of being able to cope with the digital world. University students, particularly elementary education students, increasingly use information technology for study, communication, and academic work (Prensky, 2001). Their capacity to move through digital spaces, accommodate new technology, and hurdle obstacles to accessing and utilizing digital resources is vital to academic achievement (Brown & Czerniewicz, 2010). However, the issue of digital resilience in education has not been widely researched (Sun et al., 2022). Even though technology has many advantages in education, students are exposed to various obstacles that affect their Information Technology resilience, such as varying digital literacy skills, technical problems, digital resource-related problems, distractions, and the information overloading phenomenon (Bennett et al., 2008; Selwyn, 2016).

To improve the resilience of Information Technology among university students, new strategies must be implemented taking into account individual and systemic factors. These strategies can involve ensuring access to technological facilities and digital tools on an equal basis, including digital literacy in academic curricula, providing technical support services, and implementing pedagogical strategies that encourage active engagement and critical thinking in the digital environment (Wang et al., 2008; War Schauer & Muchnik, 2010).

Though there is an extensive literature base on digital literacy and technology use in schools, there is minimal research on information technology resilience. Most of the available research focuses on widespread digital literacy and access to technology, but they do not critically examine the relationship between digital resilience, flexibility among students, and academic performance. In addition, existing research does not fully capture the specific challenges of university students in education programs, especially in developing countries plagued by poor technological infrastructure. Methodologically, existing research has largely drawn on qualitative research or self-report surveys, which may not reflect objective measures of students' resilience. This research aims to address this limitation using a more sophisticated methodological framework that incorporates quantifiable measures of technological access, digital literacy levels, and resilience, thus allowing for a more nuanced understanding of Information Technology resilience among university students.

This research study primarily examines the digital resilience of Bachelor of Elementary Education students in Information Technology at Eastern Visayas State University, Ormoc City Campus. With the intrinsic importance of digital literacy and access to technology in contemporary education, it is critical to study how these aspiring teachers deal with and overcome technology problems. With the measurement of their degree of digital resilience, this study contributes pertinent insights to the larger education technology discourse, thereby empowering institutions with data that could influence policy-making, teaching practices, and support systems. The results of this study will inform targeted interventions that improve IT resilience, whereby education students are well equipped to successfully navigate digital learning environments in their future teaching profession.

Access to technology

Access to technology is central to the promotion of resilience in Information Technology among students. Studies have shown that access to devices by students, such as personal computers, laptops, smartphones, and the internet, has a significant impact on their performance and participation in learning activities (Barron & Gomez, 2008; Kay, 2006). Poor technological access can reduce the ability of students to accomplish assignments, access learning materials, and participate in online learning, and thus create inequalities in learning outcomes (Warschauer, 2006). Moreover, the digital divide, which represents inequalities in technology access based on socioeconomic status, geographic location, and demographic characteristics, exacerbates the inequalities in learning opportunities (DiMaggio & Hargittai, 2001).

Evidence indicates that access to technology has a significant effect on the learning experience of students. Students with home access to computers and the internet achieve better academic performance, are more engaged in learning activities, and demonstrate higher critical thinking and problem-solving capabilities (Becker, 2000; Cuban, 2001). Furthermore, digital technology fosters individualized learning experiences, supports collaborative learning interactions, and enhances students' access to learning resources and information (Means et al., 2013). Providing equal access to technology is thus critical to enhancing students' ability to succeed in digital learning environments and enhancing their Information Technology resilience.

Several policies, institutional, and community efforts have been made to bridge gaps in access to technology. These include provision of internet services at no cost or at subsidized rates, laptops or tablets for students, and technology training programs for students and teachers (McNicol, 2016). Moreover, incorporation of digital literacy classes into curriculum studies and explicit promotion of the utilization of digital technology may ease students' technology adaptability (Eynon & Malmberg, 2011; Warschauer & Matuchniak, 2010). By bridging these technology access gaps, all students, regardless of their background, can be provided with an equal opportunity within digital learning platforms.

Digital learning materials, such as online textbooks, educational websites, multimedia, learning management systems (LMS), virtual labs, simulations, and interactive software programs, are a fundamental component of contemporary education (Means et al., 2013). Access to high-quality digital learning materials has the potential to enhance student motivation, enable personalized learning experiences, and enhance academic performance (Van Rooij et al., 2017; Wu et al., 2019). Nevertheless, issues such as limited access to digital materials, insufficient training on the use of online platforms, and online content quality issues constrain the effective use of these tools in educational settings (Hew & Cheung, 2014; Picciano, 2017). To address these problems, educational institutions must implement measures that include the use of digital pedagogical methods, the promotion of student engagement, and the provision of training and support for faculty to utilize digital learning materials effectively (Bates, 2015; Laurillard, 2008). In addition, cooperation among educators can significantly increase the diversity and quality of digital learning materials accessible to students (Wiley & Hilton, 2018).

