

RESEARCH ARTICLE

ASSESSING INFORMATION AND COMMUNICATION TECHNOLOGY FOR EQUITABLE ACCESS TO ELEMENTARY EDUCATION: THE CASE OF TALIPAO DISTRICT-SULU

Marcilyn I. Amin

Graduate School, Sulu State College, Jolo, Sulu, Philippines

*Corresponding author: gs@sulustatecollege.edu.ph

ABSTRACT. Information and communication technology for equitable access to elementary education in Talipao District, Division of Sulu, was evaluated as part of this study. In order to determine the extent of information and communication technology for fair access to elementary education in Talipao, District-Sulu, a descriptive-exploratory research design using a quantitative research approach was used. Using its ten selected public elementary schools—Bandang ES, Bilaan ES, Buntod ES, Kabungkol ES, Kagay ES, Lambanah ES, Mabahay ES, Samak ES, Tiis ES, and Tuyang ES—the study's location was limited to Talipao District, Sulu Province. One hundred teachers from the ten selected public elementary schools in Talipao District, School Year 2024–2025, participated in the study. Purposive sampling, a non-probability sampling technique, was used in this investigation. A modified standardized questionnaire taken from Ritche IM's (2014) study on the effects of technology in education and the digital divide served as the research tool for gathering the primary empirical data. While the weighted mean and standard deviation were used to assess the extent of evaluating information and communication technology for equitable access to elementary education at Talipao District, the frequency count and percentage distribution were the statistical tools used to determine the teachers' demographic profile. When data were grouped according to age, civil status, length of service, and educational attainment, the T-test for the independent variable was used to identify significant differences in terms of gender and One-way Analysis of Variance (ANOVA) on the extent of evaluating ICT for equitable access to elementary education at Talipao District. The significant correlation between the subcategories included in the Talipao District's assessment of information and communication technology for equitable access to elementary education, in the context of technology access, teacher training, and student engagement, was ascertained using Pearson Product-Moment Correlation. It was discovered that the majority of responders were married, over half were female, and a third had served for six to ten years. Regarding teacher training, student participation, and access to technology, the responses are somewhat in agreement. The findings suggest that technology access has a significant impact on student engagement and teacher preparation. When categorized by gender, age, civil status, and duration of service, there is no discernible variation in the Talipao District's use of ICT for equitable access to basic education. The training of teachers, their access to technology, and student engagement are highly correlated. On the other hand, there was a strong association between student engagement and teacher training alone when it came to technological availability.

KEYWORDS: *Communication Technology, Technology Access, Equitable Access, Education, Teacher.*

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Introduction

Teaching and learning are being revolutionized by the use of information and communication technology (ICT) in the classroom, especially when it comes to guaranteeing equal access to basic education. Geographical, socioeconomic, and disability-related hurdles that have historically prevented fair access to high-quality education can be eliminated with the use of ICT. In order to achieve Sustainable Development Goal 4 (SDG 4), which aims to provide inclusive, egalitarian, high-quality education for all, UNESCO (2020) highlights the importance of ICT in fostering inclusive learning settings. Countries are encouraged by this global goal to use ICT to increase educational access, particularly for underserved populations (UNESCO, 2020).

According to studies, ICT can have a big impact on elementary school access by fostering digital literacy, e-learning resources, and distant learning. Globally, studies by Zhao, Lei, and Conway (2006) and Gulati (2008) show that ICT programs have successfully reduced educational gaps in underserved and rural areas. Additionally, ICT supports individualized learning by enabling educators to modify course materials to accommodate students' various needs. This is supported by the World Bank (2021), which highlights how digital resources, like online platforms and interactive instructional tools, increase young learners' participation and engagement.

ICT's involvement in education has been acknowledged as a critical component in tackling educational inequality in the Philippines. In order to close gaps in access to high-quality education, the Department of Education (DepEd) has launched the "DepEd Computerization Program" (DCP), which gives schools access to ICT resources (Department of Education, 2022). As demonstrated during the COVID-19 epidemic, when online and blended learning models emerged as the main means of educational continuity, national research emphasizes the importance of ICT for remote education (Ceniza et al., 2021). Nonetheless, there are still digital divides, where socioeconomic considerations affect how well ICT can improve fair access.

