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Determinants of Technology for Education, Entrepreneurship, Employment, and Economic Development (Tech4ED) Adoption

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Acceptance Page

This thesis titled ***DETERMINANTS OF TECHNOLOGY FOR EDUCATION, ENTREPRENEURSHIP, EMPLOYMENT, AND ECONOMIC DEVELOPMENT (TECH4ED) ADOPTION*** *is hereby accepted by the Faculty of Information and Communication Studies, U.P. Open University, in partial fulfillment of the requirements for the degree Master of Development Communication (MDC)*

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Biographical Sketch

The author, Maira Geneva Manalo Wallis-Nuarin, was born on February 16, 1987 in San Pablo City, Laguna. She is the second daughter among five children of Mr. Santiago W. Wallis and Mrs. Filipina M. Wallis.

Her mother belongs to the ethno linguistic group Tagalog from San Pablo City Laguna, while her father hails from Tabuk City, Kalinga. She grew up in Philex Mines located in Padcal, Tuba, Benguet . Her father retired as a mine foreman under Philex Mining Corporation.

She took her primary and secondary education at Philex Mines Elementary School and Saint Louis High School- Philex, respectively. In 2004, she was admitted at the University of the Philippines Baguio under Bachelor of Arts in Communication, major in Journalism and minor in Broadcasting.

She is a media practitioner for 12 years now. She first joined ABS-CBN Baguio in 2008 as a field reporter, elevated as news desk and news chief. She was also given the opportunity to handle different program-based positions from host/anchor to executive producer/director. Sadly, she was among the thousand employees of ABS-CBN, who were retrenched due to the non-renewal of the company's franchise.

To continue her passion and the spirit of public service, she and her former colleagues established Regional Network Group or RNG Luzon. They continue to serve the Filipinos by providing news and information online.

Currently, she is also a lecturer at her alma mater, UP Baguio. She is fully committed to cap the students with the skills they need to face the real world.

She was trained to be a storyteller and she would love to hear your stories too.

Acknowledgement

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Dedication

First of all, I would like to dedicate this study to the Supreme Being above, who gave me strength, wisdom and kept the faith in me despite the odds.

I wholeheartedly dedicate this study to my husband, Ruben V. Nuarin Jr; parents, Santiago and Filipina Wallis; sisters Milcah Grace and Martha Glorie; and brothers Mark Gideon and Miel Godsent . I will always appreciate the support they had given me throughout the whole process.

This output is also dedicated to the former employees of ABS-CBN Regionals. ABS-CBN Baguio had been a home for me for more than a decade. ABS-CBN had given me opportunities far beyond my expectations and I am truly honored and blessed to have had the chance to work for this company.

Finally, I dedicate this work and give special thanks to a former colleague and friend, Jay Martin; and my adviser, Dr. Benjamina Paula Flor for the words of encouragement, patience in editing and proofreading my drafts and never giving up on me.

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ABSTRACT

Three hundred thirteen residents of Barangay Poblacion, Tadian, Mt. Province were surveyed to identify the determinants of adopting Technology for Education, Entrepreneurship, Employment, and Economic Development (Tech4ED) project. This project is a strategy to empower the Filipinos in the countryside through innovative digital inclusion towards sustainable development by creating knowledge hubs to promote digital literacy, open opportunities for the underserved and marginalized towards improved quality of life and a more competitive Philippines. Tech4Ed has 10 target sectors: Out-of-School Youth and Adults; Educators; Students; People with Disabilities; Women; Senior Citizens; Overseas Filipino Workers and their families/relatives; Entrepreneurs; Indigenous People; and Farmers and Fisherfolk. However, of the 113 respondents surveyed in one of the 3,381 Tech4ED centers in the Philippines, only 84 (27%) were familiar with it which then formed part of the study. Premised on the Technology Acceptance Model (Davis, 1989), the study determined effects of the external factors (demographic profile, computer self-efficacy, and facilitating conditions (i.e., Internet connectivity, accessibility, information dissemination, and skills training) to the perceived usefulness (PU) and perceived ease of use (PEOU); and the influence of PU and PEOU to the behavioral intention of the respondents to use Tech4ED. Using descriptive statistics, results showed that both PU and PEOU influenced the behavioral intention of the respondents to use Tech4ED. Of the 84 respondents, 65 agreed with the statement: "using Tech4ED would improve my job/academic performance" with 10 who strongly agreed or an aggregate of 75 respondents. Majority of the respondents (76/84) also agreed that learning to use Tech4ED would be easy. Both PU and PEOU were influenced by the demographic profile and computer self-efficacy of the respondents. On the contrary, PU and PEOU were not affected by the facilitating condition because the respondents used and still intend to use Tech4ED in the next days despite the problems that they encountered. However, these need to be addressed to encourage more people to use the system. Overall, the study revealed a low utilization rate of the Tech4ED project in Barangay Poblacion.

Chapter 1

INTRODUCTION

Rationale and Background of the Study

While the Philippines fares relatively poor in Information and Communication Technology (ICT) access and use, the government continues its strategic vision to ePhilippines, "where citizens have access to technologies that will provide quality education, efficient government service, greater source of livelihood, and a better way of life" (Reyes, n.d, p. 3).

In 2014, the Department of Information and Communication Technology (DICT) launched a project called Tech4ED which stands for Technology for Education, Employment, Entrepreneurship, and Economic Development. Its trust is to empower the Filipinos in the countryside through innovative digital inclusion towards sustainable development by creating knowledge hubs to promote digital literacy, open opportunities for the underserved and marginalized towards improved quality of life and a more competitive Philippines. This is an evolution of the Community eCenter or CeC which was established in 2004. Tech4Ed has 10 target sectors: (1) Out-of-School Youth and Adults; (2) Educators; (3) Students; (4) People with Disabilities; (5) Women; (6) Senior Citizens; (7) OFWs, their families/relatives; (8) Entrepreneurs; (9) Indigenous People; and (10) Farmers and Fisherfolk. The project has five original segments or platforms: eGovServ, eAssist, eEduSkills, eAgri, and eMarketPlace. In 2018, three new segments were made available in the Tech4ED: Rural Impact Sourcing eHealth and Gender and Development (GAD). As

of August 28,2019, there are 3,381 Tech4ED centers established in all the provinces in the Philippines.

Several literatures had been done linking ICTs to development, especially in the rural communities. According to Stuart Mathison (n.d), who did a study under the The Foundation for Development Cooperation, ICT is a tool for poverty reduction when it is applied to meet the information and communication needs of the poor or "bridging the digital divide." This is supported by Gerstr and Zimmerman (2003). For them, ICTs in poverty reduction is not limited to reducing income, instead, "poor people need among other things affordable access to information that is vital to their livelihood." Greenberg (2005) also explained in his study the application of ICTs in communication and community access, education, livelihood, healthcare, and government. Dr. Sugatha Mitra's "Hole in the Wall" Project, on the other hand. proved the impact of ICT on education.

Though ICTs have positive impacts in a community, there are many challenges that need to be addressed like the adoption or acceptance of the technology to beneficiaries. Few studies attempted to analyze ICT adoption in several fields like education and agriculture. The study of Mariano et.al (2012) investigated the adoption rate of rice farmers in the Philippines to integrated crop management practices. The rate has been low despite the desirable impacts of the new rice technology. Factors affecting the adoption rate of the farmers include education, machinery ownership, capacity-enhancement activities, and profit-oriented behavior. Thus, the government should provide field demonstrations and training to educate beneficiaries on the possible opportunities that the new technology could bring.

On the other hand, Daling (2018) concluded that ICT literacy of teachers, Internet inaccessibility, and availability of ICT equipment affected the educator's attitude towards the adoption of ICT. Similarly, Garcia (2017) on eLearning technology adoption particularly the Learning Management Systems (LMS) concluded that Internet connectivity experience and social media were the first and second factors that influence acceptance of students.

There was no formal study conducted but implementers of the CeC program had also observed low utilization rate due to connectivity, lack of coordination, and popularity of Internet cafes. Like CeC, since its launching, no study has been done on Tech4ED adoption in the Philippines. Among the pioneer Tech4ED centers in the country, one was established in Barangay Poblacion, Tadian, Mt. Province in April 2016. Hence, the purpose of this study was to investigate the determinants of Tech4ED adoption among the residents of Barangay Poblacion, Tadian, Mt. Province framed under the Technology Acceptance Model (TAM). This model has been widely applied to predict system usage and technology adoption. It has two main determinants that influence people's attitude to accept or reject the information technology. First, is the perceived usefulness, which is defined "as the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). Second, is the perceived ease of use, which is defined as "the degree to which an individual believes that using a particular system would be free of physical and mental effort." These two determinants are affected by external factors. Results of the study are expected to provide recommendations to DICT and at the same time establish what factors would influence adoption of an ICT intervention as a communication tool for development.

Statement of the Problem

As of August 2019, there are 3,381 Tech4ED centers operating in the country with only 139,796 registered platform users (Dean, 2019). This is only .13 % of the Philippines' 111 million total population (Baclig, 2021). The establishment of Tech4ED hopes to bring inclusive growth and poverty reduction by providing grassroots development through access to information, communication, technology, government services, skills training, job markets, and business portals (DICT, 2018) The government has been spending a lot for this project. In 2015, the allocation for the Tech4ED project was roughly Php 50 million (Galolo, 2015). In 2017, the project used Php 22 million (Businessmirror, 2017). Last year, its budget allocation was Php 363 million but experienced a budget cut this year to Php 150 million (Senate, 2020). Hence, it is important to find out the adoption level of residents in far-flung areas like Tadian to ensure that Tech4ED's purposes are truly realized to establish that ICT access and literacy can indeed propel development. Thus, the study generally aimed to answer the general question: What are the determinants of Tech4ED adoption among the residents of Tadian. Mt. Province?

Specifically, it sought to answer the following questions:

1. What is the attitude of the residents towards Tech4ED based on perceived usefulness?

2. What is the attitude of the residents towards Tech4ED based on perceived ease of use?

3. What is the relative influence of the external factors on the perceived usefulness, perceived ease of use and behavioral intention to use Tech4ED?

a. Demographic profile (age and status);
b. Computer Self-Efficacy;
c. Facilitating Conditions; and

4. Do the residents intend to use Tech4ED?

Objectives of the Study

In general, the study aimed to determine the determinants of Tech4Ed adoption among the residents of Tadian. Mt. Province.

It specifically sought to:

1. Find out the attitude of the residents towards TECH4ED based on perceived usefulness,
2. Assess the attitude of the residents towards Tech4ED based on perceived ease of use,
3. Identify the relative influence of the external factors on the perceived usefulness, perceived ease of use, and behavioral intention to use Tech4ED and;
4. Ascertain the residents' behavioral intention to use Tech4ED.

Importance of the Study

Results of this study will provide insights on the benefits and measures to improve Tech4ED. It could also shed some light on the challenges of the project that need to be addressed. The findings will inform DICT on the barriers and enhancers

on the use of Tech4ED and will enable them to identify mechanisms to ensure its successful use. The conclusion of the study will also be used as guide to policymakers, decision makers, and other stakeholders to make well- informed decisions about how to improve on the implementation of the project, if warranted. The results of the study could be part of the training programs of center managers in order for them to intensify the promotion of Tech4ED for better utilization. Based on the data as of August 2019, there are only 139, 796 registered platform users (Dean, 2019). This is only .13 % of the country's total population. Though not the springboard of the research, but the findings of the study could challenge the usefulness of Tech4ED in bringing about social change.

The study also aimed to contribute to the field of development communication by identifying the factors that would influence adoption of ICT with communication as lens. Knowing these determinants could establish how ICTs as tools for development can be better communicated and designed. This will also explain and validate the Technology Acceptance Model (TAM) of Davis in terms of technology use.

Scope and Limitations of the Study

Due to the geographical locations of the target population, the sample size determined through Yamane's formula was not completely achieved. From the target sample size of 355, the questionnaires were distributed to only 313 respondents. For the same reason, convenient sampling was employed in selecting the respondents.

Since the purpose of this study was to identify the determinants of Tech4ED adoption among the residents of Tadian, Mt. Province, only those who were familiar with the project were considered in the study which turned out to be low. Only 1 out of 4 or 27 percent (84 out of the 313) of residents were familiar with Tech4ED. Thus, a focus group discussion and document review or analysis were conducted to substantiate the survey results. FGD participants included teachers and students of the Tadian School of Arts and Trades and DepED representatives, who have immediate access to the center. Manual, toolkits, eNewsletter, and eMagazine released by CICT and DICT were among the documents that were analysed.

The study applied the two original and major constructs of TAM: perceived usefulness (PU) and perceived ease of use (PEOU). The study used the demographic profile, computer self-efficacy and facilitating factors as external factors influencing the TAM constructs. The demographic variables included were age and status (student, employed, self-employed, unemployed) of the respondents, while the facilitating conditions included internet connectivity, accessibility, information dissemination and skills training.

Chapter 2

REVIEW OF RELATED LITERATURE

ICT defined

Information and Communication Technology or ICT provides access to information through telecommunication. Blurton (1999) defined ICT as a "diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information." This includes internet, wireless networks, cellphone, and other communication mediums (Anonymous, 2010) .

ICT application

Dr. Sugatha Mitra is best known for his "Hole in the Wall" Project in the urban slum of New Delhi, India, which started in 1999 (Mitra, 2012). He had watched the children teach themselves and others on how to use the machines and gather information. This project "demonstrates that an environment that stimulates curiosity can cause learning through self-instruction and peer-shared knowledge" (NPR/TED Staff, 2013, para.3). In other words, children learned how to use the computer by simply giving them access. Currently, there are 250 holes in the wall units in India benefitting children from 5 to 14 years old. Dr. Mitra explained that children love the learning system because it is free and full of "edutainment" (education and entertainment). Children have the freedom to use it without fear or adult intervention (India School News, 2016) and when working in groups, they do not need to be taught because they teach each other (Mitra, 2012). Mitra came up with a qualitative

and quantitative assessment of the learning curve of the children. He found that within three months of use, the children could do the following tasks (Mitra, 2012).

1. basic computer navigation functions, such as click, drag, open, close, resize, minimize and menu selection;

2. drawing and painting pictures on the computer;

3. loading and saving files;

4. downloading and playing games;

5. running educational software and other programs;

6. playing music and videos, and viewing photos and pictures;

7. surfing the Internet, if a broadband connection is available;

8. setting up email accounts;

9. sending and receiving email;

10. using social networking programs, such as chat rooms (AIM, Google Chat, etc.), Skype and Facebook;

11. simple troubleshooting, such as fixing speakers that are not playing sound; and

12. downloading and playing streaming media.

While it is still referred to as the Hole in the Wall, Dr. Mitra developed it to a Minimally Invasive Education or MIE which he believes should be part of the school's

curricula. Teachers and field observers noticed that MIE led improvements in children's enrolment, attendance, and performance on school examinations (Mitra, 2012).

ICT in education has been used as an object which prepares students for future occupation and social life; as an assisting tool in conducting research and assignments; as management of learning for record keeping and database; and as a medium for teaching and learning (Majumdar, 2012).

In technologically advanced countries like Korea, eLearning has been implemented in universities. Students adopt eLearning because they believe that this is beneficial for future job preparation and they do not want to fall behind other students (Park, 2009, 150).

> *"ICTs are influencing employment both as an industry that creates jobs and as a tool that empowers workers to access new forms of work, in new and more flexible ways."*
>
> - Chris Vein, World Bank Chief Innovation Officer for Global ICT Development.