Notwithstanding the large body of literature on digital literacy and access to technology, little research has been specifically conducted on the extent of Information Technology resilience among university students, particularly teacher education students. Available studies primarily concentrate on general digital literacy or access to technology without exploring in detail how these elements interact to determine students' resilience in digital learning environments. Most of the available studies also disregard the special problems of students

in education programs, particularly in developing countries where technological infrastructure and institutional support may be lacking.

This study aims to bridge the current gap by examining the Information Technology resilience of Eastern Visayas State University – Ormoc Campus Bachelor of Elementary Education students, specifically in two critical dimensions: Access to Technology and Basic Digital Literacy. In contrast to previous studies, which provide a general assessment of digital adaptation, this study examines the degree to which the students' access to technology facilities and digital literacy capabilities increases their capacity to adapt and survive in digital learning environments.

Methodologically, previous studies utilized mostly qualitative approaches or self-reported questionnaires, which may not provide a holistic and objective assessment of students' resilience. This study takes a more systematic approach by utilizing measurable indicators of technology access and digital literacy ability to determine the resilience of students in coping with digital learning challenges. The results will provide evidence-based recommendations on how institutions can prepare for future disruption, improve digital access, and implement targeted interventions to build digital literacy skills.

Focusing on the degree of resilience of Elementary Education students, this study enhances the knowledge of the technological and educational challenges faced by future teachers. The findings of the study can be utilized as a policy guide for the formulation of policies, institutional readiness, and curriculum development for the provision of equal access to technology and digital literacy training, hence building a more resilient and adaptive learning environment.

Basic Digital Literacy

Basic digital literacy is the ability to effectively utilize digital technologies in an effort to access, evaluate, create, and communicate information (Martin, 2006). In the process of learning in the digital environment, these skills are needed by students in an attempt to navigate online spaces, engage with digital materials, and conduct scholarly research (Bawane & Spector, 2009). Digital literacy involves a broad range of competencies, ranging from technical skills, critical evaluation of digital materials, and ethical aspects of digital engagement (Martin, 2008). Empirical evidence shows that students who exhibit high degrees of digital literacy have higher confidence in using technology in scholarly activities, such as research work, collaborative learning activities, and multimedia content production (Fraillon et al., 2014; Hatlevik & Christophersen, 2013).

In addition, digital literacy is essential for the success of students in online and blended learning environments. Digital tool literacy enables students to critically evaluate online resources, avoid plagiarism, and uphold ethical standards in digital research activities (Lankshear & Knobel, 2008). With the growing reliance on digital platforms in the learning context, basic digital literacy competencies are now a necessity for successful academic engagement and knowledge acquisition (Hatlevik & Christophersen, 2013; Fraillon et al., 2014).

Yet, studies also show great differences in digital literacy abilities among students, by age, gender, socioeconomic status, and past experience with technology (Selwyn, 2009). Most students lack the ability to construct and sustain minimum digital skills due to limited technology access, poor formal training, and institutional absence of support in gaining digital skills (Livingstone & Helsper, 2007; Hargittai & Hinnant, 2008). These differences in digital literacy pose difficulties in students' ability to learn in digital learning environments, and by extension, on their overall Information Technology resilience.

To bridge these differences, several strategies have been employed to develop digital literacy in university students. Educational institutions and policymakers have attempted to incorporate digital literacy into the curriculum, increase access to digital tools, and implement targeted training programs for staff and students (Livingstone, 2012; Margaryan et al., 2011). Pedagogical practices focusing on active learning, collaboration, and problem-solving in digital environments have been identified as effective methods for developing digital literacy and resilience (Bawane & Spector, 2010).

As research on digital literacy continues to increase, few studies investigate specifically how minimum digital

literacy influences Information Technology resilience in university students, especially those undertaking teacher education. Studies that exist address mainly general digital literacy or access to technology but do not address explicitly how these factors interact to increase students' ability to adapt and be technologically resilient in learning environments. Moreover, studies that exist pay little attention to the specific challenges of education students who are tasked with not only constructing their own digital skills but also constructing the ability to integrate technology into teaching.

From a methodological point of view, current literature has primarily employed qualitative methods or self-reported surveys, which may not be capable of capturing the entire range of students' digital resilience. The current study tries to fill this gap by employing a stricter procedure that applies quantitative measures of technology access and digital literacy competencies to measure resilience in Information Technology.