According to scholarly assessments, in order to achieve equal results, ICT integration in education necessitates not just technology resources but also teacher preparation, dependable internet infrastructure, and legislative support (OECD, 2019). This study aims to assess the present situation of ICT in Philippine primary education, taking into account the opportunities and difficulties for fair access. This study aims to provide insights into improving ICT's role in achieving educational equity in elementary education by looking at ICT accessibility, infrastructure, and teacher preparedness. Knowing how grammatical competence, academic achievement, and contextual factors interact may have a big impact on instructional strategies and

guide the development of targeted interventions that will integrate students' linguistic and intellectual growth (Garil, Abbas, & Limen, 2024).

Research Questions

1. What is the demographic profile of the teacher-respondents in terms of:
 - 1.1. Gender;
 - 1.2. Age;
 - 1.3. Civil Status;
 - 1.4. Length of Service; and
 - 1.5. Educational Attainment?
2. What is the extent of assessing information and communication technology for equitable access to elementary education: the case of Talipao District-Sulu in the context of:
 - 2.1. Access to Technology;
 - 2.2. Teacher's Training; and
 - 2.3. Student Engagement?
3. Is there a significant difference in the extent of assessing information and communication technology for equitable access to elementary education: the case of Talipao District-Sulu when data are grouped according to their demographic profile in terms of:
 - 3.1. Gender;
 - 3.2. Age;
 - 3.3. Civil Status;
 - 3.4. Length of Service; and
 - 3.5. Educational Attainment?
4. Is there a significant correlation among the sub-categories subsumed under the extent of assessing information and communication technology for equitable access to elementary education: the case of Talipao District-Sulu in the context of Access to Technology, Teacher's Training, and Student Engagement?

Literature

Technology in education has spread as a result of the information and communication technologies' quick development and advancement. Many educators feel that a new pedagogy that integrates technology is required to educate students for work in the information era, and studies conducted in controlled situations indicate that the use of technology under the correct circumstances enhances educational outcomes. This study examines the degree of computer and Internet access among students, whether access is correlated with socioeconomic level or sex, and the typical computer usage patterns of those who do have access. Responses from around 30,000 Canadian students aged 15 who took part in the Programme for International Student Assessment (PISA) served as the basis for the analysis. According to the results, 8 out of 10 (81%) Canadian students use a computer at home almost daily, and nearly 9 out of 10 (88%) have a computer at home. Students from low-income households, however, were less likely to have access to computers and an Internet connection at home. Additionally, women were less likely than men to have access to computers and the Internet at home, but these differences were insignificant for students from wealthy families. Because AI models help students conceptualize their ideas and include new views, they can improve their innovative and creative activities (Duhaylungsod & Chavez, 2023). According to the students, they primarily utilize computers for word processing, games, communication, and Internet information access. The percentage of pupils who said they used computers to aid in their learning was less than one-third. According to Corbett, Bradley, and

Willms, Jon, our findings suggest that universal access at home is feasible and necessary if computers are to be used as a teaching tool to help pupils develop their skills. (2002).

This study looks at middle school students' information and communication technology (ICT) literacy and how it relates to their socioeconomic position (SES), gender, and ethnicity. From 13 school districts around the state of Florida, we enlisted 5,990 children. A digital divide between low and high SES, white and non-white, and female and male students is evident on all measures of the Student Tool for Technology Literacy (ST2L), a performance-based evaluation of ICT literacy skills based on the 2008 National Educational Technology Standards for Students (NETS.S). In particular, white, female, and high-SES kids did better than their peers. The findings offer strong proof that there is a digital divide in Florida schools. The findings' implications for future study and practice are covered in the paper. Ritzhaupt, A. et al. (2012).