ICTs are also creating new job opportunities and could help address world problem on unemployment. An example is the Grameenphone Company in Bangladesh, where the mobile technology was acquired through a small loan from the bank. In the mid-1990s, Bangladesh had the lowest tele densities or telephone density in the world with a ratio of one phone per 100 inhabitants. Based on an ADB's report, by the end of 2011, Grameenphone's mobile services covered 99% of the country's population. It has contributed substantially to the business, economic, environment, social and health development and provided livelihood to thousands who serve as phone operators (Flor, 2001)

Aside from phone operators, ICT provides various types of jobs from Chief Information Officer in big enterprises or government agencies to computer shop operators since the early 90s. Other vocational opportunities include the following (Michael & Samson, 2014): 1. Networking; 2. Programming; 3. Repairing and maintenance; 4. Computer sales; 5. Phone sales; 6. Parts and accessory sales; 7. Document processing; and 8. Phone calls, etc.

The US Department of Labor projected a 2 % annual increase in the overall ICT- related jobs. It presented a job growth outlook of ICT jobs from 2012-2022 (University of Kentucky, n.d. para 3).

Job	Growth outlook 2012-2022
Information Security Analysts	37%
Medical Records and Health Information Technicians	22%
Web Developers	20%
Network and Computer Systems Administrators	12%

ICT-based businesses were also developed like document processing centers, cybercafé, computer training centers, computer services and repairs, handset services and repairs, internet, programming, cable and satellite TV installations, etc (Michael & Samson,2014).

ICT Infrastructure and Tech4ED in the Philippines

The Philippines continues to improve and update its ICT infrastructure (DICT,2020). Flor (2001) acknowledged the importance of ICT in transforming education along with economic and social processes. In the Philippines, ICT4E or

the inclusion of ICT for education is one of the trusts of the Basic Education Sector Agenda. One of the proponents of ICT4E argued that ICT is now a necessity in today's teaching-learning environment. The creation of the National Framework Plan for ICT's in Basic Education in 2005, recognized the potential benefits of integrating ICTs in the educational system. Flor (2001) identified current ICT4E initiatives in the Philippines which include the DepEd Computerization Program. Bonifacio (2013) also identified ICT as an effective learning tool in setting the curriculum standards for K-12.

In 2004, the defunct Commission of Information and Communications Technology or CICT launched 100 Philippine Community eCenters or CeCs, which had been defined as "a self-sustaining shared facility providing affordable access to ICT-enabled services and relevant content. It serves as a conduit for efficient delivery of government and other services and potent tool for empowerment and participation of underserved communities in development" (CICT, 2008). The implementation of the Philippine CeC program was under the 2004-2010 Philippine Medium Term Development Plan, which supported the then Millennium Development Goals (MDGs) now the Sustainable Development Goals (SDGs) on poverty reduction through the ease of access to information on business, employment opportunities in the country and abroad and provisions of capability for online placement. The project also supported the MDGs on universal primary education through the CeCs electronic delivery of updated information which were unavailable in library holdings. This improved the quality and delivery of knowledge references. It focused on the unserved, underserved and vulnerable groups especially children, women and senior citizens. The first goal of the project is to provide affordable and reliable Internet connectivity to all CeCs (CICT, 2008).

The CeC project had been relevant in giving the Ifugao Rice Terraces, a UNESCO World Heritage Site, a new life. It provided the impetus for eco-tourism and promotion of Ifugao Culture. As a result, the internet marketing effort had lured more tourists and greater earnings for the province and residents. It was also very useful in the Municipality of Upi, Maguindanao, which had no internet service provider and limited telephone and mobile carrier services. The town also had no public library and information resources in public schools were limited and obsolete. News and other media services like newspapers arrived very late in the town. With the advent of CeC, the retrieval of information was expedited and phone costs were reduced. The residents took advantage of the CeC's video and voice chat services to communicate with their loved ones abroad. The Local Government Unit or LGU were able to communicate more easily with funding agencies and other local and national agencies through the internet. While students, were able to interact with other students and resource speakers around the world. They were provided unlimited access to wide array of updated references in the World Wide Web. Furthermore, CeC gave the residents of Upi accessed to fresh local, national and foreign news and greater business opportunities by being able to market the products internationally. Indeed, the establishment of CeC in Upi, Maguindanao helped elevate its status from a third-class to a first-class municipality (CICT, 2008).

However, the history of CeCs in the Philippines started with the Multipurpose Community Center (MCTs) which the Department of Science and Technology organized. Two centers were launched in 1999 in Agusan Del Norte and Lanao Del Norte. "The centers were one-stop shops which provided the communities with internet access, a public calling station, reading, learning and resource center to address the information needs of the communities." (CICT, 2008). Along with this

were other ICT initiatives such as the Community Information Centers in Cebu established by the World Corps Philippines, which aimed to provide social preparation, training, telecenter set-up, technology solution, mentoring, and community integration; eLGU; eBarangay; and Tulay Project of the Overseas Workers Welfare Administration.

In 2014-2015, the CeC program had evolved into the Tech4ED project, which will not only benefit the educational system but aimed to provide various services to different sectors. The basis of the establishment of CeCs and Tech4ED Centers was the 2003 World Summit on the Information Technology Society (WSIS) Geneva Plan of Action which states that: (CICT, 2008, p. 15)

> *Governments and other stakeholders, should establish multi–purpose community public access points, providing affordable or free-of-charge access for their citizens to the various communication resources, notably the Internet.*
>
> - 2003 WSIS Geneva Plan of Action
> Action Line C3 "Access to Information and Knowledge", Paragraph 10, Item D

With its evolution comes the introduction of the different platforms or segments containing relevant ICT contents and services. The project has five original segments when it was launched in 2014 (Figure 1). In 2018, three news segments were added (Figure 2).

The eGovServices segment provides direct government services to rural communities through the Tech4Ed Centers. This segment is an aggregation of various content and services from other government agencies, making the Tech4Ed Platform a one-stop shop for selected government services.

The eAssist segment provides learning and continuous skills development opportunities towards digital inclusion for special sectors such as women, People with Disabilities (PWDs), senior citizens, Overseas Filipino Workers (OFWs) including their families and relatives, Career shifters, and teachers

The e-Agri segment aims to use ICT to enhance and localize farm technologies to increase productivity and reduce cost for farmers and fisherfolk.

The eMarketplace segment aims to increase the market reach of micro, small and medium enterprises (MSMEs) beyond their immediate community for better economic growth and

The eEduSkills segment delivers learning and skills contents to address the education divide.

Figure 1: Tech4ED's five original segments

The Gender and Development (GAD) segment provides contents on women empowerment, policies for protection of women, skills enhancement.

The Rural Impact Sourcing (RIS) segment aims to promote ICT-enabled jobs, online freelancing and digital career. It contains modules on foundations of online freelancing, client management, and online marketing.

eHealth segment provides access to basic health information and access to available and existing Philippine-based health- related online resources including international and global healthcare organizations.

Figure 2: Tech4ED'S three new segments introduced in 2018

Based on the data released by DICT, as of August 2019, 3381 Tech4ED centers are operating nationwide with 139,796 registered platform users. All of the 81 provinces in the Philippines are already covered.

Tech4Ed center is defined as:

> *A self-sustaining, shared facility providing access to ICT-enabled services and relevant content. It serves as a hub for the unserved or underserved communities, and the marginalized sectors so they can access ICT services, eGovernment service, non-formal education, skills training, eHealth services, job markets, and business portals. It enables the citizens to upgrade their ICT literacy level , acquire skills to gain employment , avail of government services, increase their knowledge and communicate with their families overseas or with individuals in the same field. (DICT,2018,p16.)*

The Tech4ED project has a variety of center models to provide access to ICT services to everyone in the community or a specific group of people. The current Tech4ED center models are:

A. Local Government Units (LGU): This is a Tech4ED model that is housed inside a city, municipal or barangay hall;

B. Schools: This is a Tech4ED model that is housed in schools;

C. Libraries: This model offers Tech4ED platform contents and services for additional reference and resources;

D. Negosyo centers: This model provided ICT services to *MSMEs* for income generation and wider market reach.

E. Farmers IT Services (FITS) Center: This model provides ICT services to farmers;

F. National Government Agencies (NGA): This model is for public use and serve as a complementary service to their existing initiatives;

G. Non-government Organization (NGO): This model offers Tech4ED platform contents and services with like-minded organizations working towards the goal of developing communities while promoting ICT;

H. Private Sector: Private partners with legal entities are tapped to host Tech4ED centers in the absence of publicly owned spaces;

I. DICT Regional and Provincial Trainings Centers: This center model is open to the public and may be used as training facility;

J. Rural Impact Sourcing (RIS) Hub: This model provides technical training to increase capabilities of the people to land ICT-related jobs;

K. Bureau of Jail Management (BJMP): This model provides ICT access to persons-deprived of liberty; and

L. Mobile Tech4ED centers: This model is able to go around specified areas.

Based on the data, most TECH4ED Centers are established in schools with 2060. 823 centers were established in the premises of the LGU, 218 centers in libraries, 72 in Negosyo Centers, 67 in DICT Regional and Provincial Trainings Centers, 44 centers were opened by private sectors, 36 in NGAs, 28 in RIS hubs, 21 in FITS centers, and 12 were opened by NGOs. There are five mobile Tech4ED

centers serving the remote communities and 15 centers were opened inside BJMP (Dean, 2019).

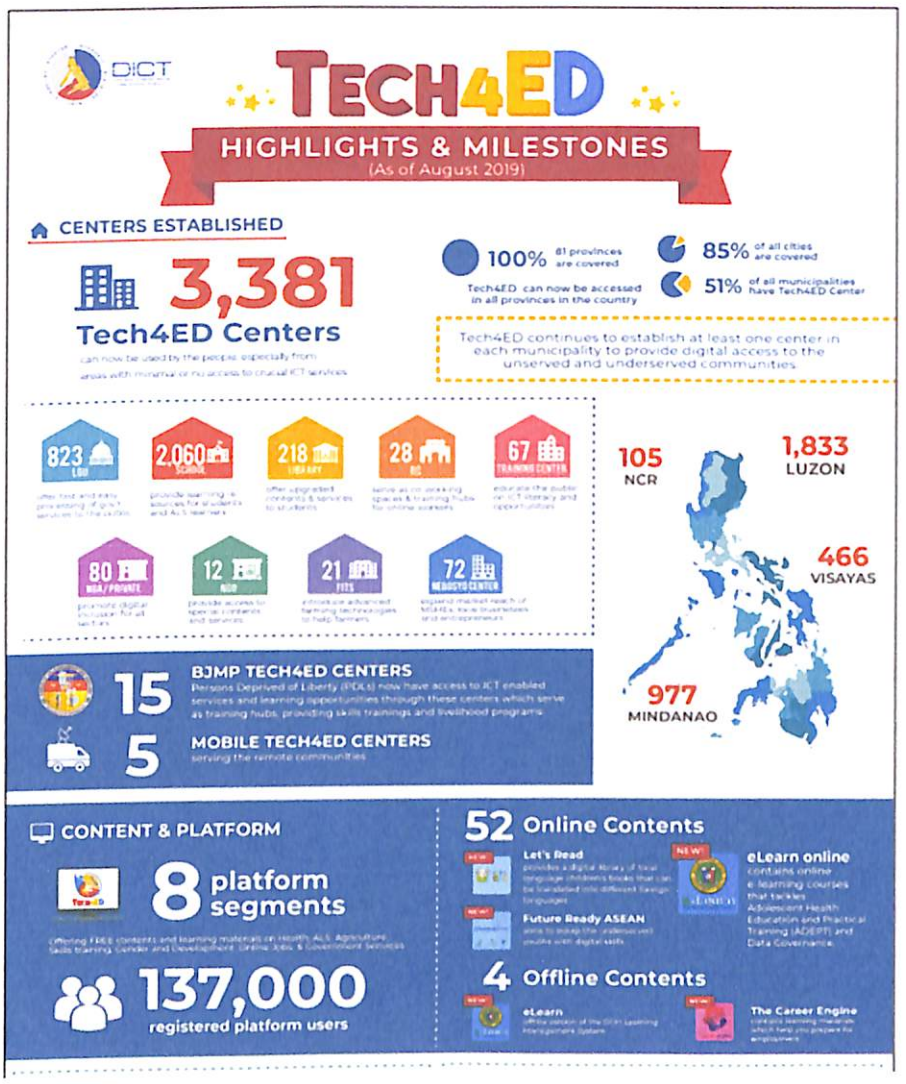


Figure 3: Update on Tech4ED Centers and Registered platform users as of August 2019 (image courtesy of DICT)

Among the pioneer Tech4ED centers in the country include those which were opened in Mt. Province in April, 2016: 1) Mt. Province General Comprehensive High School in Bontoc with 9 registered Tech4Ed users; 2) Tadian School of Arts and Trades in Tadian with 114 registered Tech4Ed users; and 3) Mt. Data National High School in Bauko with 53 registered Tech4Ed users.

Tech4ED has 10 target sectors: (1) Out-of-School Youth and Adults (2) Educators (3) Students (4) People with Disabilities (5) Women (6) Senior Citizens (7) OFWs, their families/relative (8) Entrepreneurs (9) Indigenous People (10) Farmers and Fisherfolks.

Based on the data presented by online news agency Rappler, in March 2017, students compromise a large chunk of users.

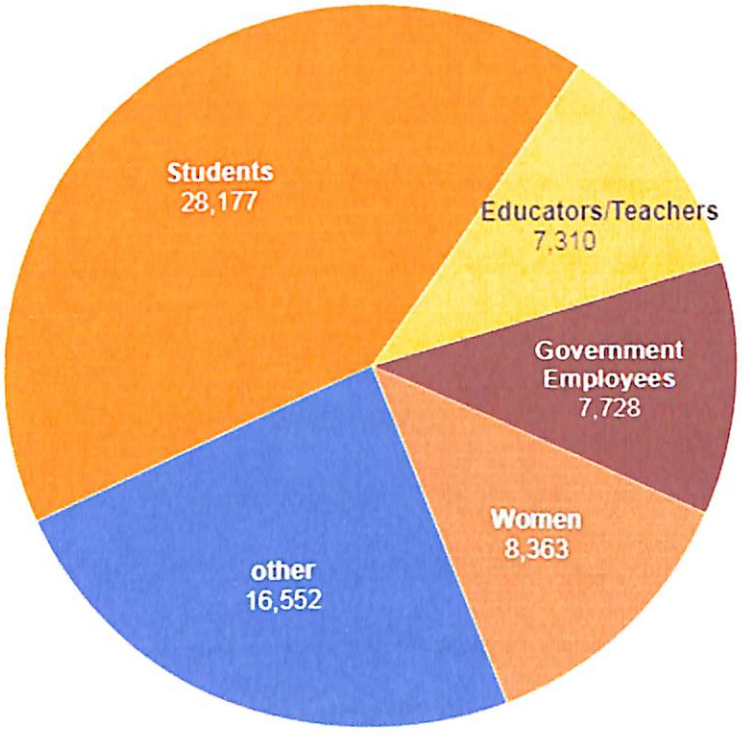


***Figure 4: Tech4ED user based** (image courtesy of Rappler)*

Barriers and determinants of ICT adoption

Despite the CeC's successes, several concerns were identified. Connectivity and power were the most common problems recognized with regard to

infrastructure. Political, manpower/human resources, financial, technical, policy perspective and peace and order were also identified. Information discrepancy and accuracy were noted which had an implication on access. Low utilization due to lack of coordination and social acceptance of the project was observed. Inadequate level of literacy of target users and unpopularity of some CeCs compared to Internet Cafes were also deterrents to meaningful participation of communities (CICT, 2008).

