

Research Article

Education Students' Challenges in Using Digital Technologies for Online Learning: Basis for Institutionalization Plan

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ABSTRACT

The study aimed to reveal the challenges experienced by the education students in using digital technologies with the end phase of developing an institutionalization plan. The utilization and integration of information and communication technologies (ICTs) in the field is already critical to prepare the learners to be competent and skilled individuals for the 21st century's opportunities and challenges. However, various challenges and gaps arise because of the differences between and among the various stakeholders' preferences, capabilities, privileges, and affordances to digital technologies. It was even more intensified by the COVID-19 pandemic, where tertiary education institutes shifted to an online learning delivery modality. From the literature review, the researcher summarized the five factors that influenced the challenges of using digital technologies in education. Those are the availability and physical access to up-to-date devices and infrastructures; geographical location and community type; income, poverty, and socio-economic status; level of education and digital literacy skills of teachers; and motivation, engagement, and interest. These five (5) main factors have been the basis for crafting the interview questions administered to 20 second-year education students. Interview data were analyzed, and four themes emerged to generalize the challenges experienced by the students: (1) unavailability and physical inaccessibility to digital technologies, (2) poor internet connection relative to residence, (3) low socioeconomic status and inaccessibility to digital technologies, and (4) disengagement in using digital technologies. The four themes became the basis used in crafting the institutionalization plan.

INTRODUCTION

In the century where digitization has been the trend to improve the production of goods and quality of services, different aspects of life are influenced by digital technologies. Victoria State Government Education and Training (2019) defined digital technologies as electronic tools, systems, devices, and resources that generate, store, or process data. Accordingly, it includes social media, online games, multimedia, mobile phones, computers, software applications, and the internet.

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At the onset of the COVID-19 pandemic, higher education institutions (HEIs) maximized the utility and benefits of technology to serve as an alternative delivery mode for online learning. However, gaps and challenges are more evident in online learning because of the different privileges and backgrounds of the diverse types of students.

This study sought to reveal the challenges experienced by education students in using digital technologies and develop an institutionalization plan to address them. Specifically, it would answer the following questions:

1. What are the challenges experienced by the education students in using digital technologies for online distance learning?
2. What action plan can be crafted based on the challenges encountered by the education students in using digital technologies?

MATERIALS AND METHODS

The study was conducted at the School of Teacher Education in the College of Sciences, Technology and Communications, Inc. (CSTC), Sariaya, Quezon where the researcher is a part-time teacher. The respondents were comprised of 20 second-year students of the academic year (A.Y.) 2021-2022. Five (5) from each of the four programs, namely, BPEd, BSEd-Filipino, BSEd-Mathematics, and BSEd-Social Studies, volunteered to participate in the study based on their experienced challenges in online distance

learning as reflected by their performance during the initial term.

Qualitative methods of research were used in conducting this study. The interview protocol was used to determine the challenges experienced by the education students in using digital technologies for online learning. The interview guide administered was composed of five (5) open-ended questions related to the factors influencing the digital gaps and challenges in education, namely (1) availability and physical access to up-to-date devices and infrastructures, (2) geographical location and community type (access to the internet), (3) income, poverty, and socio-economic status, (4) level of education and digital literacy skills of teachers, and (5) motivation, engagement, and interest.

The interviews' responses were transcribed and coded through descriptive and open coding to support the themes and subthemes initially identified in the literature review. Results that were interpreted and analyzed qualitatively became the basis for developing the institutionalization plan to address the identified challenges.

RESULTS AND DISCUSSION

The PIDS or Philippine Institute for Development Studies (2020) cited the definition of OECD (2001) that digital divide refers to the "gap between individuals, households, businesses, and geographic areas at different socio-economic levels about both their opportunities to access information and communication technologies (ICT) and to their use of the Internet for a wide variety of activities."