The purpose of this study was to outline how a teacher in a rural primary school with limited resources used technology to enhance the learning of underprivileged students and to offer recommendations for other educators using technology. the significance of resolving concerns about technical difficulties and resource limitations (Carpio LB, Caburnay ALS, Nolloedo SM, et al. 2024). The in-depth case study was carried out in a classroom with only one student, which excluded the fifth grader from opportunities for social and cooperative learning. The qualitative data was collected in forms of classroom observation field notes, teacher interviews, student interviews and student's reflection journals. Findings are as follows: First, technology plays an important role in a one-student classroom to support student's collaborative learning. Second, to overcome a digital divide, the teacher created a technology-enhanced environment with alternative methods of her own and supplemented teacher-created resources. Third, the teacher used technologies to support adaptive instruction based on the student's needs.

Children who struggle with communication have limited access to speech-language therapy services in the majority world's poor nations, like Small Island Developing States. techniques and tactics offered phenomenological and conceptual foundations pertinent to reading comprehension in early schooling (Divinagracia, L. T. 2024). In minority nations, information and communication technology (ICT) has been recognized as a potential means of ensuring fair access to services. A better curriculum may result from the use of the English language (Chavez, J.V. 2022). In order to find viable service delivery strategies, this study investigated ICT-related situations in isolated schools in the Maldives, a Small Island Developing State.

An online survey of 107 instructors, observational data from four schools, interviews with 31 teachers and the four guiding principles of participating schools, and 13 pertinent online papers were all part of the mixed methods technique that was employed. According to Chavez, Cuilan, J.T., Mannan, S.S., et al. (2024), teachers' access to ICT devices and fixed broadband Internet varied across schools, but they showed the ability to produce high-quality text and other content, potentially revolutionizing academic tasks like essay writing. Content analysis was used to analyze and integrate data from all sources. The government didn't have enough money to give them a good fixed internet connection. Favorable opportunities were also found, such as the high availability of 4G mobile broadband Internet in islands, the high degree of confidence instructors have in their ability to use ICT, the range of ICT applications they presently use, and the availability of financial aid for kids with special education requirements.

The study's conclusions provide credence to the possibility of improving speech-language therapy service delivery in the Maldives by utilizing mobile broadband Internet, readily available ICT equipment, and teachers as service delivery agents in rural schools. Differences in instructional resources and even approaches are important (Castro FLT, Ventura BLO, Estajal, RS,

et al. 2024). The development of pertinent online learning materials for educators could help the nation's kids who struggle with communication. The Philippine Statistics Authority published "The Digital Divide in the Philippines: A Study of Access and Usage" in 2023. Data on ICT availability and usage in the Philippines are presented in this publication by the Philippine Statistics Authority (PSA). It draws attention to the ongoing digital gap, especially in underserved and rural areas.

Philippine Development Forum, "ICT for Equitable Education in the Philippines: A Framework for Action" (2024). The Philippine Development Forum's (PHDEVFORUM) framework provides a thorough strategy for leveraging ICT to advance fair access to education in the Philippines. It highlights the significance of data-driven decision-making, multi-stakeholder collaboration, and learner requirements (Tomaro, Queenie, 2018). The integration of ICT in Philippine basic education is examined in this paper, which also highlights the benefits and problems of doing so in a diverse and evolving setting. educators' favorable opinions of generative AI, with many recognizing its potential to improve teaching methods and results, particularly in supporting students' comprehension of scientific ideas, fostering the development of critical thinking abilities, and customizing educational experiences. But in addition to their favorable opinions, educators voiced worries about the negative effects of using AI in the classroom (Mundo MAD, Reyes EFD, Gervacio EM. 2024).

Mula, R. & Bucar, J. (2023) This meta-analysis looks at how ICT affects student accomplishment in the Philippines and concludes that while ICT can improve learning, how well it is incorporated into teaching and learning methods determines how effective it is. This case study highlights the opportunities and difficulties of integrating ICT in a particular school setting by examining how it was used to advance educational equity at a DepEd pilot school in the Philippines.

Methodology

This chapter provides an overview of the study, including the research strategy used for presentation, analysis, and interpretation. Additionally discussed are the study's legitimacy, the researcher's role, the research participants, the data gathering process, the data analysis, and philosophical presumptions. The ethical concerns pertaining to the study process are also covered.