Vankatesh et.al (2003) identified facilitating conditions as one of the determinants of ICT adoption. It has been defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system. These include the "resources necessary to use the system, knowledge necessary to use the system, and a specific person or group that is available for assistance with system difficulties" (Vankatesh et. al., 2003, p. 460). Garcia (2017), and Peltier and Youssef (2015), identified internet connectivity as one of the necessary resources to use an ICT. Garcia (2017) explained that it was easier for students to use the Learning Management Systems or LMS when the internet connection is fast. While Alampay's (2006) and Aramilde et. al (2015), identified accessibility and location of ICT as leading predictors of ICT use. In their study, they concluded that if a user finds it easy locating ICT resources, the tendency of using that ICT is high.

Flor (2008) and Bonifacio (2013) pointed out that technical issues are most common in the integration of ICT specifically in education. Flor (2008) summarizes this into three: readiness, cost-effectiveness, and standardization:

Readiness: This is reflected by the lack of facilities like computers and utilities such as electricity and landline. In 2012, according to DepEd, 95 % percent of public high schools have computer labs but only 57% have access to the internet. While only 4 % of public elementary schools have e-Classroom package. (Macasaet,2013)

Cost-effectiveness: Cost of bandwidth and hardware remain high.

Standardization: This is the decision to be done in choosing the most suitable software between open source and propriety software.

South Africa Country Report also acknowledges the role of ICT in enhancing the livelihood of the rural poor especially in doing business. However, the report showed that many of the unsuccessful projects could be attributed to human factor. Availability, affordability, and accessibility were among the problems, which could be solved with the concerted effort of the government and non-government organizations (Fourie, 2008).

Gerstr and Zimmerman (2003, p. 9) also identified the factors mentioned above like connectivity *(Are the services available?)* and affordability *(Can potential clients afford the access?)*, but they also included capability (*Do the potential users have the skills required for access?)* in the list of factors that should be considered when using ICTs.

Almekhlafi and Almeqdadi (2010, p. 165) believed that when it comes to ICT adoption in the academe, professional development of teachers in technological skills and competencies are needed through the following recommendations:

1. Provide workshops on technology integration;
2. Provide teachers with appropriate technology;
3. Provide teachers with incentives and awards for outstanding technology integration in their classrooms;
4. Provide teachers with some release time so that they can plan effectively for technology integration in teaching and learning;
5. Explore the use of technology in classrooms covering all school levels, including public and private schools;

6.Investigate the effect of technology integration on students' achievement and attitude; and

7.Investigate technology integration in relationship to curriculum goals and outcomes.

Alqaralleh et.al (2020) study pinpointed the importance of providing information about a new ICT by emphasizing the usefulness of that system to the people. It should be delivered in an easy, clear and understandable way. Adoption of a new technology requires learning new skills. Consequently, having general knowledge about a certain technology and its role in task performance is important to technology adoption (Czaja et.al ,2006). Having the needed skills will motivate target beneficiaries or users to use an ICT (Alampay, 2006).

Since the use of an ICT system requires the use of a computer, Czaja et.al (2006) claimed that computer self-efficacy is an important predictor of general use of technology. Campeau and Higgins (1995) defined computer self-efficacy as the capability of an individual to use a computer and other related tasks. Thus, people with lower computer self-efficacy are less likely to use technology in general (Czaja et.al,2006). This argument is consistent with the self-efficacy study of Bandura (1997). Furthermore, John's (2013) study provided evidence that computer self-efficacy significantly influenced perceived usefulness. Thus, the higher the individual's computer self-efficacy, the more he/she perceives an ICT to be useful.

Several research findings also showed that demographic factors can be associated with the capacity to learn and predict the use of ICT resources by individuals. (Aramilde et.al., 2015, Czaja et.al, 2006; Oyedipe & Popoola; 2019). Aramilde et.al. (2015) affirmed previous researches that age influence the use of ICT. In their study, they found out that teachers within the age of 21-40 years were

more capable of using the ICT than the older group. Oyedipe & Popoola (2019) emphasized that age affects the ability to acquire new skills. Thus, younger people are more technologically savvy while older people are not flexible to change. Individuals can also determine their response to ICT use based on their job status. They would see the relevance of using an ICT to effectively handle assigned tasks, duties and responsibilities (Oyedipe & Popoola; 2019).

Theoretical Framework

One of the well-known models used to examine the acceptance and adoption ICTis the TAM). This was developed by Fred Davis in 1985. He developed TAM with two objectives in mind: to improve understanding of user acceptance processes; and provide the theoretical basis for a practical "user acceptance testing "methodology (Davis,1985). It has been used as a model in several studies like e-commerce (Gefen,2003) and e-learning system (Park, 2009).

In his model, Davis explained that the user's motivation to the actual system use is motivated by the attitude of the user towards the system. Davis identified two determinants that influence people's attitude to accept or reject the information technology. First is the perceived usefulness (PU), which is defined "as the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). Second is the perceived ease of use (PEOU), which is defined as "the degree to which an individual believes that using a particular system would be free of physical and mental effort." These two determinants are affected by external factors, which could include any factor such as organizational or social

factors. David defines behavioral intention as the extent to which an individual intends to perform a specific behavior, which is the actual system use (Figure 5).

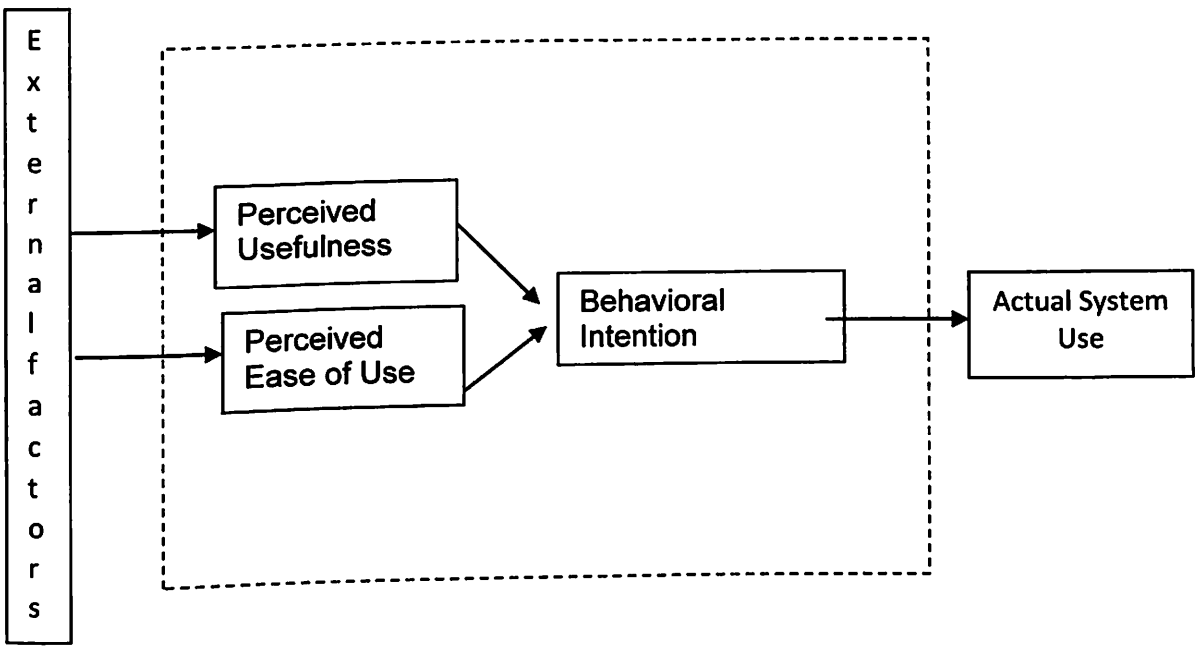


Figure 5: Depiction of the original TAM proposed by Davis (1985)

Davis (1989) originally used the model to examine the reactions of users to electronic mail system and file editor. One-hundred twenty users within the IBM Canada's Toronto Laboratory were given questionnaires to rate the perceived usefulness and perceived ease of use. In a separate laboratory study, Davis took 40 participants from different industries to study the Charter Masterm, which is a menu driven package that creates numerical business graphs; and Pendraw, which allows user to perform free hand drawing (Davis, 1989). They were given one hour to use the systems. Both studies revealed that the perceived usefulness influences the decision of the users than the perceived ease of use. Primarily, users are driven to adopt a system "because of the functions it performs for them, and secondarily for how easy or hard it is to get the system to perform those functions" (Davis, 1989). While David, presented perceived usefulness and perceived ease of use as direct

determinants of behavioral intention to use a system, he emphasized that the usefulness over ease is more prominent. This was later confirmed by other researchers. In a study conducted by Subramanian (1994) on the adoption of voice mail and dial up system, he revealed that perceived usefulness and not ease of use, is a determinant of future usage. The study of Cigdem and Ozturk (2016) and Czaja et.al (2006) also showed that the behavioral intention to use a technology was largely driven by the perceived usefulness. However, Gefen (2000) reiterated that perceived ease of use should not be underestimated in considering the actual adoption of the system. It is an important consideration in advertising marketing and implementing new systems.

Whereas, the study of Garcia (2017), Tarhini et.al (2013) , and Alqaralleh et.al (2020) confirmed that both perceived usefulness and perceived ease of use are two of the strongest determinants of behavioral intention. Garcia (2017) also concluded that perceived ease of use has a significant effect on the perceived usefulness. "When a system is easy to use, it is also perceived as a useful tool" (Garcia,2017,p.127). This result is parallel to the study of Cigdem and Ozturk (2016) in which it is also asserted that when users find the system easy to use, they tend to consider it beneficial or functional.

All the cited literatures were inconsistent with the point of Park (2009), which claimed that perceived usefulness and perceived ease of use have neither significant direct effect on the behavior to adopt a system. His study on the adoption of Korean students to e-Learning concluded that learning to use the internet is easy and the benefits from it are already known to students.

Conceptual Framework

TAM (Davis et al., 1989) forms the foundation of the conceptual framework for this study. Its reliability and validity had been supported by various studies (Tarhini, et.al. 2013; Cigdem and Ozturk, 2016; Garcia, 2017; and Alqaralleh et.al,2020).

The study forwards that both perceived usefulness and perceived ease of use would determine the behavioral intention of the respondents to use Tech4ED, which would lead to its adoption. This means that if the respondents find Tech4ED useful in their daily lives and would help them improve their tasks and performances; and if they would find it less challenging and easy to use, then they would be encouraged to use it often.

Moreover, perceived usefulness and perceived ease of use are influenced by external factors. These external factors were drawn from various literatures such as demographics particularly age and status (i.e. student, teachers, government employees and other sectors), computer self-efficacy and facilitating conditions (internet connectivity, accessibility, information dissemination and skills training).

The study forwards that demographic variables specifically age would determine the cognitive ability of the respondents to assess how easy it is to use Tech4ED and how relevant it is in his/her daily life. In the case of this study, younger people are expected to be more adept in using Tech4ED because they are more technologically savvy while older people are not flexible to change. This means that it is easier for younger people to navigate and use Tech4ED. Being able to use Tech4ED would also help them realize its relevance. The current status (i.e student, teachers, government employees and other sectors) of the respondents is another factor. The individual could determine the usefulness of Tech4ED based on the

specific function, which is most applicable to them. This means that if the individual is among the target beneficiaries of Tech4ED like students and teachers, it would be most useful to him or her.

Computer self-efficacy is another external factor that influences perceived usefulness and perceived ease of use. It was hypothesized that perceived computer self-efficacy or the confidence in one's ability to use a computer would have a positive effect on an individual's judgement about the usefulness and ease of use of Tech4ED. Thus, the respondent who has higher computer self-efficacy is more likely to use Tech4ED; and the more he or she perceives Tech4ED to be useful.

Finally, the study forwards that facilitating conditions which include internet connectivity, accessibility, information dissemination and skills trainings about Tech4ED would influence perceived usefulness and perceived ease of use. It would be easier for the respondents to use Tech4ED if the internet connection is fast. If the people find it easy to locate Tech4ED, then the tendency of using it is high. Providing information about Tech4ED emphasizing on its usefulness would also influence the people to use the system. Adoption of new technologies such as Tech4ED requires learning new skills and these could be acquired through training. This means that if people have the knowledge and proper training on the functions and usage of Tech4ED, they would be motivated to use it regularly.

Figure 6 shows an illustration of the conceptual framework of the study. It explains how the respondent's perceived usefulness and perceived ease of use of Tech4ED directly influence their behavioral intention to use it, which would lead to adoption. The illustration also explains that the identified external factors namely: demographic profile particularly age and status (i.e student, teachers, government

employees and other sectors), computer self-efficacy and facilitating conditions may influence the perceived usefulness and perceived ease of use of Tech4ED.

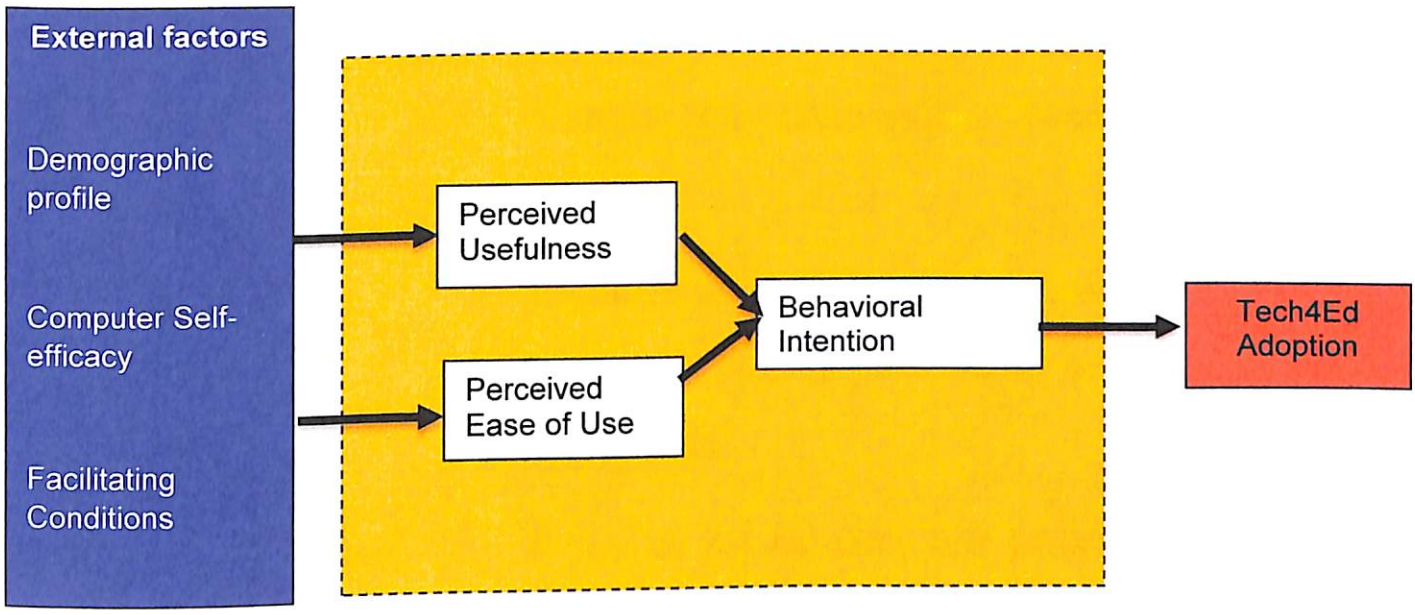


Figure 6: Determinants of TECH4ED adoption

Operational Definition of Terms

Perceived Usefulness

Refers to the degree to which a person believes Tech4ED would help him or her accomplish the tasks more quickly and enhance his or her performance. It was measured through a 4-point Likert Scale. The respondents were asked to determine their level of agreement on the statements- Strongly Agree (SA) 1 - Agree (A)2 - Disagree (D)3 - Strongly Disagree (SD)4

