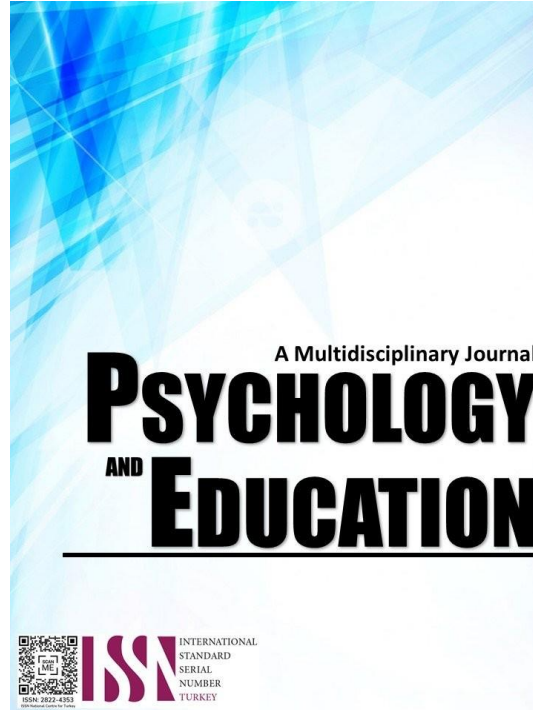


**STUDENTS' KNOWLEDGE IN GADGETS USAGE AND ITS RELATIONSHIP  
TO THEIR PERFORMANCE IN INFORMATION COMMUNICATION  
TECHNOLOGY (ICT)**



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## Students' Knowledge in Gadgets Usage and its Relationship to their Performance in Information Communication Technology (ICT)

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### Abstract

Technology brought digital division among the learners of this century (21st-century learners). But questions always arise like these; are these Digital Natives (learners) who are unfortunately living in these drawn-out places can knowledgeable of using digital gadgets? and what is their knowledge on digital gadgets and its relationship to their academic performance in Information Communication Technology (ICT)? Since, Bulalo Elementary School is located in one of the islands in the municipality of Taytay, province of Palawan. Sitio Bulalo is part of Bgy. San Jose, Taytay, Palawan. It is considered a far-flung island where no electricity and without means of communication. Therefore, to respond the challenge/s of technology education in the far-flung islands, the researchers would like to examine to the students' knowledge of digital gadgets usage and its effect to their academic performance in ICT. The study design was Quantitative-Descriptive Correlational. This study, determined that family income and mother's educational attainment are significantly correlated. These two indicators greatly affect the academic performance of the students in Information Communication Technology (ICT). Furthermore, student's knowledge of all digital gadgets listed in this study are all significant correlated. It implies that digital gadget usage has a huge impact on their academic performance in ICT. Thus, the researchers recommended that the school must have additional computer packages including other digital gadgets for the students to use regularly. In addition, parents must be subjected to training or workshop on digital gadgets usage. Lastly digital gadget usage must be taught and integrated in all subject areas.

**Keywords:** *students, knowledge, performance, relationships*

### Introduction

Quality of life assessment of small island dwellers has often been approached by analyzing levels of their social, economic, and cultural isolation, determined primarily by their geographical position: a sea-bounded landscape (Barrowclough, 2010, p. 28). However, the construction of modern infrastructure (communal utilities, transport, telecommunications) and the development of new technologies in recent decades have reduced the effects of the limiting dimensions of islandness, improving connections between island and mainland at multiple levels (in terms of increased accessibility of goods, services, and institutional services from the mainland, as well as education and work opportunities), and a variety of shared services (such as health care) (Podgorelec, Gregurović, and Bogadi 2015).

Bulalo Elementary School is located on one of the islands in municipality of Taytay, province of Palawan. It is considered a far-flung island where no electricity and without means of communication. As stated by Joseph Quetorio Sr., founder of Sitio Bulalo, the school was started in 1980 headed and taught by lone teacher with one-grade level-first grade. The area of learning at the time was a bahay-kubo owned by one of the pioneered residents in Sitio Bulalo. As the years passed by, there were additional grade levels were opened-grades 1-3 year. Later in three (3) years, Bulalo Elementary School was recognized by the Department of Education Culture and Sports (DECS) in 1983, through the help of Mr. Leoncio Paulino. The name mentioned was considered as a founder of the school as he traveled back in forth, used a paddle boat just to reach the city proper, and process the documents needed for school opening. The traditional methods of teaching were exist-in this period-chalk and board were the teachers' arm to win the battle against ignorance (author's interview).

