

DIGITAL DIVIDE AMONG EDUCATION TEACHERS IN NORTHEASTERN COLLEGE OF SANTIAGO CITY

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ABSTRACT

This study examines the critical role of Information and Communication Technologies (ICTs) as instrumental agents for fostering economic growth and enhancing social development. It delineates the phenomenon of the digital divide, which emerges as a paramount concern for international organizations and constitutes a significant challenge for both policymakers and academic scholars. The research adopts a quantitative methodology to investigate the disparities in digital access among educators at Northeastern College, Santiago City, employing a comprehensive survey and structured interviews to collect data from all education faculty members within the institution. Utilizing statistical analyses, specifically Simple Frequency, Percentage Count, and Weighted Mean, the study elucidates the multifaceted obstacles encountered in the integration of ICT within educational frameworks. These include issues related to the acceptance, sustainability, and scalability of initiatives designed to enhance classroom technology infrastructure and augment teacher proficiency in technology usage. Among the myriad challenges identified, achieving digital equity stands out as the most daunting task, necessitating a concerted effort to bridge gaps among students, educators, and administrative bodies. The discourse underscores the necessity for equitable access to digital technologies as a precondition for leveraging the potential of ICT in education. It advocates for the formulation and implementation of policies and initiatives aimed at ensuring comprehensive ICT accessibility for both teachers and students. The study posits that such equitable access is fundamental to realizing the full educational benefits of digital technologies, thereby contributing to the overarching goals of economic development and social progress.

Keywords: Digital Divide, Information Communication Technologies

INTRODUCTION

The advent and proliferation of Information and Communication Technologies (ICTs) have been identified as significant contributors to economic expansion and societal progress. The dissemination of ICTs facilitates unprecedented access to information and knowledge. However, the disparate distribution of these technologies

across and within societies can lead to pronounced disparities in economic development and wealth distribution. Following the publication of the seminal report 'Falling Through the Net' in the late 1990s by the NTIA (1995, 1998, 1999, 2000), not only the United States but also other nations, both developed and developing, have acknowledged the imperative to address and

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mitigate the disparities in ICT access, known as the digital divide.

This digital divide has emerged as a crucial concern for numerous international entities, presenting a complex challenge for policymakers and scholars alike. Initial discourse on the digital divide was characterized by a broad and somewhat nebulous use of the term, encompassing disparities in access to ICTs in general and the Internet in particular. Since the late 1990s, there has been a concerted effort within academic and policy-making circles to refine the definition of the digital divide, focusing on access to and utilization of ICT, as evidenced by the works of scholars and organizations such as van Dijk (2002, 2003, 2006), Norris (2001), and the OECD (2001). These analyses highlight the existence of digital divides both within countries and between them, prompting efforts to foster societies where all citizens can access and share information through supportive policy frameworks aimed at narrowing the digital gap.

The integration of ICT into education has been shown to have positive effects on students, teachers, and educational institutions alike, becoming an integral component of educational processes with a recognized impact on teaching and learning methodologies (Youssef et al., 2013; Mahmood, 2009). Research has documented the successful deployment of technology by K-12 teachers to enhance instructional practices, curriculum supplementation, and the development of innovative teaching and learning approaches (Ertmer et al., 2012). Moreover, the emergence of Web 2.0 technologies has further facilitated collaborative learning, underscoring the importance of access to digital tools for communication and collaboration in educational contexts (Goh & Kale, 2015).

Ertmer and colleagues (2012) suggest a duality in the application of technology in education, encompassing both teacher-centered and student-centered approaches, thereby facilitating a dynamic and interactive learning environment. This highlights the important role of educational institutions, particularly universities and higher education institutes, in cultivating a

skilled workforce essential for the knowledge society. The effective utilization of ICT across all sectors is crucial for societal development, predicated on widespread access to digital technologies and the acquisition of digital skills.

In the context of the Philippines, the COVID-19 pandemic has expedited the adoption and utilization of digital technologies. Nonetheless, the country faces significant challenges due to low high-speed broadband penetration compared to its regional counterparts, contributing to a considerable digital divide, with nearly 60% of households lacking internet access. Previous research has predominantly focused on students' access to ICT, with limited exploration of teachers' access levels, particularly among basic education faculty in developing countries. This study seeks to address this gap by examining the access of private education teachers to ICT across motivational, physical, skills, and usage dimensions and exploring disparities in access based on demographic and professional factors, as well as the instructional applications of ICT and various sub-levels of access.

OBJECTIVES OF THE STUDY

This study aimed to 1) determine the Ability to Operate Digital Devices of the respondents, 2) evaluate the the engagement with the activities to support instructional practices.