Perceived Ease of Use	Refers to the degree to which Tech4ED is regarded as easy to understand and operate. The respondents were asked to determine their level of agreement on the statements- Strongly Agree (SA) 1 - Agree (A)2 - Disagree (D)3 - Strongly Disagree (SD)4.
Demographic Profile	Refers to age and status *(i.e student, teachers, government employees and other sectors)* of the respondents.
Computer Self Efficacy	Refers to the capability and knowledge of the respondents to use a computer and perform other tasks using the computer. This also refers to the frequency of using a computer. The respondents were asked to determine their level of agreement on the statements- Strongly Agree (SA) 1 - Agree (A)2 - Disagree (D)3 - Strongly Disagree (SD)4
Facilitating Conditions	Refers to the internet connectivity and accessibility of the Tech4ED center; information dissemination and skills training in using Tech4ED. The respondents were asked to determine their level of agreement on the statements- Strongly Agree (SA) 1 - Agree (A)2 - Disagree (D)3 - Strongly Disagree (SD)4

Behavioral intention

Refers to the intention of the users/residents to use Tech4ED in the next days. The respondents were asked to determine their level of agreement on the statements- Strongly Agree (SA) 1 - Agree (A)2 - Disagree (D)3 - Strongly Disagree (SD)- 4

Indicator of research variables

Variables	Indicator	Item
Perceived Usefulness	PU 1	Using Tech4Ed in my job/studies/business/personal use would enable me to accomplish tasks more quickly.
	PU 2	Using Tech4Ed would improve my job/ academic performance.
	PU 3	Using Tech4Ed in my job/studies/business/personal use would increase my productivity.
	PU 4	Using Tech4Ed would enhance my effectiveness on the job/ studies/business.
	PU 5	Using Tech4Ed would make it easier to do my job/studies/business
	PU 6	I would find Tech4Ed useful in my job job/studies/business
Perceived Ease of Use	PEOU 1	I find Tech4Ed easy to use.
	PEOU 2	Learning to operate Tech4Ed would be easy for me.
Computer Self-Efficacy	CSE 1	I know how to use a computer.
	CSE 2	I often use a computer.
	CSE 3	I know how to fix computer problems.
	CSE 4	I know how to look for information online using the computer.
	CSE 5	I know how to produce content in different forms using the computer.
Facilitating Conditions (FC) all	FC 1	The Tech4Ed center is easily accessed by residents.
	FC 2	The facility has good internet connection.
	FC 3	There is a continuous dissemination of information as regards to the Tech4Ed project
	FC 4	There is a training on the use of Tech4ed
Behavioral Intention to Use (BITU) (Tech4ed Adoption)	BITU	I intend to use Tech4ED in the next days.

Chapter 3

METHODOLOGY

Research Design

The study employed a one-shot survey research design. This is a form of non-experimental design which consists of a single observation and involves only one empirical cycle: research question—data collection—analysis—report. This is also considered as the most straightforward type of survey because it is usually administered to a sample of people at a set point in time (Jansen, 2010). It determines the state of knowledge, attitude, and practice of people before and after intervention (Henson,n.d.).

Locale of the Study

This study was conducted in Barangay Poblacion, Tadian, Mountain Province with a total population of 3,126. Among the pioneer Tech4ED centers in the country include those which were opened in Mt. Province in April, 2016. One of which is located at Tadian School of Arts and Trades in Barangay Poblacion, Tadian, Mt. Province.

Sampling Procedure

Convenience sampling was used in selecting the respondents. This is a non-probability sampling method that relies on data collection from population members who are conveniently available to participate in the study (Dudovskly, 2012). Moreover, this is a type of sampling where the first available primary data source will be used for the research without additional requirement. In other words, this sampling method involves getting participants wherever you can find them and typically wherever is convenient. In convenience sampling, no inclusion criteria were identified prior to the selection of subjects. All subjects were invited to participate.

Sample size was computed using the Yamane's Formula (1967) where;

N = the size of the population

e = the error of 5% points

Computation: 3,126[1+3,12690.05) 2]

: 3,126/[1+3216 (0.0025]

: N = 355

Overall, only 313 questionnaires were distributed among the residents. However, only the answers of 84 residents who were familiar with Tech4ED formed part of the study. Therefore, the usable response rate was only 27%.

The participants in the FGD were chosen based on a set of criteria. In this particular study, participants were those who had knowledge and immediate access to the Tech4ED center opened in Tadian Schools of Arts and Trades. The focus group was composed of two representatives from the Department of Education, three teachers, two students and the principal of Tadian Schools of Arts and Trades.

Types of participants	Number n=8
Students	2
Teachers	3
Principal	1
DepED Representatives	2

In choosing the literatures for document review, only the documents which would meet the purpose of the study were selected. Documents containing information about the Tech4ED project and were officially released by the CICT and DICT were used in this study. This is to ensure accuracy and truthfulness of the information. Toolkits, manual, eMagazines and eNewsletters were the type of documents used which were all considered public records. These were obtained from the Internet.

Research Instrument

The instrument utilized in gathering the data was a survey-questionnaire (Appendix A). The first part of the questionnaire determined the demographic profile of the respondents in terms of age and status (*i.e student, teachers, government employees and other sectors)*. The second part of the questionnaire assessed the respondents' computer self-efficacy, their level of agreement to the facilitating conditions, attitude towards the Tech4ED project based on perceived usefulness, perceived ease of use and intention to use Tech4ED. A four-point Likert scale was employed with 1= strongly disagree, 2= disagree, 3= agree and 4= strongly agree.

The standardized test performed was Cronbach's Alpha. This is measuring the reliability or internal consistency. "Reliability is how well a test measure what it should" (Statistic How To, 2014). This shows how closely related a set of items are as a group. According to Hair et. al (2010), the recommended value of Cronbach's Alpha (α) should be above 0.7 (α >0.7).

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Based on the results, all of the scales that represent the TAM constructs appear to have an excellent degree of reliability.

Reliabilty Analysis (n=84)

TAM Constructs	Cronbach's Alpha (α >0.7)	Number of Items
Perceived Usefulness	0.809	6
Perceived Ease of Use	0.78	2
Facilitating Conditions	0.819	4
Computer Self-Efficacy	0.826	5

In the FGD, an FGD guide was used to elicit views and opinions from the participants about the Tech4ED program. The objectives of the FGD were to gain insights on the perception and assessment of the users on the Tech4ED project; and provide confluence of evidence to breed a more credible result.

Data Gathering Procedures

The study was conducted with the use of questionnaire to generate residents' responses on their intention to use and adopt Tech4ED. Focus Group Discussion or FGD and document review were used as triangulation measures to substantiate the results generated in the survey. FGD is defined as a way to gather together people from similar backgrounds or experiences to discuss a specific topic of interest (odi.org.2009). Document analysis or review is a method of evaluating documents-

both printed and electronic in order to elicit meaning and gain better understanding of the topic (Bowen, 2009).

The data collection involved three parts: 1) a survey with 84 conveniently selected respondents, followed by 2) FGD with 8 participants, who were selected based on a set of criteria; and 3) document review of public records officially released by CICT and DICT.

Permission through a letter from the Barangay Captain of Poblacion, Tadian, Mt. Province was sought to gather information from the residents. Upon approval, the researcher floated questionnaires to the residents. During the survey, proper ethical procedures were followed by explaining the objectives of the study and giving an assurance that all their answers will be kept private and will only be used to achieve the research objectives. The respondents gave their verbal or oral consent before starting to answer the questionnaire.

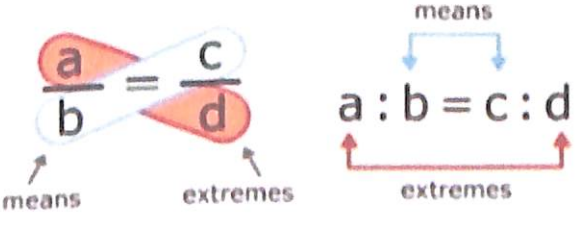
The same ethical protocol was observed for the FGD participants. Permission from the principal of the Tadian Schools of Arts and Trades was also sought. The respondents voluntarily participated in the FGD and gave their verbal consent before the start of the FGD. The discussion was recorded via Smart phone to ensure accuracy of the data collected. The participants were advised that the conversation will be recorded and discarded after analysis and photos will be taken. All gave their verbal consent.

Documents used were selected through extensive research and analysis. The documents were chosen depending on the range of connection to the study. All are considered public records officially released by CICT and DICT, and were downloaded from reliable sources on the internet.

Data Analysis

The data results of the survey were analysed through descriptive statistics, which is a technique that simplify, summarize and describe the data. (Mertler, 2014). It simply describes what is and what the data shows. The data results were presented through ratio, proportion and weighted mean.

1. **Ratio .** The ratio is the comparison of two or more quantities of the same type (Dole and Malcolm, 2002). While comparison of two or more kinds of different quantities are so called the rate. The ratio can be written as a : b, or as a fraction a/b, or as a percentage.
2. **Proportion.** The proportion in comparative terms stated quality of two ratios. Proportion is written a/b = c/d or a:b = c:d (Kershaw, 2014). Algorithm standard to situation of the comparison is a presentation of the equation ratio (Silvestre and Da Ponte, 2012). Standard solution procedure to solve the proportional equation. In proportion, a/b=c/d, b and c are means while a/d are extremes.



Chapter 4

RESULTS AND DISCUSSION

Socio-demographic profile

Results show that 26 of the 84 respondents fall at the age bracket of 16 to 20 years old and the least or 6 out of 84 respondents fall at the age bracket of 41 to 45 years old. The results imply that majority of Tech4ED users in Tadian are young.

The results also manifest that 48 of the 84 respondents were senior high school and college students, 18 of the 84 were teachers, 13 of the 84 were government employees and only 5 of the 84 were from other sectors (i.e. tour guide, farmer, businessman). The results imply that the Tech4ED center in Tadian, Mt. Province is mostly benefitting only two of its 10 target sectors: the students and teachers.

Table 1: Distribution of respondents by demographic profile for the participants

Characteristics	*n=84*
Age Range	
16 – 20	26
21 – 25	16
26 – 30	10
31 – 35	12
36 – 40	14
41 – 45	6

Status

Senior High School Student	28
College Students	20
Teachers	18
Government Employees	13
Other Sectors (Tour Guide, Farmer, Businessman)	5

Attitudes of residents towards Tech4ED based on perceived usefulness

Respondents were asked to rate six attitude statements towards Tech4ED's perceived usefulness using a 4-point Likert scale ranging from strongly agree to strongly disagree, with four as the highest and one the lowest. Of the 84 respondents, 65 agreed with the statement: "using Tech4ED would improve my job/academic performance" with 10 who strongly agreed or an aggregate of 75 respondents. By far this is the attitude statement that obtained the highest score which implies the intervention was perceived to improve one's capacities.

Results show that the residents have positive attitudes towards Tech4ED based on perceived usefulness validating the argument of TAM, which states that a person will accept a technology if he or she believes that using a particular system would enhance his or her performance (Davis 1989). The results imply that perceived usefulness has an important influence on the behavioral intention to use and adopt Tech4ED in Tadian.

The results were consistent with previous technology acceptance studies using TAM. Cigdem and Ozturk (2016) examined the behavioral intention to use learning management systems or LMS to support teaching and learning activities in higher education institutions in Turkey and determined that perceived usefulness has a direct impact on behavioral intention. Their respondents agreed that using LMS will improve their performance.

The study of Tarhini et. al. (2013) on the student's acceptance of e-Learning environments in developing countries particularly in Lebanon, also validated perceived usefulness as the most influential variable in predicting the intention to use the web-based learning system. They found that students believe that using the web-based learning system will help them improve their learning performance.

Results of this study were also echoed by Alqaralleh et. al. (2020), who examined the mobile or m-Government acceptance in developing countries particulary in Jordan. Their findings proved that the higher level of perceived usefulness will positively affect the citizens' satisfaction and the higher levels of citizen satisfaction lead to more usage and acceptance of m-Government services. Their findings also reiterated that "failure to reveal the advantages of m-Government services to potential users will most likely result in low rate of satisfaction and acceptance" (Alqaralleh et. al., 2020,p. 115).

The rest of the four statements such as: 'Using Tech4ED in my job/studies business/personal use would enable me to accomplish tasks more quickly;" "Using Tech4ED in my job/studies/business/personal use would increase my productivity:" "Using Tech4ED would enhance my effectiveness on the job/ studies/business;" I find Tech4ED useful in my job/studies/business;" were agreed to by half to more than half (42 to 46) of the respondents. More so, if taken in aggregate with those who strongly agreed with the statements, this would range from 46 to 64 respondents implying the positive attitudes towards Tech4ED (Table 2).

Table 2: Respondents' attitude ratings towards perceived usefulness of Tech4ED

	Item	Likert Scale n=84			
		SA (4)	A (3)	D (2)	SD (1)
1A	Using Tech4ED in my job/studies business/personal use would enable me to accomplish tasks more quickly.	6	42	36	0
1B	Using Tech4ED would improve my job/ academic performance.	10	65	9	0
1C	Using Tech4ED in my job/studies/ business/personal use would increase my productivity.	13	55	16	0
1D	Using Tech4ED would enhance my effectiveness on the job/ studies/business.	4	54	26	0
1E	Using Tech4ED would make it easier to do my job/studies/business.	2	52	30	0
1F	I find Tech4ED useful in my job/studies/business	18	46	20	0

Attitudes of residents towards Tech4ED based on perceived ease of use

Respondents were also asked to indicate the strength of their agreement and disagreement of the statements using the 4-point Likert scale ranging from "strongly agree" to "strongly disagree". Out of the 84 respondents, 61 agreed that they find Tech4ED easy to use, while 22 disagreed. Majority of the respondents (76/84) also agreed that learning to use Tech4ED would be easy (Table 3).

Examining the specific indicators, it appears that the respondents have positive attitudes towards Tech4ED based on perceived ease of use because they tend to believe that it is understandable and easy to use. Therefore, perceived usefulness is also a significant determinant of the respondents' intention to use Tech4ED. This validated Davis' (1989) argument that a person will be influenced to adopt a system if it would be free of physical and mental effort.

Results of this study are also parallel with the study of Alqaralleh et. al. (2020). They stressed that potential users will be motivated to use a service or system if it is simple, practical, less hassle, easy to access and use. Some studies also show that perceived ease of use also has a direct influence on perceived usefulness. Garcia (2017) investigated Learning Management System adoption of the Filipino college students. He found that "when a system is easy to use, it is also perceived as useful tool (p. 127). Tarhini et.al. (2013) supported this finding by stating that if students perceive an e-learning tool to be easy to use, they would also

perceive the tool to be useful. Cigdem and Ozturk (2016) also asserted that when users find the system easy to use, they tend to consider the system as beneficial or functional.

Table 3: Respondents' attitude towards perceived ease of use of Tech4ED (scored in a 4-point Likert Scale)

	Item	Likert Scale n=84			
		SA (4)	A (3)	D (2)	SD (1)
3A	I find Tech4ED easy to use.	1	61	22	0
3B	Learning to operate Tech4ED would be easy for me	2	76	6	0

Relative influence of external factors to PU and PEOU

Davis' (1989) stated that the two main determinants (PU and PEOU) of technology adoption are affected by external factors. The external factors identified in this study were drawn from various literatures.