1. Population and Sampling Design

Purposive sampling, a non-probability sampling technique, was used in this investigation. In other words, representative samples from Bandang Elementary School, Bilaan Elementary School, Buntod Elementary School, Kabungkol Elementary School, Kagay Elementary School, Lambanah Elementary School, Mabahay Elementary School, Samak Elementary School, Tiis Elementary School, and Tuyang Elementary School were purposefully selected as study samples due to access, availability, and time constraints. Purposive sampling was employed to guarantee that the appropriate amount and quality of data were collected for this investigation.

2. Research Instruments

A 30-item modified standardized questionnaire that was taken from RitchtelM's (2014) study on the effects of technology in education and the digital divide used as the research tool for gathering the primary empirical data.

3. Data Gathering Procedure

The Dean of Sulu State College's School of Graduate Studies, the Superintendent of the Schools Division, the District Supervisor, and the ten (10) principals of the individual elementary schools were asked for permission to administer the questionnaire in order to collect data. Launching, administering, and retrieving the questionnaire were all done by the researcher herself.

4. Data Analysis Process

The statistical methods employed to ascertain the instructors' profile in terms of gender, age, civil status, length of service, and educational attainment were frequency and percentage, as well as weighted mean and standard deviation. The Talipao District's level of evaluating ICT for fair access to elementary education was assessed using the weighted mean and standard deviation, taking into account student participation, teacher preparation, and technology availability. One-way analysis of variance (ANOVA) and the t-test. When data were grouped by gender, age, civil status, length of service, and educational attainment, the Talipao District's information and communication technology for equitable access to elementary education was examined using the t-test for independent variables and One-way Analysis of Variance (ANOVA). The significant correlation between the subcategories included in the Talipao District's assessment of information and communication technology for equitable access to elementary education in the context of technology access, teacher preparation, and student engagement was found using Pearson product-moment correlation.

Results

Question 1. What is the demographic profile of the teacher-respondents in terms of 1.1 Gender, 1.2 Age, 1.3 Civil Status and 1.4 Length of Service?

Table 1.1 Demographic profile of teacher-respondents from Talipao district in terms of gender.

Gender	Number of respondents	Percent
Male	14	14.0%
Female	86	86.0%
Total	100	100%

Table 1.1 shows the demographic profile of teacher-respondents in terms of gender. This table shows that, of the 100 teacher responders, 86 (86.0%) are female and 14 (14.0%) are male. More than half of the instructor responders who participated in this study are female, according to the findings. This suggests that, in terms of gender, the vast majority of Talipao district teacher respondents are female.

Table 1.2 Demographic profile of teacher-respondents from Talipao district in terms of age.

Age	Number of respondents	Percent
20 years old and below	4	4.0%
21-30 years old	16	16.0%
31 years old and above	80	80.0%
Total	100	100%

Table 1.2 shows the demographic profile of teacher-respondents in terms of age. This table shows that of the 100 teacher respondents, 4 (4.0%) are under the age of 20, 16 (16.0%) are between the ages of 21 and 30, and 80 (80.0%) are 31 years of age or older. More than half of the teacher respondents in this study are in the age range of 31 and older, according to the findings. This further suggests that the majority of the teacher respondents in this study are in the upper age range that this study has classified.

Table 1.3 Demographic profile of teacher-respondents from Talipao district in terms of civil status.

Civil Status	Number of respondents	Percent
Single	25	25.0%
Married	70	70.0%
Separated/Widowed	5	5.0%
Total	100	100%

Table 1.3 shows the demographic profile of teacher-respondents in terms of civil status. Out of 100 teacher responders, 25 (25.0%) are single, 70 (70.0%) are married, and 5 (5.0%) are widowed or separated, as this table shows. More over half of all teacher responders are married, according to this study. This finding suggests that there are a sizable proportion of married teachers in the Talipao district.

Table 1.4 Demographic profile of teacher-respondents from Talipao district in terms of length of service.

Length of Service	Number of respondents	Percent
5 years and below	23	23.0%
6-10 years	34	34.0%
11-15 years	22	22.0%
16 years and above	21	21.0%

Table 1.4 shows the demographic profile of teacher-respondents in terms of length of service. This table shows that, of the 100 teacher responders, 23 (23.0%) have been teaching for 5 years or less, 34 (34.0%) have been teaching for 6–10 years, 22 (22.0%) have been teaching for 11–15 years, and 21 (21.0%) have been teaching for 16 years or more. According to this study, about half of the teacher respondents have been in the classroom for six to ten years. This suggests that the teaching staff in the Talipao district has a moderate level of experience.