Along with any other country, the Philippines has been experiencing the challenge of the digital divide, causing the gap between those privileged and under-privilege, ranging from simple use and access to the essential means of communication and information resource for education and skills and tools necessary for employability. In these times of pandemic, the gaps and challenges became more apparent, especially in tertiary education, which generally relies on online learning delivery.

This paper will reveal the challenges experienced by the education students in using digital technologies for online distance learning. Based on the challenges revealed by the respondents, an institutionalization plan to address them was developed.

Challenges in Using Digital Technologies

Theme 1 – Unavailability and Physical Inaccessibility to Digital Technologies

The availability of the infrastructure predicts the likelihood of the adoption and the extent of the use of ICT (Srinuan & Bohlin, 2011). It includes related technologies like fixed phones, mobile phones, computers, and wi-fi (Middleton and Chambers, 2010 Varallyai et al., 2015).

Table 1. Emerging Subthemes on the Unavailability and Physical Inaccessibility to Digital Technologies

Subthemes	Coded Response
Available device for personal use	Basic phone only (1)
	Smart phone only (11)
	Smart phone and computer/laptop (8)
Quality of performance and device specifications	Poor performance, old and outdated (12)
	Middle quality, average specifications (2)
	Good quality and specifications (6)

As seen in the table above, two subthemes emerged in the availability and physical access to digital technologies: the available device for personal use, and the quality of performance and device specifications.

For subtheme 1 – available device for personal use, more than half of the respondents rely alone on the use of smartphones for online learning. Meanwhile, it was revealed in subtheme 2 – the quality of performance and device specifications that most students are using digital devices with poor performance, old and outdated. Hence, in general students has access in the use of personal smartphones but of low-quality performance.

The results above align with the National ICT Household Survey 2019 (NICTSH), the first and latest national survey in the Philippines that examines the country’s progress on ICT on both a household and an individual level. Among the 2013 Master Sample of the PSA with 43,838 sample households, 82 % still have no access to the internet while 24% still is using cellular phones on communal basis.

According to Steele (2019), jobs will require an individual to have computer skills, and students need modern devices such as chrome books, laptops, and tablets for advanced learning. She added that at-risk students who lack the necessary technology lag in their studies and suffer from poor grades. This means a low level of competencies and skills they will develop, which are necessary for the career path they are about to take.

Theme 2 – Poor Internet Connection Relative to Residence

Table 2. Categories and Codes on Poor Internet Connection Relative to Residence

	Category-Code	Coded Response
The internet connection...	Near the town proper	Slow (3)
		Unstable, sometime fast, sometimes slow (1)
		good (4)
	Away from the town proper	Poor, bad (5)
		Unstable, sometime fast, sometimes slow (3)
		Good when wired connection (2)
	Expensive (2)	

Urban populations may benefit from easier and cheaper access to ICT infrastructure because adoption costs will decrease with population size and density increase (Struzak, 2010 Srinuan & Bohlin, 2011; and Varallyai et al., 2015).

It is quite alarming on the table above that even on near the town proper, the internet connection speed is equally slow-unstable and good. Maryville University (n.d.) explained this phenomenon in the Philippine context, the Philippines. From a larger geographical perspective, a country with low economic development, including Philippines, lacks the technology and infrastructure necessary for high-speed internet connections.

For the students living in the rural areas, those far from the town proper experienced poor and unstable internet connection speed, while the remaining one-thirds can get sufficient speed for wired connection but at a high price.

As urban centers are progressively building high-speed broadband networks like cable, digital subscrib-

er line (DSL), fiber, and satellite connections, many rural and remote areas are neglected because the cost and difficulty associated with wiring the rural locations are often expensive and prohibitive (Dondiego, 2016).

Caumont (2013) specified that if one lives in a rural area with limited broadband access, he/she is less likely to use the internet than an urban or suburban resident, accordingly, the difference between the number of offline users in urban and suburban-rural areas is not less than 5% which is significant enough given the volume of the population in the area.