A. Demographics of survey respondents

1A. Age

Young adults ranging between the ages of 16 to 25 are over-represented in this survey sample, while adults ranging between the ages of 41 to 45 were under-represented (Table 1). The results imply that majority of Tech4ED users in Tadian are young. This is could explain why the respondents tend to have a positive attitude towards perceived ease of use of Tech4ED, that, they find it easy to use and learning to operate it would also be easy. Age is one of the most commonly cited

demographic factors influencing ICT use. It indicates the level of maturity and cognitive abilities of an individual. People manifest different traits as they undergo different stages in their growth, which has some effects on their performance and ability to acquire new skills. Younger people could learn how to use and operate new technologies or ICTs like Tech4ED more easily than older people (Puspitasari et.al., 2019). Older people also have less confidence in their ability to use modern technology. This might be because of their late exposure and non-flexibility in learning new things. While the early exposure of the youth to technology give them confidence and the enthusiasm to explore ICT (Oyedipe & Popoola,2019). With the resistance to ICT, older populations may not realize the full benefits of available ICT, which has the potential of increasing the quality of their lives (Czaja et.al. 2006). This means that the more you are exposed to an ICT like Tech4ED, the more that you would realize its full benefit. This explains why the respondents also have a positive attitude towards Tech4ED based on the perceived usefulness.

2A. Status

The majority of the respondents were senior high school students, followed by college students and teachers, while the least number of respondents belong to the other sectors-tour guide, farmer, and businessman (Table 1). This explains the positive attitude of the respondents towards Tech4ED based on perceived usefulness specifically on the item -Using Tech4ED will improve my job or academic performance. According to Majumbar (2012) ICT is a medium for teaching and learning. It serves as an assisting tool in conducting research and assignments. It also prepares students for future occupation.

The results also imply that the Tech4ED center in Tadian, Mt. Province is mostly benefitting only two of its 10 target sectors: the students and teachers. The location of the Tech4ED center could be the main deterrent. Since it is established inside a school, it is more accessible to students and teachers. With the current set-up, other target beneficiaries like the out of school youth, persons with disabilities, senior citizens, Overseas Filipino Workers (OFWs) and indigenous are not fully served.

Level of the respondents' computer self-efficacy

Computer self-efficacy was defined as "an individual's ability to apply his or her computer skills to a wider range of computer related tasks" (Compeau & Higgins, 1995,p189). The respondents were given five questions that assessed their frequency of use, computer experience and knowledge through a 4-point Likert scale ranging from "strongly agree" to "strongly disagree".

Majority of the respondents know how to use a computer (64/84); often use a computer (50/84); and know how to look for information online using the computer (68/84). The number of respondents who know and don't know how to produce content in different forms using the computer were almost at the same level. 41 out of 84 agreed while 42 out of 84 disagreed. Moreover, the majority of the respondents or 68 out of 84, revealed that they do not know how to fix computer problems. Examining the specific indicators, most of the respondents have a good level of computer self-efficacy (Table 4).

According to John (2013) , computer knowledge and previous computer experience significantly influence one's computer self-efficacy. The results were also in support of Aramilde et.al's (2015) findings that computer self-efficacy is one of the determinants of ICT use. The good level of computer self-efficacy of the respondents enabled them to be more capable of assessing how easy it was to understand and use Tech4ED. Results of this study were also echoed by Gupta and Bhaskar (2016), who examined E-government adoption of the citizens in India. Computer literacy makes the respondents more capable to understand and use the e-government services. Kim and Park's (2017) findings showed that those with the skills in using a computer are more frequent users of the internet. Thus, more knowledge and skills could mean less effort in using various technologies, making them better adopters.

Furthermore, the results of the study are also parallel to the study conducted by John (2013) that computer self-efficacy has an effect on the respondents' perceived usefulness. The higher the computer self-efficacy of the individual, the more he/she perceives information as useful.

Table 4: Respondents' level of computer self-efficacy (scored in a 4-point Likert Scale)

	Item	Likert Scale n=84			
		SA (4)	A (3)	D (2)	SD (1)
5A	I know how to use a computer.	14	64	6	0
5B	I often use a computer.	7	50	27	0
5C	I know how to fix computer problems.	1	29	54	0
5D	I know how to look for information online using the computer.	4	68	12	0
5E	I know how to produce content in different forms using the computer	1	41	42	0

Tech4ED success stories

However, it is not too safe to conclude that a person with low computer self-efficacy will not use Tech4ED. In Luna, Apayao, a student with disability was able to expand his computer knowledge through the Computer Literacy Course provided by Tech4ED. This helped him to continue his studies through the Alternative Learning System or ALS and advanced to college level (Baculi, 2019). DICT's Tech4ED eMagazine published in June 2019 presented the testimonials of those who had zero knowledge of using a computer but benefitted from Tech4ED. Two women from Bataan acknowledged the importance of knowing how to use a computer in this digital age.

"Noon, hindi talaga ako marunong mag computer. Pero pagkatapos ng training dito sa Tech4ED, Natutunan ko na mahalaga pala ang paggamit ng computer. Kasi ngayon modern na ang technology tapos naiiwan kami sa modernong buhay kasi wala kaming training sa computer. Malaking bagay na napukaw ang aming kamalayan dahil sa pagturo nila tungkol sa computer."

"Kahit ako ay may edad na, pwede pa pala kaming mag-computer. Dati takot ako. Marinig ko palang ang computer, talagang sinasabi ko na hindi talaga ako marunong. Pero ngayon sa tatlong araw na pagte-training, natuto na ako. Kaya nagpapasalamat ako at kahit papano ay nakapag-computer na ako."

Another beneficiary explained that despite her age, she was able to learn how to use a computer with the help of Tech4ED.

"Dati hindi ako marunong mag computer, ngayon nagkaroon na kami ng idea na marami palang matututunan dito sa computer at nagpapasalamat ako na nabigyan kami ng pansin kahit na kami ay may mga edad na."

A member of an indigenous group admitted that his lack of necessary skills hinders him to use a computer but with the help of Tech4ED, he was able to overcome the barrier.

"I'm a High School graduate. I'm scared of using the computer because we, the Lumads, are cautious around objects we are not familiar with. We think we might destroy them. But not anymore when I learned about Tech4ED and its services. We are grateful that through this program, we felt that the government is looking after us, Lumads."

Their testimonials imply that Tech4ED is a platform that would enhance an individual's computer self-efficacy. Knowing how to use a computer is not always a prerequisite for using a new technology.

Respondents' perceptions on the facilitating conditions

Vankatesh et. al. (2003) identified facilitating conditions as determinants of ICT adoption. These include resources, knowledge and specific person or group that is available to assist the end-users.

Respondents in this study were asked to rate their degree of agreement and disagreement using a 4-point Likert scale to four identified facilitating conditions namely: accessibility, internet connectivity, information dissemination and skills training. 40 out of 84 respondents strongly disagreed that the Tech4ED center in Tadian is easily accessed by all the residents. 39 out of 84 disagreed that the facility has good internet connection, while only 4 out of 84, strongly agreed. The majority of the survey participants (70/84) disagreed that there is continuous information dissemination as regards to the Tech4ED project and proper skills training. Examining the specific indicators, most of the respondents were unsatisfied with the items under facilitating conditions (Table 5).

Table 5: Respondents' perceptions on the facilitating condition (scored in a 4-point Likert Scale)

	Item	Likert Scale N=84			
		SA (4)	A (3)	D (2)	SD (1)
6A	The Tech4ED center is easily accessed by all the residents (accessibility)	0	19	25	40
6B	The facility has good internet connection. (internet connectivity)	4	14	39	27
6C	There is a continuous information dissemination as regards to the Tec4ED project (information dissemination)	1	14	36	34
6D	There is a training on the use of Tech4ED (skills training)	1	13	30	40

Low utilization due to inaccessibility

Aramilde et.al (2015) found that accessibility to ICT and location of ICT access are leading predictors of ICT use. This means that the ease of accessing the location of an ICT may lead to use. This also echoes the findings of Alampay (2006)

that lack of facilities or distance to the facility is among the biggest hurdles to ICT use. In the case of Tadian, the Tech4ED center is located in a school which primarily caters to students and teachers only. This would explain the low utilization of the Tech4ED center in Tadian.

Based on the study conducted by the Asian Development Bank or ADB the inclusiveness, sustainability, and impact of public ICT center for rural development, the center type or model and location are among the constraints to ICT use. It has been said that a location can make it easier or more difficult for an ICT center to thrive especially in rural areas like Tadian. Only few people will become regular customers if the center is far from their home or workplace. An unreliable transportation means could worsen the demand constraints because only a few people can travel to and become regular users of an ICT center. Based on Google Map's estimation, the distance from Tadian School of Arts and Trades and Tadian Municipal Hall is 9 kilometers or equivalent to 18-minute drive. The area where the municipal hall is located is one of the most populous areas in the town. The number of people that will use a given ICT center regularly is circumscribed to a radius around 3 kilometers (ADB, 2017). This suggests that the Tech4ED center in Tadian is inaccessible. Only few people are near the center. Thus, there are few Tech4ED users and few are also familiar with the benefits of Tech4ED.

Outstanding Tech4ED centers

One of the top performing Tech4ED centers in the country is the Mauban eLearning Ville in Quezon Province. The center is located in a public market that is accessible to many and was opened with the support of the Local Government Unit

or LGU. It provided real-time weather and disaster risk information to the residents; low-cost ICT facility for students, ICT trainings for job seekers, and Digital Literacy trainings for those who have little knowledge on computer use. It also offers online e-Counseling (Chua, 2018). The officials of the Municipality of Liloan, Southern Leyte also took the initiative to launch its Tech4ED center in 2016. The program is very crucial in providing internet access and ICT-related services to all the constituents from different sectors (Laberinto and Martines, 2019). This implies that the support of the LGU is paramount in the sustainability and effective utilization of Tech4ED. Proper assessment should be done when establishing Tech4ED centers. ADB'S (2017) report also confirms that here in the Philippines, Tech4ED centers funded by the national government and local government units have done well. According to Fourie (2008) the problem on accessibility could be solved with the concerted effort of the government and non-government organizations.

The Tech4ED center opened in Zamboanga City Jail, which provided informal education and training among the inmates is also among the successful models. One of the inmates was able to enhance his skills in graphic designs, which became his source of income. (Laberinto, 2018). Another successful Tech4ED center is the Butuan City Public Library, which provided digital literacy trainings to out-of-school-youth and adults, indigenous people, educators, OFWs, students and senior citizens. In 2017, over 70,000 users benefitted from the services provided by the Tech4ED center in Butuan City Public Library (Malunhao and Laberinto, 2019). The Tech4ED Lakbay Kariton of Lingayen,Pangasinan is effectively promoting and bringing ICT contents and government services to the remote communities (Laberinto and Villapondo, 2018). These success stories imply that proximity of the center to the target users and setting it up in a public space would result to higher utilization rate.

Public libraries are more accessible to all the sectors in a community than schools. The success of Tech4ED centers in jails is expected because the target beneficiaries are in the same facility. Tech4ED Lakbay Kariton Model proves that bringing a service closer to the target beneficiaries would ensure a greater success.

In Sri Lanka, enterprise centers had the largest number of visitors and lowest closure rates. While ICT centers run by community-based organizations and ICT centers in libraries were also resilient. However, ICT centers run by religious institutions fared poorly (ADB,2017).

Weak internet connection

The results of the study also suggest that the center has weak internet connection. Gerstr and Zimmerman (2003) considered connectivity as one the factors in ICT use. Faster internet speed improves the overall experience of the users which would encourage them to explore more services and spend more time on the platform. Garcia's (2017) study found that internet connectivity experience had a positive relationship with perceived ease of use. The user will notice the ease of using a system when the internet connection is fast. Thus, he or she will more likely to adopt the system.

DICT should consider Tadian, Mt. Province in their free Wireless Fidelity (Wi-Fi) site project. Based on reports, there will be 944 sites in Cordillera. The first site was launched in Baguio on November 2019 (Agoo,2019). Telecommunication companies or internet service providers should intensify their programs to bring world-class mobile internet service to all corners of the country. Additional cell sites

should be launched in mountainous areas like Tadian for faster and better internet connection for all transactions.

Lack of information dissemination and training

The quantitative data also revealed that there is no continuous dissemination of information as regards to the Tech4ED project. The low usable response rate in this study and the number of registered platform users clearly indicate that there is a lack of information dissemination or the project was not highly publicized. These imply that the government particularly DICT should intensify its advocacy and promotion component through interventions such as seminars and information drives that emphasize the benefits of Tech4ED.

Alqaralleh et.al (2020) stated that failure to reveal the advantages of a system (i.e. m-Government) to target users will most likely result in low rate of satisfaction and adoption. They also suggested that when providing information about a new ICT, its usefulness should be emphasized. Delivery of information should be in an easy, clear and understandable way.

The results also suggest that the respondents lack the proper training. Gerstr and Zimmerman (2003) pointed out that the intention to use an ICT is influenced by the capability or the skills of the potential users. Almekhlafi and Almeqdadi (2010) reiterated that when it comes to ICT adoption, proper workshop on technology integration should be provided. Skills development of target users and proper attitude towards the application of ICT are relevant. Thus, the lack of skills and

knowledge may hamper people's perception on how an ICT like Tech4ED can benefit their lives. The government should provide field demonstrations and trainings to educate the beneficiaries on the possible opportunities that a new technology could bring (Mariano et.al,2012). Beneficiaries of an ICT should have the competencies for them to have the confidence and overcome apprehensions associated with using a new technology (Daling,2018). Therefore, gaining the needed skills would motivate people to use Tech4ED and help them realize how it can benefit their lives.

FGD participants' insights on the facilitating conditions

On the issue of accessibility, according to two focus group discussants, DICT only provided the software and the recipient will provide the hardware. This explains why most of the Tech4ED centers were established in schools. The schools have the necessary equipment and resources needed for the project. One FGD participant emphasized that the community is welcome in the center. However, she suggested that another center should be established that is more open to the public. Thus, a center inside the municipal hall is a better option.

> ***DepED Representative 1:*** *Iyong recipient po kasi noong time na iyon ay initially LGU's po when we heard about the program, nakita natin ang isang segment, skills, doon po tayo nagkainteres so we offered to DICT resources na meron sa school and ito iyong binigay ng Central*

Office through the DepEd computerization program. Iyong agreement kasi Ma'am , ipoprovide po kasi ng recipient iyong hardware. Ibibigay naman ng DICT iyong software.

Principal: *Assets ng community are in this school.*

DepEd Representative 2: *All the schools are encouraged to establish partnerships with all the sectors in the community and we have good partnerships with the LGU so it does not actually limit the community from coming to the center. Since we have the computers, that's the reason why schools were chosen as the recipient. Later on, we look forward to having similar centers and we will seek the support of LGUs so that we can also have other center which is more open to the community. But the community is invited to come to the center. The advocacy part should be strengthened so that more people will be aware especially after the training of barangay secretaries.*

However, FGD participants support the survey results that there is a weak internet connection and sought proper marketing and promotion of the project for better utilization.

DedED Representative 1: *Iyong strength ng internet natin. The good thing is meron naman po itong upcoming projects ng DICT na magcocompliment din naman po ditto sa program nila accordingly.*

Teacher 1: *Improve internet connectivity*

Principal: *In our part of managing the school, for us this is development so our long term goal is to promote really this system so*

that it should be sustained sana kasi of course, looking at the economic situation of the community of the town, where it's really hard for us. The internet alone is costly while if we have this, of course it will help. So first we have to promote it and provide sana a way of marketing it. Ang problema natin sa ngayon is that if we could hire someone and manage this Tech4Ed so that it will be really marketed to the public.

DepEd Representative 2: *Only we have to maybe broaden the advocacy for this facility.*

The overall results on the respondents' perceptions on the facilitating conditions infer that these do not have a relative influence on the respondents' attitudes toward Tech4ED based on perceived usefulness and perceived ease of use.