The current study targets Bachelor of Elementary Education students at Eastern Visayas State University – Ormoc Campus with the goal of gaining insights into the roles of technology access and critical digital literacy competencies in enabling students' ability to acclimate in digital learning environments and solve technological issues. The results of this research will be used as a basis for institutional policy and strategy to improve digital preparedness, ensure fair access to technology, and enhance training programs aimed at digital literacy. Overall, the current research contributes to the creation of a more resilient and adaptive learning environment for prospective teachers, ensuring that they have the required skills, which will enable them to effectively integrate technology into both their studies and professional practice.

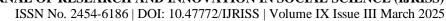# METHODS

A. Research Design

This study employed a quantitative design to examine the correlation between participants' demographic profile and Information Technology resilience. Descriptive-correlational research was actually employed, with the research focusing on correlation analysis between respondents' composite profile and corresponding Information Technology resilience levels. Although a single primary major variable—Information Technology resilience—was statistically analyzed, the employment of demographic information as a composite profile allowed for an integrated examination of resilience-influencing factors in digital learning environments.

The study first employed a descriptive random sampling strategy; however, in a bid to further develop the focus and application of the study, purposive sampling was employed. As a non-probability sampling approach, the strategy allowed the researchers to target specifically the students of the Bachelor of Elementary Education course, thus ensuring that the sample was a correct representation of the study population. The employment of purposive sampling was motivated by the hypothesis that sampling the participants with respective experiences and exposures to digital learning environments would provide richer and more meaningful data (Etikan, Musa, & Alkassim, 2016). Employing researcher discretion in selecting the participants, the research method ensured maximum efficiency in the data-gathering process while increasing the study results' relevance.

Data collection was conducted using a survey research design, i.e., a Likert-scale questionnaire to measure the respondents' Information Technology resilience. The survey questions were designed to identify the most significant indicators of digital resilience, and the data collected were analyzed in conjunction with demographic variables to determine potential correlations. The research design allowed for a thorough exploration of the influence of demographic variables on Information Technology resilience of Bachelor of Elementary Education students.

B. Participants and Sampling Method

The subjects of this study were second-year and third-year Bachelor of Elementary Education (BEED) students of Eastern Visayas State University – Ormoc City Campus. The sample was determined using Slovin's Formula, 95% confidence, 5% margin of error, and 50% population proportion.

Second-year and third-year BEED students, by the official registrar records of the university, made up the population of 180. Applying Slovin's Formula, at least 124 respondents were determined in order to obtain a 95% chance of the study outcome actually representing the true population parameter within a margin of ±5%. This derived sample size ensured statistically sound inferences regarding Information Technology resilience among the BEED students.

C. Research Procedure and Instruments

The research study employed the survey questionnaire tool, which the researchers designed to be the instrument of data gathering. The tool went through validation done by the professional experts that helped determine the content validity as well as reliability of the questionnaire. Additionally, the researchers administered the instrument as a pilot survey to 30 respondents who did not belong to the final research sample to ensure the instrument has clarity, is consistent, as well as functional. The research instrument format came in the survey questionnaire format whose core variables came from the center of the research, which consisted of the Information Technology resilience level and the demographic profile. Demographic information gathered in the first part of the research instrument involved age groups (17–20 years, 21–24 years, 25–28 years, and 29–33 years), gender (either male or female), academic status (second-year or third-year students, as relevant to learning experience in the context of COVID-19-induced flexible learning), and marital status (single, married, widowed, and divorced/separated). The measurement of the level of resilience used the second section of the research instrument in a 4-point Likert Scale, where there were 10-item indicators specific to each of the two components—Access to Technology and Basic Digital Literacy—to measure as well as identify the level of Information Technology resilience of the learners.

D. Data Gathering Procedure

The researcher constructed a questionnaire aligned with the objectives of this study. The survey questionnaire focused on Information Technology resilience, including students' technological skills, confidence in using IT tools, access to technology resources, and experiences with IT challenges and setbacks. The surveys were administered face-to-face during students' break times to ensure convenience and maximize participation. Purposive sampling was employed to select participants representing diverse backgrounds, experiences, and perspectives among Bachelor of Elementary Education students. Participants were recruited through departmental announcements, class invitations, and personal referrals. Clear instructions and reminders were provided to encourage participation, and responses were collected anonymously over a specified period.