In this case, we can't eliminate the digital division among the learners of this century (21st-century learners). But questions always arise like these; are these Digital Natives (learners) who are unfortunately living in these drawn-out places can be knowledgeable in using digital gadgets? and what its relationship to their academic performance in Information Communication Technology (ICT).

According to Bennett (2008), termed 'digital natives' or the 'Net generation', these young people are said to have been immersed in technology all their lives, imbuing them with sophisticated technical skills and learning preferences for which traditional education is unprepared. As cited by Helsper, Ellen and Eynon, Rebecca (2009) Prensky, defined this younger generation as the digital natives as they are all "native speakers" of the digital language of computers, video games, and the Internet" (2001a:1). As discussed by Rotas and Cahapay, (2020) these are few themes of difficulties in remote learning in the Philippines: unstable internet connectivity; electric power interruptions; poor learning environment; and financial related problems.

To respond to the challenge/s of technology education, the researcher would like to examine the students' knowledge of digital gadgets usage and its effect to their academic performance in ICT.

According to Rodrigo (2011) the Philippines is a developing country in Southeast Asia whose educational system shares many of the same problems and limitations as those of its fellow developing nations. Despite these conditions, the Philippines along with other developing countries in Asia, Africa, and South America are generally interested in educational technology, particularly in ICT, hoping

that their educational systems reap the pedagogical benefits associated with it.

Hence, the researchers aim to reveal; students' knowledge in the utilization of technology-based assessment and its effect to their academic performance in ICT.

There are numerous pieces of research have been made related to digital gadgets usage nonetheless, the common respondents have been participating mostly came from urbanized areas where the technology is. Thus, this study will be conducted on a selected in a far-flung island where the respondents are not yet tested the same manner of study.

### Research Questions

This study aims to investigate the knowledge of the respondents and their academic performance in Information Communication Technology thus, it sought to answer the questions below.

1. What is the demographic profile of the respondents in terms of:
  - 1.1. family income;
  - 1.2. parents' educational background;
  - 1.3. parents' occupation; and
  - 1.4. availability of gadgets at home?
2. What is the knowledge of the respondents in digital gadgets usage?
3. What is the level of academic performance of the respondents in ICT?
4. Is there a significant correlation between students' demographic profile and their academic performance in ICT?
5. Is there a significant correlation between students' knowledge in digital gadgets usage and their academic performance in ICT?

### Literature Review

Lyons & Wells (2015), ICT skills are becoming increasingly imperative as the world continues to change from a manufacturing and industrial-based economy to one that is being propelled by technological innovation, knowledge and information. This suggests policies that favour the infusion of digital literacy skills into the curriculum need to be established, and a framework constructed that allows students to acquire a range of skills and dispositions associated with 21st century literacy. This needs to be supported by policy-makers, educational leaders and key stakeholders, which suggests education and awareness is a key priority

Beqiri & Idrizi (2015) simultaneous study on Standard of Schools Run by the Communications and Information Technology, they recommend: (1) each school should have access to the internet, also the quality and sustainability of the service need to be increase, (2) at home should be parents who control the technology, while teachers should teach students how to use the technology, not to abuse. (3) students need to use the computer as a technological tool integrated into learning, not only on the case of IT, but also in the other subjects, (4) teachers must participate in various conferences where the topic is application of technology and modern methods in schools.

Gorra & Bhati, (2016) since Philippines is a developing, it is relevant to examine some of the studies on e-learning in developing countries. Their study suggested that though e-learning can be very effective tool and efficient framework for learning in developing countries particularly in rural and remote area which are not easily accessible, yet lot needs to be done to make the technology easily acceptable in developing countries. They suggested that well-organised monitoring and control programs, support for students and lecturers in use of technology can help in improving the quality of education in developing countries.