Bliss et al. (2014) explained that this limited broadband access in rural areas might be associated with higher costs for providing services; because fewer people live in rural areas, the laws of supply and demand establish more connections in these rural regions, an unprofitable enterprise.

Theme 3 – Low Socioeconomic Status and Inaccessibility to Digital Technologies

A person or country in a better socioeconomic position is likely to have a smaller digital divide (Srinuan and Bohlin, 2011; Varallyai et al., 2015). The gaps and challenges in using digital technologies are primarily caused by poverty. In a world where the rich get richer, and the poor get poorer, developing countries will most likely be unable to secure adequate funds to purchase telecommunication infrastructure and equipment (Dondiego, 2016).

Table III presents how socioeconomic status great-

ly affects the privilege and affordances of using digital technologies. Low-income families' access is limited since the students either shoulder the cost, incur additional expense beyond the budget, or sacrifice other expenses. It cannot be availed because of budget insufficiencies.

Table 3. Categories and Codes on Low Socioeconomic Status and Inaccessibility to Digital Technologies

	Category-Code	Coded Response
Access to digital technologies in...	Low-income families	is paid by the students their own (4)
		incur additional expense (3)
		sacrifice other expenses (4)
		cannot be availed because of insufficient budget for basic needs (5)
	Middle-income to High-income families	has no significant effect to budget (1)
		would not be possible if the family income was not sufficient enough (2)

The results are supported by the claims of Caumont (2013) and Bliss et al., (2014). They mentioned that those living in a high-income household are much more likely to use the internet and higher-income brackets showed a significant statistical likelihood of internet and email users compared to those in other income brackets with the same factors.

It is also aligned with the results of the study by Schumacher and Kent (2020), where they discovered that the difference in the use of digital technologies in the Philippines between the people with lower income and higher income was 19%.

Steele (2019) provided a more comprehensive view of how the income gap plays a considerable role in magnifying the digital divide. It is common sense that high-income earners are more likely to access the internet than low-income earners. Similarly, wealthy families are more likely to own computers and have a high-speed internet connection at home than those low-income families.

Steele (2019) highlighted that money is scarce for low-income people, and their purchasing power is

limited. Their revenues are used to meet basic needs, so they tend to regard technology as a luxury rather than a necessity. On a global scale, she stated that most developing countries focus on technical education yet generate half-baked graduates due to insufficient training caused by limited research capabilities, exacerbated by the lack of internet access and training equipment.

Theme 4 – Disengagement in Using Digital Technologies

A favorable attitude towards ICT will influence the adoption of ICT. Srinuan and Bohlin (2011) concluded three main points how the motivation, engagement, and interest in the use of ICT: (1) content suited to the preferences and needs of the user will decrease the digital gap; (2) English language is a potential predictor of the digital divide, in particular for the Internet; and, (3) persons belonging to different cultures may have different perceptions of ICT, which will lead to different ICT adoption rate.

Some people have the financial means, abilities, and knowledge to use the internet. Still, they are uninterested in learning how to use digital gadgets and reaping the benefits of the internet (Maryville University, n.d.).

Table 4. Categories and Codes on Disengagement in Using Digital Technologies

	Category-Code	Coded Response
Engagement level in using digital technologies is...	Affected by age	Millennial students learn faster (1)
		Gen Z are more technology dependent (1)
		People at my age are interested in using it (2)
	Affected by English language proficiency	Easy to understand instructions in English language (2)
		Affects performance in class (2)
		Hard to communicate using second language (4)
Not affected by age, language proficiency and disability (8)		

From the review of literature conducted, it can be delineated that some of the reasons why motivation, engagement, and interest to use digital technologies among individuals vary because of disability, age, and language.

However, the Table IV above which summarizes the information obtained from the respondents, discovered only two persisting factors which affects the engagement level in using digital technologies, such as age and English language proficiency.