E. Ethical Issues and Considerations

The research only started after being cleared by the campus director and reviewed by competent experts to ensure the research process quality and integrity. To ensure the respondents' rights and well-being, the researchers secured informed consent from all respondents prior to data collection, ensuring that they were properly educated about the purpose of the study, procedures, and voluntary participation.

The research complied with Republic Act No. 10173, or the Data Privacy Act of 2012 (DPA), in protecting the participants' personal information and data privacy. Anonymous identifiers were utilized to conceal the participants' identities in survey answers, focus group discussion transcripts, and research reports. Access to all the data gathered was likewise limited only to authorized members of the research team. The researchers likewise ensured respect for the cultural beliefs, values, and views of the participants during the research.

F. Data Analysis

The data collected in the present study were analyzed based on a series of statistical analyses that were suitable for the aims of the study. As a descriptive correlational study, an array of statistical treatments was adopted to interpret the results appropriately.

The demographic profile of the respondents was examined through frequency and percentage distribution, providing a proportionate representation of the sample size. This treatment ensured appropriate representation

of the demographic profile of the respondents.

In evaluating the Level of Information Technology Resilience, a weighted mean was employed. The indicators—Access to Technology and Basic Digital Literacy—were assessed based on this strategy, enabling relative importance of each factor to be taken into account when determining the overall level of resilience. This strategy ensured the more influential indicators were proportionately represented in the overall mean, thereby enhancing understanding of Information Technology resilience among students.

The relationship between the demographic profile and Level of Information Technology Resilience was examined using corresponding correlation approaches. Specifically, Spearman's Rho was employed to examine the relationship between age, year level, and IT resilience, while Point Biserial Correlation was employed to examine sex and marital status.

The data were examined based on a 4-point Likert scale, as per a stipulated criterion specified in Table 1 to enable proper and uniform evaluation of responses.

Table 1. 4-point Likert Scale Questionnaire

Likert-Scale Description	Likert Scale	Scale Range
Strongly Disagree	1	1.00-1.75
Disagree	2	1.76-2.50
Agree	3	2.51-3.25
Strongly Agree	4	3.26-4.00

 G. Scope and Limitations of Research

This study focused on the Information Technology Resilience of Bachelor of Elementary Education (BEED) students at Eastern Visayas State University – Ormoc City Campus. Given the study's timeframe and availability of respondents, the participants were limited to second-year and third-year BEED students. These students were specifically chosen as they were among the last cohorts to experience the pandemic-era online and blended learning modalities during the academic year 2021–2022. Their experiences provided valuable insights into the challenges and adaptations associated with digital learning during this period.

The respondents were randomly selected from the second-year and third-year BEED students at Eastern Visayas State University – Ormoc City Campus. A simple random sampling method was employed, ensuring that each student had an equal chance of being selected (Thomas, 2023). Data collection involved direct physical interaction, where survey forms were distributed to each respondent.

This study was limited by its reliance on a descriptive survey method, which, while effective for measuring Information Technology Resilience, did not allow for in-depth qualitative exploration. The absence of qualitative interviews restricted the ability to capture comprehensive personal narratives and contextual insights related to the students' digital resilience. Additionally, since the study focused on a single institution, the findings may not be fully generalizable to a broader population. Future research could expand the scope by including multiple schools to provide a more robust and comparative analysis, thereby strengthening the conclusions on Information Technology Resilience in the context of elementary education students.

RESULTS

Demographic Profile of the Respondents

Table 2 gives a vivid account of the demographic composition of the respondents to the survey. In defining the age composition, it is reported that the largest percentage among the respondents, which is 65%, is in the age group of 21-24 years. This is followed by the respondents aged 17-20, who comprise 32% of the respondents. Additionally, a minority of the respondents, which is 2% and 1% respectively, are in the age groups of 29-33

and 25-28 years. The gender distribution indicates that the majority, which is 87%, are female, while the remaining 13% are male. The statistics indicate that 58% of the respondents are in their third year of study, as compared to 42% who are in their second year of study. In defining marital status, it is reported that an overwhelming majority, which is 97% of the respondents, are single. Compared to this, a minority, which is 3%, is described as married.

Table 2. Demographic Profile of the Respondents

Demographic Profile		
Age	**Frequency**	**Percentage**
17-20	40	32%
21-24	81	65%
25-28	1	1%
29-33	2	2%
Total	124	100%
Sex		
Male	16	13%
Female	108	87%
Total	124	100%
Year Level		
2nd Year	52	42%
3rd Year	72	58%
Total	124	100%
Marital Status		
Single	120	97%
Married	4	3%
Total	124	100%

Level of Resilience in Access to Technology

The table 3.1 represent the level of resilience in terms of the access of technology indicators wherein the weighted mean is computed through the responses of the respondents. The highest weighted mean is from indicator number 1 wherein the respondents consistently use technology devices at home for academic purposes with 3.37 average, followed by while the lowest among the indicators is from indicator number 9 where the respondents have access to desktop computer for academic learning with an average of 2.79 mean. The overall weighted mean for the access of technology is 3.11 with high indicator of the respondent's self-assessment of their access to technology.