Leonard Kroutz, Liesl et al. (2016) their study proved that although many students entering their first year at UWC may have had previous exposure to technology, there remains a need to educate students on the basic digital literacy skills needed at university level through specific support programmes such as the one offered by the DAL. The data suggests that Marc Prensky's theory which assumes an entire generation is differently wired due to technological exposure is flawed. It is therefore impossible to accept a blanket theory which our data collection and analysis, proves untrue. Possible avenues for future research include further investigation into addressing the failure rate of students who fall into the Digital Native category.

Starkey, Sylvester, & Johnstone (2017), the review of literature they conducted found out that there are three categories of digital divide in schools – access divide, capability divide and participation divide. They added that schools focused more on access divide by exerting effort on investing to technological resources, and in developing capability for teachers thru trainings. While the first level of digital divide known as infrastructure divide has been slowly addressed, still there was a large divide on quality of computer instruction (Yang, Hu, Qu, Lai, Shi, Boswell, & Rozelle, 2013) where teachers play a major role.

Creighton (2018) The term "Digital Native" seems to have first appeared in the literature in the late 1990s and is mostly accredited to Prensky (2001a, 2001b). Students (called digital natives) are those born roughly between 1980 and 1994, and represent the first generation to grow up with new technology and have been characterized by their familiarity with and confidence in, with respect to Information and Communication Technologies (ICT). They have spent most of their lives surrounded with digital communication technology (Gallardo-Echenique, Marques-Molas, Bullen, & Strijbos, 2015).

Martínez & Jaimes (2018) Revealed from the series of their study: digital technologies have reached a ubiquitous presence around the world, permeating the economic, social, political and cultural spheres (Gere, 2008). As they cited, schools can contribute to familiarizing education actors with the digital world at large.

The digital culture not only influences traditional activities and pedagogical processes, but creates a language all its own (Cetic.br, 2016). They concluded, one of the main reasons to invest in ICT in education is that these tools can promote student learning – either because ICT complements teaching practices, motivates students to engage with their learning processes, or reaches populations that otherwise would not have the opportunity to learn, among other explanations. The common goal is that students learn and enhance their academic performance.

As cited by Rotas, E. & Cahapay, M. (2020) in the Philippine context, remote learning reveals a digital divide among Filipino students (Santos, 2020). This current situation in remote learning may most possibly exacerbate existing inequalities and may translate to barriers in online learning. Despite the efforts to make education accessible for all, many difficulties are still confronting Filipino university students in the practice of distance education. Consequently, a poor learning environment is detrimental to students to comfortably participate in remote learning. This difficulty has been repetitively revealed in students' responses. Establishing a positive and conducive learning space has long been a problem in distance education, especially in most poor households (Baticulon et al., 2020).

Joseph, Benitez, Tom, and Deiparine (2020) technology has affected and changed the way people live and it has made people's lives more proficient and at ease. There is hardly anyone who has not been changed by the advances in technology and computers of today's society. Communication, transportation and education have been greatly developed from new technological advancements. Many people have lesser stress in their lives because there are new useful hi-tech inventions created each day to help them do things quicker and easier. Some of these helpful technologies are cell phones, computers, laptops, tablets and the Internet

Local studies particularly in Philippines setting as reported by Atienza (2021), highlighted the importance of technology in reliable information infrastructure to connect those unserved, underserved, and geographically disadvantaged areas in the country. Department of Science and Technology Institute (DOST) pushed through the Resilient Education Information Infrastructure for New Normal or Project REIINN. Through this project, rural areas will be connected to the online world. This approach is providing connectivity to unserved, underserved, and geographically disadvantaged areas.

## Methodology

### Research Design

The study used a descriptive correlational method of research. Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations (Bhandari, 2021) This method tabulated the gathered data on students' knowledge of digital gadgets usage and their academic performance in Information Communication Technology (ICT).

### Respondents

This study used a Stratified Random Sampling Technique and consists of grades four (4), five (5), and six (6) pupils of Bulalo Elementary School, Bulalo, San Jose, Taytay, Palawan. The total number of respondents consisted of sixty (60) learners who were officially enrolled during the School Year 2021-2022. The selection criteria for respondents were subjected to pupils with gadgets at home. In getting the sample respondents the authors used a Slovin's formula and to select the sample respondents Lottery/Fishbowl method was used.