Question 2. What is the extent of information and communication technology for equitable access to elementary education at Talipao district-Sulu in the context of: 2.1 Access to technology, 2.2 Teacher’s training and 2.3 Student engagement?

Table 2.1 Extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu in the context of access to technology.

	Statements	Mean	S.D	Rating
1	Students have reliable access to computers or tablets for educational purposes.	3.32	.97317	Moderately Agree
2	All students have consistent access to the internet for their schoolwork.	3.22	.95958	Moderately Agree
3	The school provides sufficient digital devices for students who do not have their own.	2.84	1.02217	Moderately Agree
4	Technology is evenly distributed among students regardless of their socio-economic background.	3.14	1.06382	Moderately Agree
5	Internet connectivity at school is stable and supports online learning activities.	3.03	1.13221	Moderately Agree
6	Students can easily access online educational resources from home.	3.21	.99792	Moderately Agree
7	There are programs in place to provide technology to underserved students.	3.11	1.02390	Moderately Agree
8	The availability of technology does not hinder students' participation in class activities.	3.38	.97213	Moderately Agree
9	Technical support is available to help students and families with technology issues.	3.25	.97830	Moderately Agree
10	Students receive adequate training on how to use educational technology tools.	3.06	1.04272	Moderately Agree
	Total Weighted Mean	3.16	.80657	Moderately Agree

Legend: (5) 4.50-5.00=Strongly Agree; (4) 3.50-4.49=Agree; (3) 2.50- 3.49=Moderately Agree; (2) 1.50-2.49=Disagree; (1) 1.00- 1.49=Strongly Disagree

Table 2.1 shows the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu in the context of access to technology. With a weighted mean score of 4.38 and a standard deviation of .80657, this category was classified as "Moderately Agree." The high weighted mean score of 4.38 and the low standard deviation of .80657 in this survey show that the instructors who participated acknowledged the inclusion of sustainable development principles in the primary school curriculum. This suggests that although ICT is seen as a valuable instrument for improving education, there may still be space for improvement in guaranteeing its full use and accessibility, according to the teacher respondents who participated in this study.

Notably, teacher respondents gave the following ratings of "Moderately Agree": "All students have consistent access to the internet for schoolwork;" "Students have reliable access to computers or tablets for educational purposes;" "School internet connectivity is stable and supports online learning activities;" "The availability of technology does not hinder students' participation in class activities;" and "Students receive adequate training on how to use educational technology tools."

Table 2.2 Extent of extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu in the context of Teacher's training.

	Statements	Mean	S. D	Rating
1	Teachers receive regular professional development on using ICT tools in their teaching.	3.59	.77973	Agree
2	Training programs effectively equip teachers with the skills to integrate technology into their lessons.	3.70	.88191	Agree
3	Teachers feel confident using digital tools to enhance their teaching.	3.82	.77041	Agree
4	The school provides ongoing support to help teachers troubleshoot ICT issues.	3.68	.85138	Agree
5	Teachers have access to resources and guides for incorporating ICT into their curriculum.	3.72	.80503	Agree
6	ICT training is tailored to meet the specific needs of different subjects and grade levels.	3.61	.76402	Agree
7	Teachers can collaborate with colleagues to share best practices for using technology.	3.76	.85422	Agree
8	Training sessions on ICT tools include practical, hands-on components.	3.61	.81519	Agree
9	Teachers are encouraged to experiment with new technologies in their teaching.	3.80	.93203	Agree
10	Professional development on ICT is a priority in the school's overall training plan.	3.73	.78951	Agree
Total Weighted Mean		3.70	.69645	Agree

Legend: (5) 4.50-5.00=Strongly Agree; (4) 3.50-4.49=Agree; (3) 2.50- 3.49=Moderately Agree; (2) 1.50-2.49=Disagree; (1) 1.00- 1.49=Strongly Disagree