Table 3.1. Level of Resilience of the Respondents in terms of Access to Technology

Access to Technology			
Indicators	**Weighted Mean**	**Description**	**Interpretation**
1. I consistently use technology devices at home for academic tasks	3.37	Strongly Agree	Very High
2. I maintain frequent Internet access at home for academic learning	3.20	Agree	High
3. I ensure adequate devices at home for academic use	3.24	Agree	High
4. I use internet access family for academic purpose	3.10	Agree	High
5. I have W-Fi at home for academic utilization	2.85	Agree	High
6. I actively overcome barriers to technology access hindering academic learning	3.03	Agree	High
7. I persisted in overcoming obstacle to accessing academic technology	3.09	Agree	High
8. I persisted to find solutions to support academic technology needs	3.20	Agree	High
9. I have access to a desktop computer for academic learning.	2.76	Agree	High
10. I have smartphones available for educational utilization	3.23	Agree	High
Total	**3.11**	**Agree**	**High**

Level of Resilience in Basic Digital Literacy

The table 3.2 shows the level of resilience in terms of the basic digital literacy indicators wherein the weighted mean is computed through the responses of the respondents. The highest weighted mean is from indicator number 5 wherein the respondents strongly agree on adopting crafting learning outputs using PowerPoint presentation with 3.28 average and exhibit resilience in the proficiency with Google Meet effectively with 3.25 average while the lowest among the indicators is the indicator number 7 where the respondents are confident in navigating online platforms for academic discussions with 2.98 mean. The overall weighted mean for the access of technology is 3.13 with high indicator of the respondent's self-assessment of their basic digital literacy.

Table 3.2. Level of Resilience of the Respondents in terms of Basic Digital Literacy

Basic Digital Literacy			
Indicators	Weighted Mean	Description	Interpretation
1. I exhibit resilience in my proficiency with Google Meet effectively	3.25	Strongly Agree	Very High
2. I am adaptive in navigating academic discussion in google classroom	3.10	Agree	High
3. I display resilience in my proficiency in submitting academic outputs through Google Meet Classroom.	3.15	Agree	High
4. I seek digital literacy skills training to be move adaptive in technology	3.01	Agree	High
5. I am adopting crafting learning outputs using PowerPoint presentation	3.28	Strongly Agree	Very High
6. I have shown resilience in adjusting to the digital learning setup	3.13	Agree	High
7. I am confident in navigating online platforms for academic discussions	2.98	Agree	High
8. I encountered challenges in navigating online databases but persistently overcome the Obstacles	3.21	Agree	High
9. I actively seek opportunities to improve my information technology literacy skills	3.17	Agree	High
10. I feel comfortable in critically assessing the credibility of online information	3.07	Agree	High
Total	**3.13**	**Agree**	**High**

Correlation Between Age and Access to Technology

The relationship between age and technology access is provided in table 4.1. Spearman's rho correlation coefficient is -0.648, which is a moderately strong negative relationship. It indicates that access to technology is less with increasing age. Sig. 2-tailed is 0.000, which is less than 0.05. It indicates that the relationship is significant at the 0.05 level. Thus, we can say that there is significant correlation between age and technology access.

Table 4.1. Correlation of Age to Access to Technology

Correlations			ATT	Age
Spearman's rho	ATT	Correlation Coefficient	1.000	-.648**
		Sig. (2-tailed)	.	.000
		N	124	124
	age	Correlation Coefficient	-.648**	1.000
		Sig. (2-tailed)	.000	.
		N	124	124

**. Correlation is significant at the 0.05 level (2-tailed).

Correlation Between Age and Access to Technology

Table 4.2 shows the results of a correlation test between basic digital literacy and age. Spearman's rho correlation coefficient = -0.569, a moderately strong negative correlation. It suggests that as age increases, there is a corresponding decrease in basic digital literacy. Sig. 2-tailed = 0.000, which is below the threshold of 0.05. It thus signifies that the correlation is significant at the 0.05 level. It then follows that the findings imply a significant relationship between basic digital literacy and age.