Based on the analysis of interview findings, students still considered age as one of the determinants of the engagement level of digital technologies. It is parallel to the results of the study conducted by Zickuhr (2011), where he found that age is an important factor influencing the ever-widening digital gap. According to 2013 Pew research data, older individuals are much less likely to use the internet than younger people. The study revealed that the main reason why a considerable number of adults do not use the internet and digital technologies is that they do not consider it relevant.

Institutionalization Plan to Address the Digital Divide

With thematic analysis results, the school, in cooperation with the local government unit and other stakeholders, should develop several Projects, Programs and Activities (PPAs) to deal with the ever-widening digital gaps and challenges in education worsened by the health crisis.

The table on the next page presents the institutionalization plan to address the challenges identified. The contents were based on the results of this study.

Table 5. Institutionalization Plan for the Development of PPAs to Address Challenges Experienced

Phases of Institutionalization	Goals/Objectives (problem to deal with)	Persons Responsible/Involved	Timeframe	Outputs
I. Pre-Implementation Phase A. Community of Practice (COP) & Focus Group Discussion (FGD) (Conceptualization of the Different PPAs to deal with the Challenges Identified) B. Orientation (Orientation and Introduction of the PPAs)	To distribute and delegate individuals responsible for certain tasks To establish and strengthen partnerships with the local government unit, non-government organizations, and other stakeholders	Dean, Instructors, Students, and Parents Barangay Council, LGU Officials and other stakeholders	December 2021-January 2022	1. Committee Delegation 2. Documentation 3. Memorandum of Agreement/Understanding (MOA, MOU)
II. Implementation Phase A. Gadget/Device Lending (includes screening of recipients, distribution of package and monitoring of usage) B. Learning Hub & Free Wi-Fi Hotspot per Barangay (identifying points for the installation of facility and monitoring of effective utility) C. Peer Assistance (pairing of students for buddy system monitoring and assistance – considering that the pair should be one technologically knowledgeable and one technologically challenged)	(availability and physical access to up-to-date devices and infrastructures; income, poverty, and socio-economic status) (geographical location and community type (access to the internet); income, poverty, and socio-economic status) (engagement difference in terms of age and language proficiency)	Dean, Instructors, Students, and Parents Barangay Council, LGU Officials and other stakeholders	January-May 2022	1. Assessment tool for screening recipients 2. Distribution form and oath of responsible usage 3. Visitors' log for Free Wi-Fi and learning hub access 4. Feedbacks from peer/partner
III. Post Implementation Phase	To evaluate the support the success of PPAs	Dean, Instructors, Students, and Parents Barangay Council, LGU Officials and other stakeholders	May-June 2022	1. Analytics 2. Improvement Plan

CONCLUSION AND RECOMMENDATIONS

Among the five (5) factors identified that affect the digital gap in education, only four prevailed based on the analysis of the answers of the respondents. Thematic analysis through open and descriptive coding revealed that the challenges experienced by the education students in online distance learning modality are: unavailability and physical inaccessibility to

digital technologies; poor internet connection in residence; low socioeconomic status and inaccessibility to digital technologies; and, disengagement in using digital technologies. Meanwhile, the teachers' level of education and digital literacy skills shows no significant perception among the student-respondents.

The four emerging themes served as the basis used in crafting the institutionalization plan. Three of the possible PPAs which can be implemented were mentioned, (1) gadget device lending, (2) learning hub/wi-fi hotspot establishment and (3) peer assistance. The first two suggested PPAs will address the prevailing problem regarding socioeconomic status and access to digital technologies. The first one specifically address the availability and physical access to digital technologies. While the second is on the access to internet relative to residence. Engagement difference in terms of age and language proficiency can be addressed meanwhile through the peer assistance.

To further improve this study, it is recommended to conduct an evaluation relative to the implementation of the PPAs based on the institutionalization plan. Similar study can also be conducted in different level of education.

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