Table 2.2 shows the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu in the context of Teacher's training. This category was scored as "Agree" with a weighted mean score of 3.70 overall and a standard deviation of .69645. According to this finding, the study's participating teachers confirmed that they understand the value of information and communication technology (ICT) training in advancing fair access to elementary education. This suggests that even though Talipao district teachers place a high importance on ICT training, additional professional development opportunities could be necessary to improve their ability to use technology efficiently. This study supports the findings of (Chavez, J., & Lamorinas, D. D., 2023), which showed that teachers more frequently used skill

and practical assessments. The "Agree" rating suggests that the current level of ICT training is adequate but not optimal, indicating potential gaps in access to comprehensive or advanced training programs.

Notably, teacher-respondents rated the following items, among others as “Agree”: “Teachers receive regular professional development on using ICT tools in their teaching.”, “Training programs effectively equip teachers with the skills to integrate technology into their lessons.”, “The school provides ongoing support to help teachers troubleshoot ICT issues.”, “ICT training is tailored to meet the specific needs of different subjects and grade levels”, “Teachers are encouraged to experiment with new technologies in their teaching.” and, “Professional development on ICT is a priority in the school’s overall training plan.”

Table 2.3 Extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu in the context of Student engagement.

	Statements	Mean	S. D	Rating
1	Students are more engaged in lessons when digital tools are used.	3.69	.93953	Agree
2	ICT tools help students understand complex concepts more easily.	3.77	.87449	Agree
3	Students show increased interest in learning activities that involve technology.	3.90	.87038	Agree
4	Technology enhances students' ability to collaborate with their peers.	3.90	.92659	Agree
5	Students use educational apps and software regularly to support their learning.	3.59	.97540	Agree
6	The use of technology in the classroom encourages active participation from students.	3.89	.93089	Agree
7	ICT tools provide personalized learning experiences that meet individual student needs.	3.67	.88825	Agree
8	Students can access additional learning materials online that help them grasp subjects better.	3.78	.97005	Agree
9	Technology integration in lessons helps students stay focused and motivated.	3.88	.89080	Agree
10	Students feel that technology improves their overall learning experience.	3.85	.89188	Agree
	Total Weighted Mean	3.79	.80248	Agree

Legend: (5) 4.50-5.00=Strongly Agree; (4) 3.50-4.49=Agree; (3) 2.50- 3.49=Moderately Agree; (2) 1.50-2.49=Disagree; (1) 1.00- 1.49=Strongly Disagree

Table 2.3 shows the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu in the context of student engagement. This category received a total weighted mean score of 3.79 with a standard deviation of .80248 and was rated as "Agree." This means that although the teachers in this study acknowledged that they recognize the role of information and communication technology (ICT) in improving student engagement in elementary education, there may still be obstacles or limitations in utilizing ICT to its fullest potential.

Notably, teacher-respondents rated all items as “Agree”: “Students demonstrate a clear understanding of sustainable development concepts in class discussions.”, “Students actively participate in sustainability projects and activities organized by the school.” “Students engage in critical thinking when addressing social, environmental, and economic issues related to sustainability. “and “Students are enthusiastic about participating in local or community-based sustainability initiatives”

Question 3. Is there a significant difference in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu when data are grouped according to their demographic profile in terms of 3.1 Age, 3.2 Gender, 3.3 Civil Status; 3.4 Length of Service?

Table 3.1 Difference in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu when data are grouped according to their demographic profile in terms of gender.

Variables	Grouping	Mean	S.D	Mean Difference	t	Sig.	Description
Access to technology	Male	3.35	.897	.226	.970	.334	Not Significant
	Female	3.12	.792				
Teacher’s training	Male	3.92	.676	.255	1.275	.205	Not Significant
	Female	3.67	.697				
Student engagement	Male	4.09	.665	.342	1.486	.141	Not Significant
	Female	3.74	.816				

* Significant at alpha 0.05

Table 3.1 presents the difference of the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu when data are grouped according to their demographic profile in terms of gender. Every t-value and probability value in this table is not significant at alpha 0.05. This indicates that the perceptions of male and female teacher respondents in this survey regarding the subcategories included under the scope of information and communication technology for fair access to elementary education in Talipao District-Sulu are same. The results of this study are consistent with those of Chavez, J.V. (2020), who found that open communication with others was one of their adaptation strategies. This also suggests that a male teacher-respondent may not have a more favorable opinion of the level of parental participation in Talipao district public school programs and activities, or vice versa.