Respondents' behavioral intention to use Tech4ED

Respondents were asked to rate an attitude statement to determine their behavioral intention to use Tech4ED in the next days using a 4-point Liker scale ranging from strongly agree to disagree. Combining the results of strongly agree and agree, 45 out of 84 respondents intend to use Tech4ED in the next days. While 35 out of 84 revealed that they don't intend to use Tech4ED in the next days. The ratio of those who intend and do not intend to use Tech4ED is 45 is to 35 or 9 is to 7 (9:7). The results imply that majority of the respondents are in favor of Tech4ED and the intention to use it will lead to adoption (Table 6).

Table 6: Respondents' behavioral intention to use Tech4ED (scored in a 4-point Likert Scale)

	Item	Likert Scale N=84			
		SA (4)	A (3)	D (2)	SD (1)
9A	I intend to use Tech4ED in the next days.	9	36	39	2

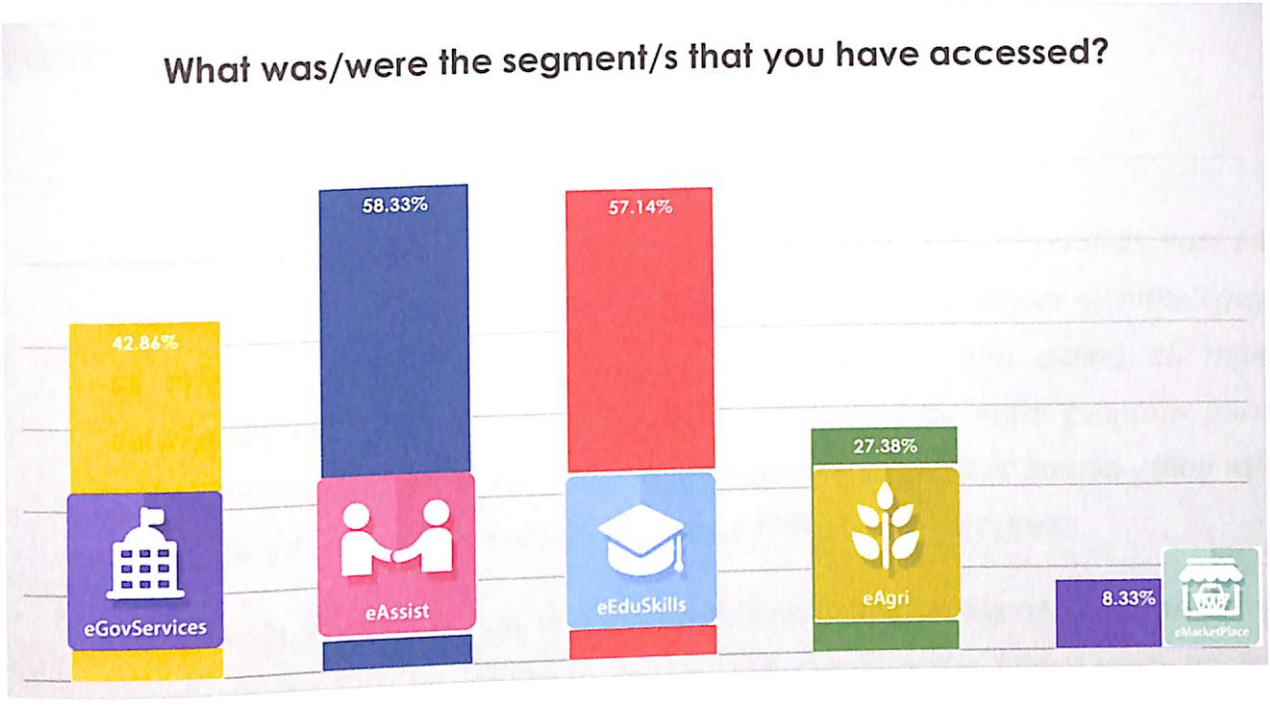
Respondents' most accessed segments

In additional to the Likert Scale data, one more question was asked: What was/were the segment/s that you have accessed? The respondents were asked to choose all that apply. As a result, 36 out 84 or 42.86 % have accessed the eGovServ, 49 out of 84 or 58.33 % have accessed eAssist, 48 out of 84 or 57.14 % have accessed eEduSkills, 23 out of 84 or 27.38 % have accessed eAgri, and 7 out of 84 or 8.33% eMarketPlace.

The results suggest that the most accessed segments are eAssist and eEduSkill and the least are eAgri and eMarketPlace. This could be explained by the status of the respondents who were mostly teachers and students. It is understandable that they only utilize the platforms that are most useful to their current status. The result is in congruent with the results of the FGD.

Knowing what segments, the respondents were most and least interested in have implications, for instance, in how the segments (especially the least accessed) could be best delivered.

Figure 7: Most accessed Tech4ED segments



FGD participants' positive attitude towards Tech4ED project

Participants of the FGD, identified the eEduSkill segment as the most relevant platform. It provides reference materials related to Technical Vocation Livelihood or TVL Track. One of the participants said that he was able to get tips on cellphone repair. Another participant got tutorials on food and beverage service.

> ***Student 1:*** *Ma'am eEduSkill po kasi meron po doon iyong cellphone repair na class kaya iyon po ang ginagamit naming.*

> ***Student 2:*** *Nakakatulong po ang eEduSkill dahil meron iyong section na food and beverage. May tutorial po siya tungkol sa waiter servicing. Nakakatulonng din po ito para maexpand naman po iyonng kaalaman naming sa mga ganitong bagay.*

TVL teachers who don't have enough reference materials also benefit from the platform, which provides a wide array of credible and reliable sources.

Teacher 1: *Sa amin mas madali naming ginagamit yung eEduSkills kasi sa field naming TVL trucks ay hindi lahat ng skills matutunan diyan ay nakalagay sa reference book at tyaka parang may shortcut ang dating sa mga estudyante kaya ang ginagamit namin ay Tech4Ed for enter program para yun doon sila magreresearch. Research more on that and of course , they will be equipped with sufficient knowledge and skills on that program.*

Teacher 2: *Adding to that is we usually encounter problems on references especially the TVL, where these people, TVL teachers don't have really books so the you-solve is a Tech4Ed. For them, it's really useful in the sense na they come here and update themselves.*

A FGD participant explained that they have confidence in the references provided by Tech4ED.

DepED Representative 1: *Although we have to say na references kasi very wide naman po iyong internet atin ma'am but with this Tech4Ed platform ma'am kasi , the reliability and the credibility of the sites, natingnan na po ng DICT so for us, confident kami iyong nakukuhang resources naman dito is nareview po siya kasi iyong sa internet naman po meron din naman pong poor references na nakukuha na at times misleading po siya. Although we're not limiting ourselves, may ibinibigay din tayong ibang pwedeng pagkuhanan ng references kasi iyang objective natin atleast mabigyan sila ng maraming referece para hindi macontain iyong learning ng bata sa Mountain Province. With that, nakikipaglink din kami sa mga ibang partners din na willing din pong ipagamit ang mga services nila.*

Validation of TAM

This research adopted TAM as the basic framework to explore relationships among externals factors, perceived usefulness, perceived ease of use and the respondents' intention to use Tech4ED in the next days. The results of this study validated TAM's argument that perceived usefulness and perceived ease of use are the strongest predictors of behavioral intention. The outcomes of this research are also parallel with previous studies. (Tarhini et.al, 2013; Garcia,2017; and Alqaralleh et.al, 2020).

The study had revealed other key findings. External factors such as demographic profile particularly age and status and computer self-efficacy level had relative influence on the perceived usefulness and perceived ease of use of Tech4ED by the respondents. On the other hand, the facilitating conditions such as inaccessibility, lack of training, poor information dissemination and slow internet connection were not deterrents to the respondents' perceived usefulness and perceived ease of use of Tech4ED. This is contrary to the studies conducted by Marchewka and Kostiwa (2007) and J. Garcia et. al (n.d). But the findings validated the empirical results of Vankatesh et. al. (2003) hypothesis, which stated that facilitating conditions do not have a direct effect on behavioral intention if both performance expectancy or perceived usefulness and effort expectancy or perceived ease of use are present.

However, the low number of respondents for this study signifies a low utilization of the Tech4ED project among the residents in Tadian. In fact, based on the data provided by DICT in 2021, there are only 141 registered Tech4ED users at Tadian Schools of Arts and Trades. This is only 4.5 percent of the total population of Barangay Poblacion, where Tech4ED is located. It could therefore be assumed that the indicated facilitating conditions could also be deterrents to the adoption of Tech4ED among the residents in Tadian in general.

Overall, this study suggests that a digital divide still exists for a certain segment of the population in Tadian, Mt. Province, such as the out-of-school youth and adults, people with disabilities, senior citizens, farmers and fisherfolks.

Chapter 5

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

In 2014, DICT launched a project called Tech4ED which stands for Technology for education, employment, entrepreneurship, and economic development. As of August 2019, there are more than 3000 Tech4ED centers operating in the Philippines, and one of the pioneers Tech4ED centers was opened in the far-flung area of Tadian, Mt. Province in April 2016. Since its launch, no study has been conducted yet on Tech4ED adoption not only in Tadian but, for the other centers as well. With this, the purpose of the study is to identify the determinants of Tech4ED adoption among the residents of Tadian, Mt. Province. It specifically sought to find out the attitude of the residents towards TECH4ED based on perceived usefulness; assess the attitude of the residents towards Tech4ED based on perceived ease of use; identify the relative influence of the external factors on the perceived usefulness, perceived ease of use, and behavioral intention to use Tech4ED; and ascertain the residents' behavioral intention to use Tech4ED.

The study used TAM (Davis,1989) to evaluate the Tech4ED adoption among the residents of Tadian, Mt. Province. Under TAM, there are two constructs: the perceived usefulness (PU) and perceived ease of use (PEOU) which are affected by the external factors: demographic profile, computer self-efficacy and facilitating conditions.

The study employed a one-shot survey research design. This is a form of non-experimental design which is consist of a single observation and involves only one

empirical cycle: research question—data collection—analysis—report. A questionnaire was used to generate residents' responses on their intention to use and adopt Tech4ED. The study was conducted in Barangay Poblacion, Tadian, Mt. Province with a total population of three thousand two hundred sixteen (3,216). Due to the geographical locations of the target population, the ample size was determined using Yamane's formula. Convenience sampling technique was used in selecting the respondents. Considered respondents were those familiar with the Tech4ED which turned out to be only 1 out of 4 (84 out of 313). Focus Group Discussion or FGD and document review were used as triangulation measures to substantiate the results generated in the survey. Data results were analyzed through descriptive statistics which is a technique that simplify, summarize, and describe the data.

Results showed that both perceived usefulness (PU) and perceived ease of use (PEOU) influenced the behavioral intention of the respondents to use Tech4ED, which leads to adoption. This is a validation of TAM. Both PU and PEOU were influenced by the demographic profile specifically age and status (students, teachers, governments employees and other sectors) and computer self-efficacy of the respondents. However, PU and PEOU of the respondents were not affected by the facilitating conditions specifically internet connectivity, accessibility, information dissemination and skills training. But these need to be addressed to encourage more people to use the system. Overall, the study revealed a low utilization rate of the Tech4ED project in Tadian, Mt. Province. Thus, a digital divide still exists for a certain segment of the population.

Conclusions

Out of three hundred thirteen (313) residents, only eighty-four (84) were considered respondents as they have knowledge or familiarity with Tech4ED.

Data gathered showed positive attitude from the respondents about the perceived usefulness of Tech4ED project. Because of the different segments of Tech4ED and the information that they could get, they perceived Tech4ED useful in their job, studies, and business as this would make their work easier and quicker. In addition, they also perceived Tech4ED as a project that can enhance their skills and increase their productivity at work. Small percentage of the respondents had negative attitude on the perceived usefulness of the Tech4ED. They don't see it as a project that can make their job easier and quicker or would enhance their skills and increase productivity because the content has nothing to do with the nature of their work or if there is relevance, information is limited.

Gathered data also showed positive attitude from the respondents about perceived ease of use of Tech4Ed. Majority of the respondents perceived Tech4ED easy to use and learning to operate would also be easy. This is supported by the fact that most of the respondents have good level of computer self-efficacy. Since majority of the users are adolescents and early adults, they have confidence in using new technology than older people who have less confidence in their ability to use computers and adopt to new technology. Small percentage indicates that they perceive Tech4ED as hard to use, this was given by the fact that older respondents prefer the traditional way or they have less knowledge in navigating computers and encounter more difficulties than younger people do.

Demographic was asked to know the profile of the respondents and examine if there is impact on the study. Based on the data gathered, most of the respondents were adolescents and early adults. With this, results revealed that younger people are more aware of the technology-based projects than older people. Younger people have confidence in using new technology than older people who have less confidence in their ability to use computers and adopt to new technology. They encounter more difficulties than younger people do. While older people tend to use the standard way or process, younger people are more eager to adopt to different technologies as this would help them improve the quality of their lives. In addition to age, the status*(student, teachers, government employees and other sectors)* of the respondents was also profiled. Majority of the respondents were students, seconded by teachers, and the remaining percentage was shared by government employees and other sectors. We can conclude from the data that the respondents' status *(student, teachers, government employees and other sectors)* or nature of work can influence Tech4ED's adoption. Due to the nature of their work, students and teachers use Tech4ED because the eAssist and eEduskills segments are beneficial to them. The information that they get from Tech4ED helps them to be more productive and competent; and it makes their job easier. Another thing, the first Tech4ED Center in Tadian was built in Tadian School of Arts and Trades, students and teachers are more aware of this project. However, government employees and other sectors shared the lowest percentage to the conclusion that they are not aware of Tech4ED and/or the segments included in the Tech4ED are not beneficial or even relevant to their jobs.

Aside from the demographic profile, computer self-efficacy is one of the external factors that affects perceived usefulness and perceived ease of use of Tech4ED. Thus, people with higher computer self-efficacy are more likely to use Tech4ED. Since they already have basic knowledge in computer navigation, it would be easy for them to access the different segments of Tech4ED. The results also proved that the higher the individual's computer self-efficacy, the more he/she perceives an ICT to be useful.

The findings revealed that facilitating conditions do not have a significant influence on the perceived usefulness, perceived ease of use and behavioral intention to use Tech4ED. But the results show that the facilitating conditions are problems that should be addressed, which could help increase the utilization rate of Tech4ED. Based from the data gathered, we can strongly say that the Tech4ED center cannot be accessed easily. It was opened in a school in Barangay Poblacion in Tadian, and is not open 24 hours. People who wish to use Tech4ED have to travel to Poblacion and they can only access it with limited time. This brings inconvenience to residents especially if they will be coming from sitios and barrios and need more time to use Tech4ED. The purpose of making their job easier and quicker; enhance their skills and increase productivity would no longer be experienced because of the limited time and inaccessibility of the center. Another sub-factor of facilitating condition is internet speed. Currently, the center is using Wi-FI. Good internet connection will give users seamless usage of the Tech4ED. Poor internet connection does the other way around. According to the respondents, the center has weak internet connection leaving users with frustration over Tech4ED. Weak internet connection affects the productivity of an individual in getting information that they need. The purpose of serving people is futile and useless without good internet

connection. Moreover, there is no continuous information dissemination about the Tech4ED project. Information drive is very important to create awareness to people about the existence of any service like Tech4ED. People will not be educated on what the project is, what are the things that can be done using the project, how it could help the residents and even their community and even how to use and navigate it. While most of the users are computer self-efficient, training should still be done to ensure that they know how to navigate and use the system. Users and non-users who are having difficulties navigating or those who have less knowledge in computer shall be trained to build their confidence in using and navigating Tech4ED.

Lastly, based from the data gathered, we can therefore conclude that respondents are in favor of Tech4ED as they intend to use it on the next days. Tech4ED was re-echoed to them, why is it useful and how easy it is to navigate. It made them realized that Tech4ED will help them make their job/business/work more quickly and easily, will enhance their skills, increase their productivity and competency in school and work.