### Instrument

The researchers used a Self-Administered Questionnaire.

#### Validity of the Instrument

The questionnaire went through the process of validation. It was validated by the Master Teachers and Language Teachers of Taytay District III.

#### Reliability of the Instrument

As cited by Monserate (2018), a research instrument is reliable if there is consistency, stability, and dependability of the data, which is a reliable measuring device, is one which, if used for the second time, will yield the same results as it did the first time (David, 2002).

The researchers used the test-retest reliability technique to come up with the reliable questionnaire.

Twenty (20) students from Leba Elementary School and another twenty (20) from Tulduan Elementary School were chosen to dry-run the data gathering. Cronbach's Alpha Test used to correlate the result. The result of the reliability analysis is presented in Table 1.

The table shown the result of the reliability test using Cronbach's Alpha Test. The table exposes that the instrument was tested reliably. Moreover, questions about the student's knowledge of digital gadgets usage has a coefficient of 0.880 interpreted as reliable

Table 1. *Cronbach's Alpha Reliability Analysis on the Instruments*

Indicator	Cronbach's Alpha	Interpretation
Student Knowledge In Digital Gadgets Usage	0.880	Reliable

## Data Analysis

The researchers used Frequency count, Percentage, Mean, and Pearson Correlation.

## Results and Discussion

Table 2. *Parent's Demographic Profile n=60*

Profile	Frequency	Percentage
Income		
P 1, 000.00 - 2,000.00	18	30
P 3, 000.00 - 4,000.00	26	43
P 5,000.00 above	16	27
Educational attainment		
Mother		
Elementary level	22	37
Elementary Graduate	11	18
Secondary Level	6	10
Secondary Graduate	2	3
College Level	1	2
College Graduate		
Father Educational Attainment		
Elementary level	16	27
Elementary Graduate	22	37
Secondary Level	10	17
Secondary Graduate	10	17
College Level	1	2
College Graduate	1	2
Occupation		
Fishermen	30	50
Farmer	10	17
Government Employee	1	2
Private Employee	9	15
Business/Store etc.	10	17
Total	60	100
Availability of Digital Gadgets at Home		
Mobile phone	22	42
Laptop	1	2
Tablet	10	19
Portable TVs	17	33
Television	2	4
Total Digital Gadgets	52	100

**Income.** Table 2 shown the parent's socio-economic profile in terms of income. It presents most of the parents belong to poor families. The data obtains the highest income of the parents ranged from P 3000.00-4000.00 with the frequency of twenty-six (26) out of sixty (60) respondents or forty-three (43%) of the total respondents. The lowest income gains by the parents ranged P 1000.00-2000.00, eighteen (18) out of sixty (60) respondents which are thirty (30%) of the total respondents. The highest income is sixteen (16) out of sixty (60) respondents or twenty-seven (27%) percent.

**Mother's educational attainment.** The table displays the mother's educational attainment. The highest educational attainment had of the respondent belonged to an elementary graduate with the total of twenty-two (22) out of 60 respondents or thirty-seven percent (37%). Additional to Elementary education, those who took their elementary education but did not finish with eighteen (18) out of sixty (60) respondents or thirty-seven percent (30%) of total population. Though, secondary level got six (6) out of sixty respondents or ten percent (10%) while undergraduate were eleven (11) or eighteen percent (18%). Lastly, the college level two (2) or three percent though college graduate only one (1) or two percent (2%).

**Father's Educational attainment.** The table illustrates the respondents' father's educational attainment. The highest educational attainment that the parent had were elementary graduates with a total of twenty-two (22) out of 60 respondents or thirty-seven (37%) percent. Some went to elementary education but did not finish their primary education with sixteen (16) out of sixty (60) respondents or twenty-seven (27%) percent of the total population. On the other hand, secondary education got frequency count both ten (10) or seventeen percent (17%). However, college education was both one (1) out of sixty respondents with two percent (2%).



**Occupation.** The data appears the parent socio-demographic profile in terms of occupation. The data interpreted that most of the parents of the respondents were fishermen as it was thirty (30) out of sixty (60) or fifty percent (50 %) of the total population. Next in rank were the farmers and with business as got ten (10) or seventeen (17%) and it was followed by the private sector with nine (9) or fifteen percent (15%). Last in a row, government employees with one (1) or two percent (2%) of the total population.