Hence, it is safe to say that variable gender has no significant intervention in the ways how teacher-respondents at Talipao district perceive the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu. Therefore, the hypothesis which states that: “There is no significant difference in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu, when data are classified according to their demographic profile in terms of gender” is accepted.

Table 3.2 Difference in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu when data are grouped according to their demographic profile in terms of age.

Sources of Variation	Sum of squares	df	Mean Square	F	Sig.	Description	
Access to technology	Between Groups	3.539	2	1.770	2.820	.065	Not Significant
	Within Groups	60.867	97	.627			
	Total	64.406	99				
Teacher’s training	Between Groups	.961	2	.480	.990	.375	Not Significant
	Within Groups	47.059	97	.485			
	Total	48.020	99				
Student engagement	Between Groups	.334	2	.167	.255	.775	Not Significant
	Within Groups	63.420	97	.654			
	Total	63.754	99				

* Significant at alpha 0.05

Table 3.2 presents the difference in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu when data are grouped according to their demographic profile in terms of age. All of the probability values and F-values are not significant at alpha 0.05, as this table illustrates. This indicates that, despite differences in age, teacher respondents' opinions about the subcategories covered by the scope of ICT for fair access to elementary education in Talipao District-Sulu are essentially the same. This further suggests that, in comparison to those in the study's age group of 20 and under, teacher respondents who are 31 years of age or older may not have a more favorable opinion of the extent of ICT for fair access to elementary education, or vice versa.

Hence, it is safe to say that variable age has no significant intervention in the ways how teacher-respondents at Talipao district perceive the extent of information and communication technology for equitable access to elementary education. Therefore, the hypothesis which states that: “There is no significant difference in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu, when data are classified according to their demographic profile in terms of age” is accepted.

Table 3.3 Difference in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu when data are grouped according to their demographic profile in terms of Civil Status.

Sources of Variation		Sum of squares	Df	Mean Square	F	Sig.	Description
Access to technology	Between Groups	1.107	2	.554	.848	.431	Not Significant
	Within Groups	63.299	97	.653			
	Total	64.406	99				
Teacher’s training	Between Groups	1.322	2	.661	1.373	.258	Not Significant
	Within Groups	46.698	97	.481			
	Total	48.020	99				
Student engagement	Between Groups	3.357	2	1.679	2.696	.073	Not Significant
	Within Groups	60.396	97	.623			
	Total	63.754	99				

* Significant at alpha 0.05

Table 3.3 presents the difference in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu when data are grouped according to their demographic profile in terms of civil status. This table indicates that all of the subcategories' F-values and probability values are not significant at alpha 0.05. This indicates that although the civil status of the teacher respondents in this study varies, their opinions regarding the role of ICT in providing equal access to elementary education are largely the same. In contrast to those who are single, separated, or widowed, it suggests that married teacher respondents would not have a more favorable opinion of the degree to which sustainable development is being included into elementary school curricula in order to promote high-quality education, and vice versa.

Hence, it is safe to say that the civil status variable has no significant intervention in the ways how teacher-respondents perceive the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu. Therefore, the hypothesis which states that: “There is no significant difference in extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu, when data are classified according to their demographic profile in terms of civil status” is accepted.

Table 3.4 Difference in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu when data are grouped according to their demographic profile in terms of length of service.