Table 4.2. Correlation of Age to Basic Digital Literacy

		Correlations		
			age	BDL
Spearman's rho	Age	Correlation Coefficient	1.000	-.569**
		Sig. (2-tailed)	.	.000
		N	124	124
	BDL	Correlation Coefficient	-.569**	1.000
		Sig. (2-tailed)	.000	.
		N	124	124

**. Correlation is significant at the 0.05 level (2-tailed).

Correlation Between Sex and Access to Technology

Table 4.3 also illustrates the point-biserial correlation between Access to Technology and the Sex of the respondents with a coefficient of 0.27. The value is a low positive correlation between the sex variable and the variable for access to technology. Despite the fact that the correlation is not high, it indicates that, on average, female respondents have slightly improved access to technology compared to the male respondents. More specifically, the average score of males in terms of access to technology is 2.83, while the same measure for females is 3.17. Such a difference between the average scores proves the reality of a positive correlation, since it indicates that females have better access to technology. While the correlation is reasonably weak, it is statistically strong enough to identify a clear pattern that females enjoy better access to technology than the males.

Table 4.3. Correlation of Sex to Access to Technology

	Correlations			
		ATT	Male	Female
Access to Technology	Weighted Mean	3.125	2.83	3.17
	Sig. (2-tailed)		.000	.000
	N	124	124	124
	Point-biserial Correlation		0.27	

**. Correlation is significant at the 0.05 level (2-tailed).

Correlation Between Sex and Basic Digital Literacy

Table 4.4 shows a point-biserial correlation coefficient of 0.33, which is a weak positive correlation between sex and the achievement of higher basic digital literacy skills. While the strength of the correlation is weak, it does show that, on average, females have higher basic digital literacy than males. In particular, the average basic digital literacy score for males is 2.775, while for females it is 3.14. This difference in average scores supports the positive correlation, showing a tendency for females to have basic digital literacy skills. While the relative weakness of the correlation does not allow for a strong conclusion, it is still statistically significant enough to show a discernible trend where females show proficiency in basic digital literacy.

Table 4.4. Correlation of Sex to Basic Digital Literacy

	Correlations			
		BDL	Male	Female
Basic Digital Literacy	Weighted Mean	3.14	2.775	3.20
	Sig. (2-tailed)		.000	.000
	N	124	124	124
	Point-Biserial Correlation		0.33	

**. Correlation is significant at the 0.05 level (2-tailed).

Correlation Between Year Level and Access to Technology

Table 4.5 is a correlation between year level and access to technology. Spearman's rho correlation coefficient is -0.402, a low negative correlation. This means that the higher the year level, the access to technology will be lower. The significance level (Sig. 2-tailed) is 0.000, lower than 0.05. This means that the correlation is

statistically significant at the 0.05 level. Therefore, we can conclude that there is a significant correlation between year and access to technology.

Table 4.5. Correlation of Year Level to Access to Technology

		Correlations	ATT	Year Level
Spearman's rho	ATT	Correlation Coefficient	1.000	-.402**
		Sig. (2-tailed)	.	.000
		N	124	124
	Year Level	Correlation Coefficient	-.402**	1.000
		Sig. (2-tailed)	.000	.
		N	124	124

**. Correlation is significant at the 0.05 level (2-tailed).

Correlation Between Year Level and Basic Digital Literacy

Table 4.6 is a correlation between year level and basic digital literacy. The Spearman's rho correlation coefficient is -0.476, indicating a weak negative correlation. The finding is that as the level of the year increases, the basic digital literacy declines. The significance level (Sig. 2-tailed) of 0.000 is lower than the 0.05 level. This, in turn, means that the correlation is statistically significant at the 0.05 level. It can thus be concluded that there is a significant correlation between year level and basic digital literacy.

Table 4.6. Correlation of Year Level to Basic Digital Literacy

		Correlations	BDL	Year level
Spearman's rho	BDL	Correlation Coefficient	1.000	-.476**
		Sig. (2-tailed)	.	.000
		N	124	124
	Year level	Correlation Coefficient	-.476**	1.000
		Sig. (2-tailed)	.000	.
		N	124	124

**. Correlation is significant at the 0.05 level (2-tailed).

Correlation Between Martial Status and Access to Technology

Table 4.7 indicates a point-biserial correlation coefficient of -0.34 to indicate that there is a low negative correlation relationship between marital status and having higher access to technology. Even though the correlation is not high, it indicates that females, on average, have slightly better access to technology than males. The average access to technology score for single is 3.15, while for married it is 2.33. This difference in the averages verifies the positive correlation, which means that females have higher access to technology. Even though the correlation is not high, it is statistically significant enough to indicate a trend where single have higher access to technology married.