METHODOLOGY

To gain insight into the digital divide among Teachers of Northeastern College education teachers in Santiago City, the researcher a quantitative approach where all the teachers in Northeastern College Santiago City were the respondents of the study. Participation in this study was completely voluntary.

In gathering the data and information needed for the study, the following instruments were used: Questionnaire which was a self-administered paper survey to record participants' responses. The researcher used the 5-point Likert



scale to give meaning to the data to be gathered. A Structured interview was also utilized by the researcher in gathering data.

The researcher sought permission to conduct the study from the School Principal. After getting permission, the researcher sought the Principal's approval for the researcher to contact the learners. The questionnaires were collected personally by the researcher to ensure a 100 percent retrieval. All the data gathered were tallied, tabulated, computed, analyzed, and interpreted.

The researcher used the following statistical tools: Simple Frequency and Percentage Count to treat the data for constructs of interest including motivational access, physical access, skills access, usage access, and some demographic variables such as age, gender, teaching position, and teaching experience. Weighted Mean was used for finding the average of responses to opinions or items of the questionnaire which were given weights.

RESULTS AND DISCUSSION

1. Profile of the Respondents

1.1. In terms of Gender

Table 1
Gender

Gender	Frequency	Percent
Male	5	25.0
Female	15	75.0
Total	20	100.0

Most respondents are female teachers. 15 or 75.00 percent out of the 20 respondents are women while only 5 or 25.00 percent are men. This means that the majority of teachers in Northeastern College Santiago City are women.

In examining the inequalities of access to information and communication technologies, researchers found that traditional demographic

variables such as age, gender, ethnicity, and socioeconomic status are the main factors for the digital gap (Alampay, 2006; Ritzhaupt et al., 2013; van Dijk, 2005).

1.2. In terms of Age

More so, 12 or 60.00 percent of the respondents are 30 years or younger. While 6 or 30.00 percent of them are 51 years old and above. Only 2 or 10 percent are under the age bracket 41-50 years of age. Data reveal that most of the teachers are millennials and are considered digital natives or those who are born and grew up using technology.

Table 2
Age

Age	Frequency	Percent
30 Years or Younger	12	60.0
41 to 50 Years	2	10.0
51 Years or Above	6	30.0
Total	20	100.0

In examining the inequalities of access to information and communication technologies, researchers found that traditional demographic variables such as age, gender, ethnicity, and socioeconomic status are the main factors for the digital gap (Alampay, 2006; Ritzhaupt et al., 2013; van Dijk, 2005).

1.3. In terms of Years in Teaching

In terms of teaching experience, the teachers have been teaching either 6-10 or 11-15 years which received a total of 10 responses or 25.00 percent each respectively. This is followed by teachers with 21-25 years or 20.00 percent of teaching experience. The data manifest that the teachers have been teaching for more than a decade.



Table 3
Years in Teaching

Years in Teaching	Frequency	Percent
0 to 5	2	10.0
6 to 10	5	25.0
11 to 15	5	25.0
16 to 20	2	10.0
21 to 25	4	20.0
More than 25	2	10.0
Total	20	100.0

1.4. In terms of Access to ICT

Table 4
Access to ICT

ICT	Number of Teachers		Percentage of Teachers	
	Home	School	Home	School
1. Desktop computer	7	5	35.00	25.00
2. Laptop computer	9	3	45.00	15.00
3. Broadband/DSL Internet	9	13	45.00	65.00
4. USB Flash drive/memory stick	8	5	40.00	25.00
5. iPad/tablet	3	0	15.00	0.00
6. Webcam	10	0	50.00	0.00
7. Printer	5	7	25.00	35.00
8. Office Software	8	8	40.00	40.00
9. Photo editing software	6	3	30.00	15.00
10. Video editing software	4	2	20.00	10.00
11. Statistical software	2	1	10.00	5.00
12. Learning management system	11	5	55.00	25.00

Among the ICTs accessed at home, the Learning Management System ranked 1st with 11 responses or 55.00. Rank 2nd is the webcam with 10 or 50.00 responses. Tied in Rank 3rd are

Laptop/computer and Broadband/DSL with 9 or 45.00 percent responses respectively. The least accessed at Home are Statistical software (2 or 10.00 percent), Video editing software (4, 20.00 percent), and Photo editing software (6, 30.00 percent). When the teachers are asked about their responses with high scores, they said that they are pushed to have access to the said ICTs, especially during lockdowns where they meet their classes online.

Meanwhile, concerning ICTs accessed in Schools, rank number 1 is Broadband/DSL internet with 13 or 65.00 percent. This is followed by Office Software with 8 or 40.00 percent responses. Rank 3 was the Printer with 7 or 35.00 percent. The least accessed at School are iPads/tablets and webcams (0 responses) and Statistical software (1 or 5.00 percent). The teachers complained of the lack of ICTs they can have access to in School.