Overall, both perceived usefulness and perceived of ease were considered as the determinants of Tech4ED adoption among the residents of Tadian, Mt. Province. The study validated the constructs of TAM.

Recommendations

The Department of Information and Communication Technology (DICT) should establish more Tech4ED centers in Tadian, Mt. Province but easy accessibility to the center must be guaranteed. If the target of the project are the different sectors in the whole community, a center within or near the municipal hall is

the ideal model. The project should be sustained and supported by whoever the local chief executive is.

Moreover, the center's operating hours should be extended to make the experience of users more worthy. Giving limited time to users will leave frustrations especially to those who don't have computers and internet connection at home and they need to do their assignments, projects, or research and only relying on Tech4ED. Extending more hours will make them more productive and competent and make their tasks quicker.

Putting additional Tech4ED centers will also create awareness. This would also be an indication that the government is really serious and dedicated to improve digital literacy, open opportunities for the underserved and marginalized towards improved quality of life and a more competitive Philippines.

There is also a need to increase the Internet bandwidth and offer consistent and reliable WI-FI connection in the center. As a temporary solution, the researcher highly suggests to have Wi-Fi Booster. For long lasting solution, the researcher highly recommends to DICT to consider Tadian, Mt. Province in their Free Wi-Fi site project to support the poor or weak internet signal. Also, DICT should partner with telecommunication companies or internet service providers to intensify their programs in bringing world class internet service to all corners of the country by launching sites in mountainous areas like Tadian for faster and better internet connection.

The advocacy and social mobilization should be intensified. Not all residents are familiar with Tech4ED. This has been proven by the low number of respondents in this study and the registered Tech4ED users in Tadian which is only 114. Promoting Tech4ED through social media may not draw a positive result since the

Internet in Tadian is weak. The effective ways of information dissemination are: visiting the sitios of every barangay to echo or introduce Tech4ED; and distribution of leaflets or brochures containing the information that they need to know about Tech4ED. The Information dissemination campaign should focus on the perceived usefulness or benefits that the target users can get.

The researcher strongly recommends the continuous training of center managers and all target users especially older residents or those who have less knowledge about computer to build their confidence in navigating Tech4ED. During the pandemic, trainings can be done virtually.

Since most of the users are students and teachers, the researcher highly recommends to make a digital library that they can access or use even without Internet. Moreover, it is highly recommended to continue to strengthen the services from the most accessed segments (eAssist, eEduskills, and eGovServ) and improve the least accessed segments like eAgri and MarketPlace. For the improvement of eMarketPlace, tips on starting a business during this pandemic could be uploaded. It has been observed that most of the topics in the eAgri segment are about rice production. Tips and knowledge on other crops should also be included.

Lastly, the researcher highly suggests additional segment/s to be included in Tech4ED that would be beneficial to the residents of Tadian like Help Desk wherein all questions, concerns, feedbacks and suggestions of the residents shall be placed in. With this, the voice of the residents will be heard and they would feel that they are valued.

Future studies could investigate the specific impact of Tech4ED to each of its target beneficiaries: 1) Out-of-School Youth and Adults (2) Educators (3) Students (4) People with Disabilities (5) Women (6) Senior Citizens (7) OFWs, their

families/relative (8) Entrepreneurs (9) Indigenous People (10) Farmers and Fisherfolks. The features of each segment (eGovServ, eAssits,eEduskills, eAgri, eMarketplace, eHealth, Gender and Development,and Rural Impact Sourcing) could also be analyzed to determine what should be improved or modified to ensure that they will be utilized to their full capability. Future studies could investigate the socio-economic impact of Tech4ED and assess the effectiveness of the project in bringing sustainable development, which is its ultimate goal. This could influence decision makers on whether to replicate/adopt the project or not in other parts of the country. Lastly, the impact and use of Tech4ED in the new normal set-up of academic institutions during this pandemic could also be explored. Nonetheless, this study could serve as one of the pioneers that offer information on Tech4ED adoption in the Philippines.

Bibliography:

Agoot, Liza. (2019). DICT kicks off 1st free Wi-Fi site in Baguio. Retrieved from: https://www.pna.gov.ph/articles/1087246

Alampay, Erwin. (2006). Analysing Socio-Demographic Differences in the Access and Use of ICTs in the Philippines Using the Capability Approach. Retrieved from: https://onlinelibrary.wiley.com/doi/abs/10.1002/j.1681-4835.2006.tb00182.x

Almaiah, Mohammed et. Al. (2019). Applying the UTAUT model to explain the student's acceptance of mobile learning system in higher education . Retrieved from: https://www.researchgate.net/publication/337684213_Applying_the_UTAUT_model_to_explain_the_students'_acceptance_of_mobile_learning_system_in_higher_education

Almekhlafi, A. G. and Almeqdadi, F. A., (2010). Teachers' perceptions of technology integration in the United Arab Emirates shool classrooms. Educational Technology and Society, vol. 12, pp.165-175.

Alqaralleh, Bassam et. al. (2020). An Integrated Conceptual Model for m-Government Acceptance in Developing Countries: The Case Study of Jordan. Retrieved from: https://www.researchgate.net/publication/340687345_An_Integrated_Conceptual_Model_for_m-Government_Acceptance_in_Developing_Countries_The_Case_Study_of_Jordan

Anonymous. (2010). ICT. Retrieved from: https://techterms.com/definition/ict

Aramilde, Kolawole, LAdipo, Sunday and Adebayo, Ibatayo. (2015). Demographic Variable and ICT access As Predictors of Information Communication Technologies Usage Among Science Teachers in Federal Unity School in Nigeria. Library Philosophy and Practical (e-journal).1217. pp. 1-27.

Asian Development Bank (2013) Bangladesh: Grameenphone Telecommunications Project and Grameenphone Telecommunications Expansion Project. Retrieved from: http://www.adb.org/documents/bangladesh-grameenphone-telecommunications-project-and-grameenphone-telecommunications-exp

Asian Development Bank. (2017). Public ICT Center For Rural Development Inclusiveness, Sustainability and Impact. Mandaluyong City: ADB

Baclig, Christina. (2021). PH population growth slows but still among highest in SE Asia. Retrieved from: https://newsinfo.inquirer.net/1433752/ph-population-growth-slows-but-still-among-highest-in-se-asia#ixzz6wGb8zmdy

Baculi, Virginia. (2019). How a man with disability thrives to pursue his education through ALS. The eMagazine of DICT, Vol 1, No. 1, p.7

Bandura,Albert. (1997). Self-efficacy: The Exercise of Control. New York: Freeman

Blurton, Craig. (1999). New Directions of ICT-Use in Education. Retrieved from: https://www.academia.edu/36107452/New_Directions_of_ICT-Use_in_Education

Bonifacio, A. (2013). Developing Information Communication Technology (ICT) Curriculum Standards for K-12 Schools in the Philippines. Paper presented at the The Sixth Conference of Vol. 5 No. 3 October 2018 281 MIT's Learning International Networks Consortium (LINC), MIT, Cambridge, Massachusetts, USA

Businessmirror.(2017). DICT exec eyes larger budget for Tech4Ed. Retrieved from: https://businessmirror.com.ph/2017/06/17/dict-exec-eyes-larger-budget-for-tech4ed/

Chua, Angel. (2018). National Tech4ED Awards: Outstanding Category.The eNewsletter of DICT, Vol 2, No. 1, pp. 15-16.

CICT. (2008). The Strategic Roadmap of the Philippine Community eCenter program 2008-2010. Quezon City. CICT

Cigdem, Harun and Ozturk, Mustafa. (2016).Factors Affecting Students' Behavioral Intention to Use LMS at a Turkish Post-Secondary Vocational School. International Review of Research in Open and Distributed Learning. Volume 17, no. 3, pp. 276-294

Conjoint.Ly. (n.d.). Types of Designs. Retrieved from: https://conjointly.com/kb/research-design-types/

Compeau, D. R. and Higgins, C.A (1995). Computer Self-efficacy: Development of a Measure and Initial Test. MIS Quarterly,pp. 189-211.

Czaja, Sara. et. al. (2006). Factors Predicting the Use of Technology: Findings From the Center for Research and Education on Aging and Technology Enhancement. Retrieved from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1524856/

Daling, Rudy. (2018). Accepting ICT Integration: A Challenge to School and Curriculum. Retrieved from: https://ijern.com/journal/2018/September-2018/13.pdf

da Ponte, João Pedro and Silvestre, Ana Isabel. (2012). Missing Value and Comparison Problems: What pupils know before the teaching of proportion? Retrieved from : file:///C:/Users/Legion/Downloads/Dialnet-MissingValueAndComparisonProblemsWhatPupilsKnowBef-4266679.pdf

Davis, Fred. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. Retrieved from: https://www.jstor.org/stable/249008

Dean, Amelia. (2019). Tech4ED. Retrieved from: https://psa.gov.ph/sites/default/files/7.6.3%20Tech4Ed%20.pdf

DICT.(2018).Tech4ED Center Managers Toolkits. Quezon City. DICT

DICT. (2019). What do people say about the TechED Project? The eMagazine of DICT, Vol 1, No. 1, p.9

DICT.(2020). ₱46.6-B Budget for PH Digital Transformation Pushed for 2021. Retrieved from: https://dict.gov.ph/%E2%80%8E%E2%82%B146-6-b-budget-for-ph-digital-transformation-pushed-for-2021/?fbclid=IwAR2lyJ8RH7gvlhPI5Z1Hi5ZAAjOpy89jMCfqSIliuoMoJwOxn3-j2gArxXM

Dole, Shelley and Shield, Malcolm (2002). Investigating textbook presentations of ratio and proportion. Retrieved from: https://eprints.qut.edu.au/8334/1/8334.pdf

Dudovskiy, John. (2012). Convenience sampling. [online] Research Methodology. Retrieved from: http://research-methodology.net/sampling-in-primary-data-collection/convenience-sampling/

Flor,Alexander.(2001). ICT and Poverty: The Indisputable Link. Retrieved from http://ftp.unpad.ac.id/orari/library/library-ref-ind/ref-ind-1/application/poverty-reduction/!%20ICT4PR/ICT%20and%20poverty%20-%20the%20link%20(WB%20Report).pdf

Flor, Alexander.(2008). A policy and planning framework on information and communication technology for basic education in the Philippines Retrieved from: http://ijedict.dec.uwi.edu/viewarticle.php?id=491&layout=html

Fourie, Louis (2008). Enhancing the Livelihoods of the Rural Poor Through ICT: A knowledge Map. Retrieved from http://www.infodev.org/infodev-files/resource/InfodevDocuments_516.pdf

Galolo, Jeandie. (2015). Tech centers to support Free WiFi. Retrieved from: https://www.sunstar.com.ph/article/32848/Sports/Tech-centers-to-support-Free-WiFi

Garcia, Manuel (2017). E-Learning Technology Adoption in the Philippines: An Investigation of Factors Affecting Filipino College Students' Acceptance of Learning Management Systems. Retrieved from: https://www.researchgate.net/publication/323576195_E-Learning_Technology_Adoption_in_the_Philippines_An_Investigation_of_Factors_Affecting_Filipino_College_Students'_Acceptance_of_Learning_Management_System

Garcia, J. et. Al (n.d). ICT Infrstructure Set and Adoption of Filipino and Indonesian SHS Students: Applicaion of UTAUT. Retrieved from: https://www.academia.edu/40727933/ICT_Infrastructure_Set_and_Adoption_of_Filipino_and_Indonesian_SHS_Students_Application_of_UTAUT

Garcia, Sergio. (2014, February 28). Why ICT for Development. Retrieved from https://europa.eu/capacity4dev/public-ict/minisite/why-ict-development-ict4d

Gefen, David, et.al. (2003). Inexperience and experience with online stores: The importance of TAM and Trust. Retrieved from: https://www.researchgate.net/publication/3076771_Inexperience_and_experience_with_online_stores_The_importance_of_TAM_and_Trust

Gerster, Richard and Zimmermann, Sonja. (2003). Information and Communication Technologies (ICTs) for Poverty Reduction Discussion Paper. Retrieved from http://www.gersterconsulting.ch/docs/ict_for_poverty_reduction.pdf

GOVPH. (2014).Introduction and Overview of e-Government in the Philippines. Retrieved from: http://dict.gov.ph/introduction-and-overview-of-e-government-in-the-philippines/

GOVPH. (n.d). Tadian Quick Stat. Retrieved from: https://www.dilgcar.com/index.php/2015-07-10-09-39-31/municipality-of tadian

Greenberg,Allan. (2005). ICTs for Poverty Alleviation: Basic Tool and Enabling Sector. Sida 2005. Retrieved from: http://www.eldis.org/fulltext/sidaictpoverty.pdf

Henson, Ronald. (2018). Methods of Research. Retrieved from: https://slideplayer.com/slide/10866021/

India School News. (2016). The Education Deficit Failures to Protect and Fulfill the Right to Education through Global Development Agendas Retrieved from: https://www.hrw.org/report/2016/06/09/education-deficit/failures-protect-and-fulfill-right-education-through-global

John, Surej. (2013). Influence of Computer Self-Efficacy on Information Technology Adoption. International Journal for Information Technology, Vol. 19 , No. 1. pp. 1-13

Kershaw, John. (2014). CK-12 Middle School Math – Grade 7. US: Flexbook.