**Gadgets Availability.** The data exposes the availability of gadgets at home wherein mobile phone has the highest frequency score with twenty (22) or forty-two (42%). While Portable TV is next in the list with seventeen (17) or thirty-three percent (33%). Next is Tablets with a frequency of ten (10) or nineteen percent (19%) while television with occurrence count of two (2) or four (4%) and Laptop with a rate of one (1) or two percent (2%).

Table 3. *Students' knowledge in gadgets' usage n=60*

Indicator		Mean	Interpretation
Mobile phone	Alam kong mag on/off	4.80	Good
	Alam mag-encode ng text messages	4.50	Good
	Alam kong mag-download ng mga aplikasyon para sa aking mobile phone	3.55	Good
	Alam kong gumawa ng video gamit ang aking cellphone	3.18	Average
	Alam kong mag-edit ng mga litrato sa aking cellphone	3.52	Good
Grand Mean		3.91	Good
Laptop	Alam kong mag on/off ng laptop	3.15	Average
	Alam kung gumamit ng word office (word, powerpoint, excel etc.) sa laptop	2.20	Average
	Alam kong magbukas ng files sa laptop	2.05	Poor
	Alam kong mag-save ng files sa laptop	2.05	Poor
	Alam kong gumamit ng shortcut keys sa laptop	2.01	Poor
Grand Mean		2.29	Poor
Tablet	Alam kong mag on/off ng tablet	3.52	Good
	Alam kong gumamit ng word office (word, powerpoint, excel etc.) sa tablet	3.28	Average
	Alam kong maglipat ng mga aplikasyon galing sa cellphone	3.30	Average
	A/am kong mag-save ng mga dokumento na aking ginawa	3.33	Average
	Alam kong magpasa ng mga dokumento galing sa tablet papunta sa ibang gadgets	3.50	Good
Grand Mean		3.38	Average
Portable TV's	Alam kong mag on/off ng Portable TV	4.20	Good
	Alam kong maglagay ng DVD para manood ng bidyo	4.50	Very Good
	Alam kong magmani-obra ng settings ng portable TV	3.50	Good
	Alam kong mag-connect ng portable TV sa speaker set	3.50	Good
	Alam kong ayusin ang cable para maayos ang signal kapag ito'y nagloloko	3.32	Average
Grand Mean		3.80	Good
Television	Alam kong mag on/off ng television	3.51	Good
	Alam kong maglagay ng USB para manood ng bidyo o mga palabas sa television	3.28	Average
	Alam kong magmani-obra ang remote control para hanapin ang iba't ibang channel	3.26	Average
	Alam kong mag-connect ng portable TV sa speaker set	2.10	Poor
	Alam kong mag-connect ng TV papunta ng signal receiver (cable)	2.50	Poor
Grand Mean		2.93	Poor

Table 3 indicated students' knowledge of gadgets usage and mobile phone has the highest grand mean among the gadgets listed in the choices, which is 3.91 % and interpreted as "good". Next on the list is Portable TVs which 3.80% and interpreted as "good" also. Tablet with 3.38 % are inferred as "average" followed by television with 2.93% and laptop with 2.29% both "poor" interpretation.

Generally, those gadgets with a high in mean are those found available at home however, the gadgets with the lowest mean are those with its number limited based on Table 2. Therefore, the knowledge of the students in digital gadgets usage is based on the availability of the gadgets at home (refer to Table 2 and 3).

Table 4. *Academic performance in Information Communication Technology (ICT) n=60*

Indicator	Mean	Interpretation
Academic Performance in ICT	80.20	Approaching Proficiency

<sup>a</sup>Interpretation under DepEd Order #73 s.12

Table 4. presented the mean of performance in Information Communication Technology (ICT). The table shown that the mean total grades of students in ICT is 80.20 % and the interpretation is "Approaching Proficiency". It implies that their knowledge of ICT is "approaching" based on the interpretation of DepEd Order #73 s.12.