Table 4.7. Correlation of Marital Status to Access to Technology

		Correlations	ATT	Single	Married
Access to Technology		Weighted Mean	3.125	3.15	2.33
		Sig. (2-tailed)		.000	.000
		N	124	124	124
		Point-biserial Correlation		-0.34	

**. Correlation is significant at the 0.05 level (2-tailed).

Correlation Between Martial Status and Basic Digital Literacy

Table 4.8 shows the point-biserial correlation of respondents' basic digital literacy and marital status with -0.31 coefficient indicating that there is low negative correlation association between being single and having greater access to technology. Although the correlation is not very strong, it shows that on average, females have slightly

better access to technology than males. The single technology access average score is 3.166, while married is 2.425. This average difference confirms the positive correlation that single have greater to basic digital literacy. Although the correlation is not very strong, it is statistically significant enough to reveal that there is a trend where single have greater basic digital literacy.

Table 4.8. Correlation of Marital Status to Basic Digital Literacy

Correlations		BDL	Single	Married
Basic Digital Literacy	Weighted Mean	3.14	3.166	2.425
	Sig. (2-tailed)		.000	.000
	N	124	124	124
	Point-biserial Correlation		-0.31	

DISCUSSIONS

The rapid development of digital technology has dramatically changed the landscape of learning, requiring IT resilience among students to adapt to the learning environments of today. This research investigates the demographic profile of Eastern Visayas State University Bachelor of Elementary Education students and their correlation with digital literacy and technological access. Analyzing variables of age, gender, year level, and marital status, the research attempts to determine the significance of these factors in the engagement of students with digital tools. Determination of correlations between these variables offers rich information on issues and opportunities experienced by students in adapting to an education system reliant on technology. The discussion includes major findings that can be applied to inform policy and programs of digital inclusion and IT resilience among future teachers.

The demographic profile of Bachelor of Elementary Education students at Eastern Visayas State University offers critical insights into their Information Technology (IT) resilience. The majority of participants in the 21-24 age range form a cohort generally more comfortable with using digital tools, thus making them simpler to resolve technology issues (Lee & Hancock, 2023). With 87% of the respondents female, variations in technology use patterns may occur, potentially influencing their access to and adjustment in digital learning environments (Boh et al., 2023). In addition, the data reveal that the majority of students are in their third year of study, which means prior exposure to technology-based course work that elevates their digital literacy (Hwb, 2020). In addition, the majority of single respondents might have fewer external responsibilities, allowing them to focus more on academic and technological pursuits (ProFuturo, 2023).

Table 3.1 shows that students report having a general high level of access to technology with an overall weighted mean of 3.11, which suggests good interaction with digital resources for academic work. The highest weighted mean of 3.37 suggests high usage of personal devices for academic purposes, thus, increased familiarity with technology resources and improved academic performance (Hwang et al., 2020). Contrary to this is the lower mean of 2.79 concerning access to desktop computers, which suggests a resource gap, which may limit students' ability to achieve certain academic processes effectively (Boh et al., 2023). The disparity calls for education institutions to enhance access to key technology, thus, enable students to adapt to digital learning environments effectively (ProFuturo, 2023).

Students assess their basic digital literacy as high, as shown by an overall weighted mean of 3.13, indicating self-confidence in key technological skills (Table 3.2). Competence in the use of PowerPoint (3.28) and Google Meet (3.25) suggests familiarity with key educational tools widely used (Jannah, Prasojo, & Jerusalem, 2020). However, a slightly low score of 2.98 in conducting online academic discussions suggests a lack of digital communication skills, which are essential for collaborative learning (Hosseini, 2018). The finding underscores the need for teacher development programs to include digital literacy strategies that enhance online participation, thus, ensuring educators' capabilities to effectively utilize technology-inclined instruction techniques (Suwarto et al., 2022).

A statistically significant negative correlation ($\rho = -0.648$, $p < 0.001$) between age and access to technology

shows that older students have more difficulties in accessing digital resources (Table 4.1). This result is in line with previous studies emphasizing the role of age-related cognitive processes and technology attitudes in contributing to accessibility and adoption rates (Weisberger & Yaron, 2024; Davis et al., 2021). The implications for teacher training programs are significant, as limited access may reduce the ability of older students to use technology in an effective manner in their teaching practice (Hwang et al., 2020). Schools and universities are faced with this digital divide and need to implement specific support measures to ensure equal access to technology for a wide range of age groups (ProFuturo, 2023).