Laberinto, Chistine Miles. (2019). How Ips and Agri Sector enhance English skills , increase farming productivity. The eMagazine of DICT, Vol 1, No. 1, p.11

Laberinto, Chistine Miles and Martinez, Hazel. (2019). ICT Programs and Digital Development of Liloan. The eMagazine of DICT, Vol 1, No. 1, p.12

Laberinto, Chistine Miles and Malunhao, Clea Mariel. (2019). How Technology

Upgraded the Services in Butuan City Public Library. The eMagazine of DICT, Vol 1, No. 1, p.14

Luan, Wong and Teo, Timothy (2009). Investigasting the Technology Acceptance among Students Teachers in Malaysia: An Application of the Technology Acceptance Model (TAM)

Macasaet, Jess Alfonso. (2013). Governance of the Education Sector. Retrieved from: http:// www.ombudsman.gov.ph/UNDP4/wpcontent/uploads/2013/01/Chap7.pdf

Majundar, Shyamal. (2012). Modelling ICT Development in Education. Retrieved from: https://unevoc.unesco.org/fileadmin/up/modelling_ict.pdf

Mariano, Marc Jim. et.al (2012). Factors influencing farmers' adoption of modern rice technologies and good management practices in the Philippines. Retrieved from: https://www.researchgate.net/publication/254408014_Factors_influencing_farmers'_adoption_of_modern_rice_technologies_and_good_management_practices_in_the_Philippines

Mathison, Stuart. (n.d) . Digital Dividendd for the Poor: ICT for Poverty Reduction in Asia. Retrieved from: https://www.google.com.ph/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwih6pHsysDMAhWIHaYKHa7PAjUQFggdMAA&url=http%3A%2F%2Funpan1.un.org%2Fintradoc%2Fgroups%2Fpublic%2Fdocuments%2FAPCITY%2FUNPAN020002.pdf&usg=AFQjCNFkaUKN6cObCTOFR8C673X7FtRqA&sig2=NfzV8nLAx8V9BwD6gf68Dg

Marchewka , Jack and Kostiwa, Kurt (2007). An Application of the UTAUT Model for Understanding Student Perception using Course Management Software. Retrieved from: https://www.researchgate.net/publication/228436638_An_application_of_the_UTAUT_model_for_understanding_student_perceptions_using_course_management_software

Metler, Craig (2014), Introduction to Educational Research, SAGE Publications . Retrieved from: https://edge.sagepub.com/node/23167/student-resources/chapter-7/chapter-summary

Michael, Oladunjoye Idowu and Samson, Audu Joel(2014). The Impact of Information and Communication Technology on Youth and its Vocational Opportunities in Nigeria. Retrieved from: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1061.6124&rep=rep1&type=pdf

Mitra, Sugatha. (2012). The Hole in the Wall Project and the Power of Self-Organized Learning. Retrieved from: https://www.edutopia.org/blog/self-organized-learning-sugata-mitra

NPR/TED Staff.(2013).How Much Can Children Teach Themselves? Retrieved from: http://www.npr.org/2013/06/21/179015266/how-much-can-children-teach-themselves

Oyedipe, Wuraola Janet and Popoola, Sunday (2019). Influence of Age, Job Status, ICT Literacy Skills and ICT Use on Task Performance of Library Personnel in Public Universities. Retrieved from: http://ijkcdt.net/xml/21160/21160.pdf

Park,Sung Youl. (2009). An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use e-Learning. Retrieved from: https://www.researchgate.net/publication/220374248_An_Analysis_of_the_Technology_Acceptance_Model_in_Understanding_University_Students'_Behavioral_Intention_to_Use_e-Learning

Peltier, L. and Youssef, A. (2015). Does internet speed matter? Impact of internet speed on e-applications adoption by firms in Luxembourg",. Retrieved from: http://unice.fr/laboratoires/gredeg/contenus-riches/documents-telechargeables/evenements-1/papiers-3en/ben-youssef.pdf

PhilAtlast (n.d.) Tadian, Mt. Province retrieved from: https://www.philatlas.com/luzon/car/mountain-province/tadian.html

Puspitasari,N. et al (2019). An Application of the UTAUT Model for Analysis of Adoption of Integrated License Service Information System. Retrieved from: https://www.researchgate.net/publication/338350643_An_Application_of_the_UTAUT_Model_for_Analysis_of_Adoption_of_Integrated_License_Service_Information_System

Reyes, Cecilia.(n.d). Information and Communication Technology in the Philippines. Retrieved from: https://docplayer.net/20997243-Information-and-communication-technology-ict-development-in-the-philippines.html

Sajan Venn yoor (2007). Solution Exchange ICT for Development Community Consolidated Reply. Retrieved from: http://portal.unesco.org/geography/en/files/8043/11975375305Setting_Up_and_Running_a_Community_Radio_Station.pdf/Setting%2BUp%2Band%2BRunning%2Ba%2BCommunity%2BRadio%2BStation.pdf

Saley, Juliet.(2007,January 5). Mt. Province forms council for Alleviation of Poverty. Retrieved from http://archives.pia.gov.ph/?m=12&sec=reader&rp=5&fi=p070105.htm&no=44&date

Senate of the Philippines. (2020). POE: Increase allocated budget to provide gadgets for teachers and students. Retrieved from: http://legacy.senate.gov.ph/press_release/2020/1123_poe1.asp

Statistic How To. (2014). Reliability and Validity in Research: Definitions, Examples.

Retrieved from: https://www.statisticshowto.com/reliability-validity-definitions-examples/

Subramanian, Girish. (1994). A Replication of Perceived Usefulness and Perceived Ease of Use Measurement. Decision Sciences; Sep-Dec 1994; 25, 5,6; ABI/INFORM Global pg. 863

Tarhini, Ali. Et.al. (2013). Factors Affecting Students' Acceptance of e-Learning Environments in Developing Countries: A Structural Equation Modeling Approach. Retrieved from: https://www.researchgate.net/publication/236902918_Factors_Affecting_Students'_Acceptance_of_e-Learning_Environments_in_Developing_Countries_A_Structural_Equation_Modeling_Approach

University of Arkansas. (n.d.). Literature Reviews. Retrieved from http://uark.libguides.com/c.php?g=78731&p=505552

University of Kentucky. n.d. Careers in ICT. Retrieved from: https://ci.uky.edu/sis/ict/careers

University of the West England (2020). Data Analysis. Retrieved from http://learntech.uwe.ac.uk/da/Default.aspx?pageid=1442

Vankatesh, Viswanath et.al. (2003). User Acceptance Of Information Technology: Toward A Unified View. Retrieved from: https://www.jstor.org/stable/30036540

Appendix A

Survey-questionnaire

Part I.

A. Age
B. Status

- ☐ HS Student
- ☐ College Student
- ☐ Teacher
- ☐ Government Employee
- ☐ Others

Part II.

Directions: Read each statement and put a checkmark (√) in the appropriate box.

4 – Strongly Agree
3 – Agree
2 – Disagree
1 – Strongly Disagree

Computer Self-Efficacy	4	3	2	1
1. I know how to use a computer.				
2. I often use the computer.				
3. I know how to fix computer problems.				
4. I know how to look for information online using the computer.				
5. I know how to produce content in different forms using the computer.				

Facilitating Conditions

	4	3	2	1
1. The Tech4Ed center is easily accessed by all residents.				
2. The facility has good internet connection.				
3. There is a continuous dissemination of information as regards to the Tech4Ed project.				
4. There is a training on the use of Tech4Ed.				

Perceived Usefulness

	4	3	2	1
1. Using Tech4Ed in my job/studies/business/personal use would enable me to accomplish tasks more quickly.				
2. Using Tech4Ed would improve my job/academic performance.				
3. Using Tech4Ed in my job/studies/business/personal use would increase my productivity.				
4. Using Tech4Ed would enhance my effectiveness on the job/studies/business.				
5. Using Tech4Ed would make it easier to do my job/studies/business.				
6. I find Tech4Ed useful in my job/studies/business.				

Perceived Ease of Use

	4	3	2	1
1. I found Tech4Ed easy to use.				
2. Learning Tech4Ed is easy for me.				

BEHAVIORAL INTENTION TO USE (Tech4Ed Adoption)

	4	3	2	1
1.I intend to use Tech4ed in the next days.				

Part III. What is/are the segment/s that you usually access? Select all that apply.

A. eAssist
B. eEduSkills
C. eGovServ
D. eMarket
E. eAgri

Appendix B

Focus Group Discussion interview transcript no need for this but use of the excerpts in explaining your survey results

Participants

Students	2
Teachers	3
Principal	1
DepED Representatives	2

Interviewer : What specific segments are you utilizing the most?

Teacher 1: Sa amin mas madali naming ginagamit yung eEduSkills kasi sa field naming TVL trucks ay hindi lahat ng skills matutunan diyan ay nakalagay sa reference book at tyaka parang may shortcut ang dating sa mga estudyante kaya ang ginagamit namin ay Tech4Ed for enter program para yun doon sila magreresearch. Research more on that and of course , they will be equipped with sufficient knowledge and skills on that program.

DepED Representative 1: Dito kasi ma'am sa platform na ito, especially the eEduSkill segment ma'am, meron iyong page mount on for day on for day library, so iyong school din kasi natin recipient siya ng star books so offline po iyan and with this Tech4Ed na online, we have the Rotary e-library so hindi po pareho iyong nasa starbooks at tiyaka sa Rotary Library kaya mas nadadagdagan kung anuman ang meron sa library nila kasi nakakadagdag siiya sa refereces especially for the senior high school. Maraming references doon ma'am na pwedeng ng teachers natin.

Teacher 2: Adding to that is we usually encounter problems on references especially the TVL, where these people, TVL teachers don't have really books so the you-solve is a Tech4Ed. For them, it's really useful in the sense na they come here and update themselves and get praise theory, where they can really facilitate in the classroom.

DepED Representative 1: Although we have to say na references kasi very wide naman po iyong internet atin ma'am but with this Tech4Ed platform ma'am kasi , the reliability and the credibility of the sits,natingnan na po ng DICT so for us, confident kami iyong nakukuhang resources naman dito is nareview po siya kasi iyong sa internet naman po meron din naman pong poor references na nakukuha na at times misleading po siya. Although we're not limiting ourselves, may ibinibigay din tayong ibang pwedeng pagkuhanan ng references kasi iyang objective natin atleast mabigyan sila ng maraming referece para hindi macontain iyong learning ng bata sa Mountain Province. With that, nakikipaglink din kami sa mga ibang partners din na willing din pong ipagamit ang mga services nila.

Student 1: Ma'am eEduSkill po kasi meron po doon iyong cellphone repair na class kaya iyon po ang ginagamit naming.

Student 2: Nakakatulong po ang eEduSkill dahil meron iyong section na food and beverage. May tutorial po siya tungkol sa waiter servicing. Nakakatulonng din po ito para maexpand naman po iyonng kaalaman naming sa mga ganitong bagay.

DepED Representative 1: Iyong binabanggit po kasi nila ma'am na pages actually nilink niya sa side ng TESDA so buong course po siya for each specialization so pwedeng i-start ng ealier time mula sa preliminary topic hanggang sa advanced so pagnatapos nito ang isang course, actually pwede na silang magrequest for

certification but of course , first is assessment iyon ng mga actual demo ng mga teacher natin so parang iyong videos, supplemental doon sa ginagawa nga teachers natin na actual demo po.

Interviewer: What are the challenges encountered in using the platform?

DepED Representative 1: Iyong strength ng internet natin. The good thing is meron naman po itong upcoming projects ng DICT na magcocompliment din naman po ditto sa program nila accordingly.

Principal: In our part of managing the school, for us this is developmet so our long term goal is to promote really this system so that it should be sustained sana kasi of course, looking at the economic situation of the community of the town, where it's really hard for us. The internet alone is costly while if we have this, of course it will help. So first we have to promote it and provide sana a way of marketing it. Ang problema natin sa ngayon is that if we could hire someone and manage this Tech4Ed so that it will be really marketed to the public.

Interviewer: What are your assessment of the platform?

Teacher 3: To me, this is a something that is to be developed, to be enhanced , to be maximized if possible so that it will cater to the needs of the public.

Student 2: As a student, it is actually effective and useful but for me it still needs more improvement, wider data base for all the students to use.

DepED Representative 1: Plano ng DICT na i-update o i-upgrade ang mga content kasi ina-acknowledge naman din po nil ana some of the contents ay kailangan naman pong i-update like for instance the ALS. Noong ipinakita natin iyong ALS for the students and teachers, they said na they need some updating so sabi naman ni DICT, iyon po ang plano nila. I-update ang mga content so hindi sila magstop diyan sa limang segments Actually, ang balak nila ay "one stop shop". Nandiyan po lahat ng services.

Interviewer: Why is the center located inside the school?

DepED Representative 1: Iyong recipient po kasi noong time na iyon ay initially LGU's po when we heard about the program ,Nakita natin ang isang segment, skills, doon po tayo nagkainteres so we offered to DICT resources na meron sa school and ito iyong binibigay ng central office through the DepEd computerization program. Iyong agreement kasi Ma'am , ipoprovide po kasi ng recipient iyong hardware. Ibibigay naman ng DICT iyong software.

Principal: Assets ng community are in this school.

Interviewer: Since the center is established inside a school, is accessing it a problem?

DepEd Representative 1: Hindi naman po limitado lang ang pwedeng gumamit ng center kasi nakapagconduct na po kami ng training sa barangay secretaries. Although yung main clients of the center are students and learners but open po ito sa lahat.

DepEd Representative 2: All the schools are encouraged to establish partnerships with all the sectors in the community and we have good partnerships with the LGU so it does not actually limit the community from coming to the center. Only we have to maybe broaden the advocacy for this facility. Since we have the computers, that's the reason why schools were chosen as the recipient. Later on, we look forward to having similar centers and we will seek the support of LGUs so that we can also have other center which is more open to the community. But the community is invited to come to the center. The advocacy part should be strengthened so that more people will be aware especially after the training of barangay secretaries.

Interviewer: What are your recommendations to improve the platform?

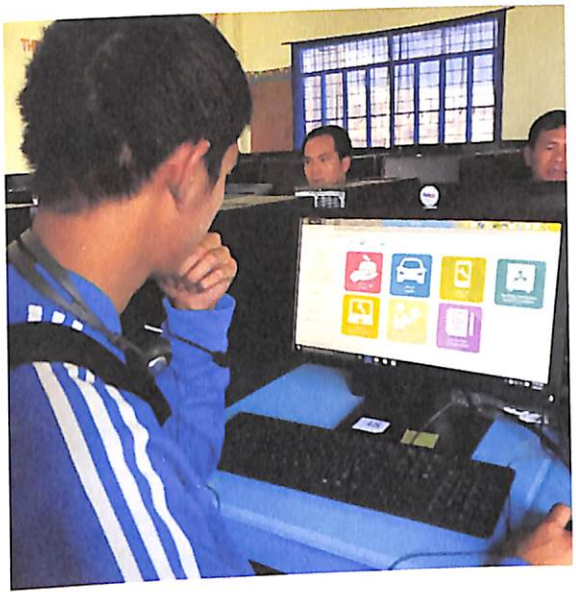
Student 2: I just like to add na sana hindi lang po siya focused doon sa skills, sana sa academic subjects meron din po.

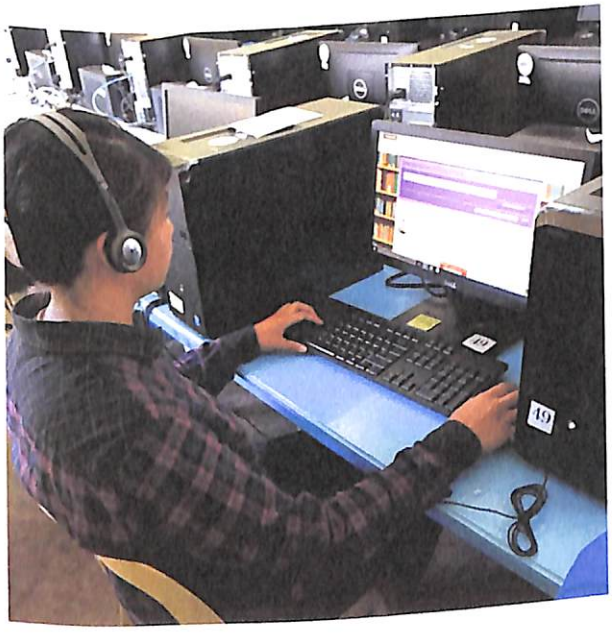
DepED Representative 1: Content updating

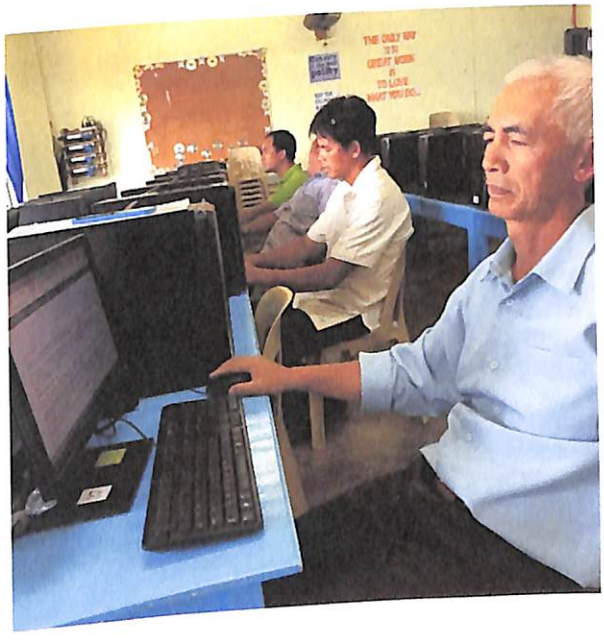
Teacher 1: Improve internet connectivity

Appendix C

Below are the photos of the Tech4Ed users at Tadian Schools of Arts and Trades.







Below are the photos during the focus group discussion