Table 5. Correlation between students' demographic profile and their academic performance in ICT

		Parent's Income	Mother Educational Attainment	Mother Educational Attainment	Occupation	Gadget Availability	Academic Performance
Parent's Income	Pearson Correlation	1	.575**	.189	.018	-.199	.369**
	Sig. (2-tailed)		.000	.148	.894	.127	.004
	N	60	60	60	60	60	60
Mother Educational Attainment	Pearson Correlation	.575**	1	-.035	.215	-.091	.341**
	Sig. (2-tailed)	.000		.788	.099	.491	.008
	N	60	60	60	60	60	60
Father Educational Attainment	Pearson Correlation	.189	-.035	1	.014	-.105	.145
	Sig. (2-tailed)	.148	.788		.918	.425	.268
	N	60	60	60	60	60	60
Occupation	Pearson Correlation	.018	.215	.014	1	.023	.078
	Sig. (2-tailed)	.894	.099	.918		.862	.551
	N	60	60	60	60	60	60
Gadget Availability	Pearson Correlation	-.199	-.091	-.105	.023	1	-.024
	Sig. (2-tailed)	.127	.491	.425	.862		.858
	N	60	60	60	60	60	60
Academic Performance	Pearson Correlation	.369**	.341**	.145	.078	-.024	1
	Sig. (2-tailed)	.004	.008	.268	.551	.858	
	N	60	60	60	60	60	60

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table 5. demonstrated the correlation relationship between student's demographic profile and their academic performance in ICT. According to the data, both parent's income and mother's educational attainment are significant to the academic performance of the respondents on ICT. However, there is no significant correlation has been proven with the father's educational attainment, occupation, and gadgets availability at home. Therefore, parent's income and mother's educational attainment have an impact on the academic performance of the respondents in Information Communication Technology (ICT) while father's educational attainment, occupation, and gadgets availability at home have no effect.

Table 6. Correlation between students' knowledge in digital gadgets usage and their academic performance in ICT

		Mobile Phone	Laptop	Tablet	Portable TV	TV	Academic Performance
Mobile Phone	Pearson Correlation	1	.357**	.430**	.697**	.458**	.615**
	Sig. (2-tailed)		.005	.001	.000	.000	.000
	N	60	60	60	60	60	60
Laptop	Pearson Correlation	.357**	1	.313*	.157	.587**	.370**
	Sig. (2-tailed)	.005		.015	.231	.000	.004
	N	60	60	60	60	60	60
Tablet	Pearson Correlation	.430**	.313*	1	.138	.241	.429**
	Sig. (2-tailed)	.001	.015		.294	.063	.001
	N	60	60	60	60	60	60
Portable TV	Pearson Correlation	.697**	.157	.138	1	.398**	.580**
	Sig. (2-tailed)	.000	.231	.294		.002	.000
	N	60	60	60	60	60	60
TV	Pearson Correlation	.458**	.587**	.241	.398**	1	.541**
	Sig. (2-tailed)	.000	.000	.063	.002		.000
	N	60	60	60	60	60	60
Academic Performance	Pearson Correlation	.615**	.370**	.429**	.580**	.541**	1
	Sig. (2-tailed)	.000	.004	.001	.000	.000	
	N	60	60	60	60	60	60

\*\* Correlation is significant at the 0.01 level (2-tailed).

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

Table 6. Yield concrete result of Correlation between student's knowledge in digital gadgets usage and their academic performance of Information Communication Technology (ICT). All digital gadgets listed have a significant impact to the academic performance of the respondents on Information Communication Technology (ICT). It implies that knowledge in digital gadgets usage greatly affects the performance of the pupils in Information Communication Technology (ICT). This result was also exposed in the study of Monserate

(2018), which concluded that students; computer literacy positively influences their academic performance.

## Conclusions

Based on the findings of this study, it is determined that family income and mother's educational attainment are significantly correlated. These two indicators greatly affect the academic performance of the students in Information Communication Technology (ICT). Furthermore, student's knowledge of all digital gadgets listed in this study are all significant correlated. It implies that digital gadget usage has a huge impact on their academic performance in ICT.

Based on the findings and conclusion drawn in this study, the following recommendation are made:

School must have additional computer packages including other digital gadgets for the students to use regularly.

Parents must be subjected to training or workshop on digital gadgets usage.

Digital gadget usage must be taught and integrated in all subject areas.

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