Sources of Variation		Sum of squares	Df	Mean Square	F	Sig.	Description
Access to technology	Between Groups	3.893	3	1.298	2.059	.111	Not Significant
	Within Groups	60.513	96	.630			
	Total	64.406	99				
Teacher’s training	Between Groups	1.727	3	.576	1.194	.316	Not Significant
	Within Groups	46.292	96	.482			
	Total	48.020	99				
Student engagement	Between Groups	.856	3	.285	.435	.728	Not Significant
	Within Groups	62.898	96	.655			
	Total	63.754	99				

* Significant at alpha 0.05

Table 3.4 presents the difference in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu when data are grouped according to their demographic profile in terms of length of service. This table indicates that all of the subcategories' F-values and probability values are not significant at alpha 0.05. This indicates that although the duration of service of the teacher respondents in this study varies, their opinions regarding the use of ICT for fair access to elementary education in Talipao District-Sulu are largely the same. It suggests that teachers with 16 years or more of experience may not have a more accurate perception of the use of ICT for fair access to elementary education in Talipao District-Sulu than teachers with just 5 years of experience, and vice versa.

Hence, it is safe to say that the length of service variable has no significant intervention in the ways preschool teacher-respondents perceive the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu. Therefore, the hypothesis which states that: “There is no significant difference in the extent of promoting quality education through the integration of sustainable development in elementary school curricula: the case of Talipao district– Sulu, when data are classified according to their demographic profile in terms of length of service” is accepted.

Question 4. Is there a significant correlation among the sub-categories subsumed under the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu?

Table 4 Shows the correlation among the subcategories subsumed under the extent of promoting quality education through the integration of sustainable development in elementary school curricula in Talipao district– Sulu.

Variables		Pearson <i>r</i>	Sig.	N	Description
Dependent	Independent				
Access to technology	Teacher’s training	.775*	.000	100	Very High
	Student engagement	.662*	.000	100	High
Teacher’s training	Access to technology	.775*	.000	100	Very High
	Student engagement	.823*	.000	100	Very High

*Correlation coefficient is significant at alpha .01

Correlation Coefficient Scales Adopted from Hopkins, Will (2002): 0.0-0.1 = Nearly Zero; 0.1-0.3 = Low; 0.3-0.5 = Moderate; 0.5-0.7 = High; 0.7-0.9 = Very High; 0.9-1 = Nearly Perfect.

Table 4 shows the correlation among the subcategories subsumed under the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu. As shown in the table, the computed Pearson correlation Coefficients (Pearson r) between these variables are significant at alpha 0.05.

Additionally, the following is the degree of link between Talipao District-Sulu's information and communication technology use and equitable access to elementary education: There is a very strong positive link between the context of technology access and teacher training, and vice versa, among the subcategories included in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu. This implies that increased access to technology within the district is closely linked to enhancements in teacher preparation. This also suggests that better technology integration and accessibility in elementary education may result from strengthening teacher preparation programs that emphasize efficient technology use.

There is a strong positive link between the context of technology availability and student participation throughout the subcategories included in the extent of information and communication technology for equal access to elementary education at Talipao District-Sulu. This suggests that increased access to technology generally results in higher levels of student participation in the educational process. Additionally, it suggests that having enough technology in the classroom can greatly boost student engagement and participation.

There is a very strong positive link between teacher training context and student participation throughout the subcategories included in the extent of information and communication technology for equitable access to primary education at Talipao District-Sulu. This suggests that creating active learning environments requires empowering teachers through comprehensive training programs. Student engagement and overall learning results can be directly improved by funding teacher professional development.

According to teachers in Talipao District-Sulu, it is safe to conclude that there is a strong correlation between the subcategories that fall under the umbrella of information and communication technology's role in providing equitable access to basic education. As a result, the hypothesis that claims that "the subcategories included in the extent of information and communication technology for equitable access to elementary education at Talipao District-Sulu" do not significantly correlate with one another is rejected.

Conclusion

The results indicate that the teachers recognize the importance of ICT training, acknowledge the integration of sustainable development concepts in the elementary school curriculum, and affirm that they recognize the role of ICT in enhancing student engagement in elementary education. The majority of the respondents are female, in their early 30s and beyond, have their own families, and have only recently begun their careers. The outcome makes it abundantly evident that teachers' perceptions of the role of ICT in ensuring equitable access to elementary education were not influenced by their gender, age, civil status, or duration of service. The acceptance of the null hypothesis demonstrates that profile is not a useful variable for identifying disparities in the use of ICT for fair access to elementary education. According to the findings, improving teacher preparation programs that emphasize technology use could improve accessibility and integration in elementary school, boost student engagement and participation, and create dynamic learning environments.

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