A significant negative correlation ($\rho = -0.569$, $p < 0.001$) between age and basic digital literacy shows that older students are more likely to have lower levels of digital literacy (Table 4.2). This result is in line with research demonstrating that people who have no exposure to digital tools in their early years are likely to be affected by digital literacy problems (European Commission, 2024; Hwang et al., 2020). Given the key role of digital competencies in the modern education system, it is significant for teacher training programs to implement specific interventions to support older students in enhancing their digital literacy (ProFuturo, 2023).

Correlation analysis in Table 4.3 indicates weak negative correlation between sex and technology access, meaning that students of both male and female sexes can have different levels of access. Research findings confirm that technology access and participation differences along gender lines usually emerge from education and social structures and not from differences in ability (Hwang et al., 2020; European Commission, 2024). To tackle such differences, gender-neutral technology programs in institutions of learning should provide equitable opportunities for access to digital tools for all learners (ProFuturo, 2023).

Low positive correlation ($r = 0.33$) between sex and basic digital literacy indicates that female students are slightly more competent compared to male students, as shown in Table 4.4. In spite of research findings of better digital literacy as reported by men, research by Gebhardt et al. (2019) shows that women are more proficient in information retrieval skills. Such complexity calls for the need to adopt a tailored approach to digital literacy training to address all learners with full support according to their unique learning needs (Lim & Zhao, 2024).

Statistically significant negative correlation ($\rho = -0.402$, $p < 0.001$) suggests that the more students progress in their years of study, the lower their level of technology access, as shown in Table 4.5. The trend may be due to increasing demands for academic requirements that limit the access of students to digital resources (Boh et al., 2023). It is important to have continuous access to technology at all levels of academic study to maintain digital literacy and IT resilience, thus calling for interventions by institutions towards equal provision of technology (ProFuturo, 2023).

A negative low correlation ($\rho = -0.476$, $p < 0.001$) between year level of students and their basic digital literacy reflects a decline in digital competence as students move up their academic journey (Table 4.6). This can be due to poor constant reinforcement of digital literacy competencies in the school curriculum (Lee, 2014; Polizzi, 2020). In order to counter the trend, it is necessary that teacher training programs include digital literacy training at all levels so that students may learn and develop required technological competencies (ISTE, 2018; Zhu et al., 2021).

A negative correlation of -0.34 between marital status and access to technology shows that unmarried students have broader access to digital resources than their married counterparts (Table 4.7). This finding is in agreement with previous research capturing how married people are likely to face additional responsibilities that interfere with their exposure to technology (Hossain et al., 2021). Schools must consider offering expert assistance, such as flexible learning, to support IT resilience development among all students regardless of marital status (ProFuturo, 2023).

A negative correlation of -0.31 between marital status and basic digital literacy shows that unmarried students are likely to have improved digital skills compared to their married counterparts (Table 4.8). This trend shows that additional responsibilities involved in marriage may interfere with skill improvement (Hossain et al., 2021). Teacher training programs must implement interventions for married students, such as offering workshops and learning materials that are accessible, to close the digital literacy gap and ensure equal

academic performance (ProFuturo, 2023).

Despite the valuable insights that have been derived from this study, some limitations must be mentioned. The application of a bivariate analytical approach limits the richness of statistical analysis since it only explores direct relationships between pairs of variables without considering interactions or mediating variables that can be revealed by the application of a multivariate analysis. This limitation may lead to oversimplification of the intricate interaction between demographic variables, digital literacy, and access to technology, possibly leading to the neglect of significant patterns. The results are restricted in their generalizability since the study is only carried out on Bachelor of Elementary Education students from a single university, and therefore, it is challenging to generalize the findings to other study programs, institutions, or larger populations. Future research should try to apply multivariate statistical approaches and expand the sample parameters to enable richer understanding of digital literacy and IT resilience in the academic setting.

CONCLUSIONS

The study's findings underscore the strong impact of demographic factors on digital literacy and technology access among students in the Bachelor of Elementary Education program of Eastern Visayas State University. Younger students showed higher digital literacy and better technology access, while older students showed more problems, which reflects the digital divide in the learning environment. Digital literacy variations based on gender were not significant but showed subtle technology engagement patterns. Academic progress resulted in lower access to technology among students, reflecting the need for long-term institutional support to sustain digital literacy across the study period. The findings are beneficial in filling the gap in research through empirical evidence of the nexus among demographic factors, digital literacy, and IT resilience in pre-service teacher education. Although the scope of the study is confined to a single institution, the findings have significant implications for curriculum planning and policy making in teacher education programs, calling for targeted interventions to improve equal access to digital tools and long-term technological capacity among various groups of students.

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