2. Endogenous and Exogenous Motivation

2.1. Endogenous and Exogenous Motivation

Table 5
Endogenous Motivation

Exogenous Motivation	Level of Agreement	Descriptive Rating
1. Seeing other teachers using computers and the Internet inspires me	4.75	Strongly Disagree
2. I want to use ICT because my superiors expect me to use it	3.20	Neutral
3. I wish to use computers and the Internet because my students think that I should use them	4.20	Strongly Disagree
4. I am interested in adopting digital technologies because my school provides enough technology support	2.90	Neutral
5. I have enough time to learn and use digital technology	2.55	Disagree



Table 6
Exogenous Motivation

Endogenous Motivation	Level of Agreement	Descriptive Rating
1. Using the Internet can provide me with information that would lead to better decisions	4.00	Agree
2. Using ICT will be of no benefit to me	1.85	Disagree
3. Using a computer and the Internet can improve my work performance	4.90	Strongly Agree
4. Using a Computer and the Internet seems to be enjoyable	4.75	Strongly Agree
5. Using computers and other digital technologies fits into my work style	4.35	Strongly Agree

In terms of Endogenous Motivation, the respondents strongly agree that using computers and the Internet can improve their work performance with a mean of 4.90. Another motivation is that according to the respondents, using computers and the Internet seems to be enjoyable which received a mean of 4.75. The teachers also believe that using computers and other digital technologies fits into their work style with a mean of 4.35. Meanwhile, in about Exogenous motivation, the teachers strongly agreed that computers and the internet inspire them with 4.75 as the mean rating.

The results coincide with Van Dijk who argues that access to ICT here does not mean having only physical access to digital technologies. But it also indicates some other types of access including their motivation to adopt ICT; their capabilities to utilize these technologies; and getting time, opportunity, or need to utilize ICT (van Dijk, 2005). Access to ICT alone does not assure development in society, but it is people's reaction that matters once they get access to emerging technologies (Alampay, 2006)

3. Abilities to Operate Digital Devices

Among the items under Abilities to Operate Digital Devices, it can be noted that only in item number 2, "I feel difficulty to change some basic

computer settings (wallpaper, time/date, sounds, etc.)" that the teachers agree on with 4.10 as its mean. The items, "I feel comfortable in creating and editing a text file in a word processing program" (2.70); "It is easy for me to create a computer presentation" (2.70); "I feel confident to download programs from the internet" (2.70); "I know enough about transferring files from hard disk to a USB flash drive and vice versa" (3.20) all received a descriptive rating of "neutral". Meanwhile these items: "I can save images and text from the website on the hard disk" (2.45); "I can send an attachment with an email" (2.55); "I can use spreadsheets to compute basic formula (e.g., sum, average, percentage)" (2.45) all received a descriptive rating of "disagree".

Table 7
Abilities to Operate Digital Devices

Abilities to Operate Digital Devices	Level of Agreement	Descriptive Rating
1. I feel comfortable creating and editing a text file in a word processing program	2.70	Neutral
2. It is easy for me to create a computer presentation	2.70	Neutral
3. I feel difficulty changing some basic computer settings (wallpaper, time/date, sounds, etc.)	4.10	Agree
4. I can save images and text from the website on the hard disk	2.45	Disagree
5. I feel confident to download programs from the internet	2.70	Neutral
6. I can send an attachment with an email	2.55	Disagree
7. I know enough about transferring files from a hard disk to a USB flash drive and vice versa	3.20	Neutral
8. I can use spreadsheets to compute basic formulas (e.g., sum, average, percentage)	2.45	Disagree

The results are very alarming since, even though the teachers are motivated to use the ICTs their skill to use them is questionable. It seems there is a mismatch between their motivation and their abilities. This requires that everyone needs to



have physical access to various ICTs and to equip themselves with digital skills, thus the digital divide.

4. Abilities to use a computer and the Internet in reaching goals

Regarding the ability to use the computer and the Internet to reach the respondents' goals, the results are disturbing. Only two items, "I feel confident in making important decisions with the help of the Internet" (3.20); and "I can make a choice by consulting the Internet" (2.70) received a "neutral" response. The rest of the items received negative ratings: I can reach my intended goal while using the Internet (1.95, Disagree); On the Internet, it is easy for me to work toward a specific goal (1.75 Strongly Disagree); I can gain benefits from using the computer and the Internet (2.55 Disagree); I feel confident in making important decisions with the help of the Internet (1.95 Disagree).

Table 8
Abilities to use a computer and the Internet in reaching goals

Abilities to use computer and the Internet in reaching your goals	Level of Agreement	Descriptive Rating
1. I can make a choice by consulting the Internet	2.70	Neutral
2. I can reach my intended goal while using the Internet	1.95	Disagree
3. On the Internet, it is easy for me to work toward a specific goal	1.75	Strongly Disagree
4. I can gain benefits from using computer and the Internet	2.55	Disagree
5. Using various ICT tools, I feel confident in achieving my goals	1.95	Disagree
6. I feel confident in making important decisions with the help of the Internet	3.20	Neutral

The results coincide again with Van Dijk who argues that access to ICT here does not mean having only physical access to digital technologies. But it also indicates some other

types of access including their motivation to adopt ICT; their capabilities to utilize these technologies; and getting time, opportunity, or need to utilize ICT (van Dijk, 2005).

5. Engagement with the activities to support instructional practices

The Science teachers despite their motivation and age are skeptic in the use of ICTs for instruction purposes since only two items received a neutral response; I use ICT for communication about assignments among students (3.05); and I use ICT to improve students' problem-solving skills (2.70). The rest of the items received negative responses. The results oppose the claim on the positive influence on teaching-learning processes is widely acknowledged (Mahmood, 2009).

Table 8
Engagement with the activities to support instructional practices

Engagement with the activities to support instructional practices	Level of Agreement	Descriptive Rating
1. I use ICT for communication about assignments among students	3.05	Neutral
2. I use ICT to enhance students' content learning	1.95	Disagree
3. I create a test, quiz, or assignment using the computer	2.55	Disagree
4. I use ICT to facilitate students' group work	1.50	Strongly Disagree
5. I use ICT to improve students' problem-solving skills	2.70	Neutral
6. I use digital technologies for the delivery of my instruction	2.55	Disagree
7. I use digital technologies to communicate with students	1.50	Strongly Disagree
8. I prepare learning materials using computer and internet resources	2.55	Disagree
9. I develop critical thinking skills among students with the help of ICT	1.50	Strongly Disagree
10. I use ICT to encourage peer feedback among my students	1.50	Strongly Disagree



Teachers in other context successfully use technology in their instructional practices for content delivery, reinforcement of students' skills, complementing the curriculum, and transformation – experimenting, implementing, and refining of new approaches to teaching-learning (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012).

Another credible characteristic of emerging technologies for other teachers is their use for collaboration, which transforms learning into an active and engaging process. The read/write aspect of emerging technologies is especially considered to facilitate students' learning through sharing knowledge and ideas and practicing collaborative writing (Goh & Kale, 2015).

CONCLUSION

Efforts to modernize classrooms and enhance teacher proficiency in utilizing technology face notable hurdles, including issues of acceptance, sustainability, and scalability. Paramount among these challenges is achieving digital equity across students, educators, and administrative bodies. To truly leverage Information and Communication Technologies (ICTs) in enhancing educational outcomes, it is imperative to implement policies and initiatives aimed at ensuring equitable access to digital tools for both students and teachers. The cornerstone of integrating ICT into educational frameworks lies in guaranteeing that both educators and learners have sufficient access to these technologies. This approach not only facilitates a more inclusive academic environment but also underscores the critical role of digital accessibility in the effective application of ICT in education.

RECOMMENDATION

To address the challenges identified in the study regarding the integration of Information and Communication Technologies (ICTs) in education, educational institutions, and policymakers need to collaborate on formulating comprehensive policies

aimed at ensuring equitable access to ICT resources across all educational stakeholders. Investment in the ICT infrastructure is critical, necessitating substantial allocations for upgrading hardware and software and ensuring robust internet connectivity. Professional development programs should be established to enhance teachers' technological competencies, enabling them to integrate ICT tools effectively into pedagogical practices. Furthermore, embedding digital literacy within the curriculum is paramount, preparing students for the complexities of the digital era through an understanding of technology use, critical thinking, and ethical considerations online. The fostering of public-private partnerships can also play a pivotal role, leveraging private sector resources and innovations to enrich the educational landscape. Opting for ICT solutions that offer scalability and sustainability will ensure that educational technologies remain viable and adaptable to evolving teaching and learning needs.

Additionally, the implementation of continuous monitoring and evaluation protocols for ICT initiatives will facilitate the assessment of their impact on educational outcomes and the identification of areas for improvement. Initiatives aimed at promoting digital equity, such as providing devices to underserved students and teachers and ensuring accessible digital content, are crucial for minimizing disparities. These efforts collectively contribute to a more inclusive and technologically empowered educational environment. By embracing these strategies, academic institutions can overcome current obstacles to ICT integration, ultimately enriching the educational experience and fostering a more digitally literate society.

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