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DIGITAL DIVIDE DURING COVID-19 PANDEMIC AMONG UNDERGRADUAT STUDENTS OF PUNJAB, PAKISTAN

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Abstract
This study investigated the context of the digital divide among Undergraduate Students during COVID-19. The purpose of the study was to determine if the digital divide exists as regards access and use of ICT of Undergraduate Students. A questionnaire administrated to 350 stratified sample participants. The participants were asked to describe their profile and available ICT resources and their usage. The authors used quantitative research employing descriptive correlational survey technique and stratified sampling method. The construction of the instrument was based on the Digital Divide Survey. The study's central findings revealed that the digital divide does not exist as predicted by demographic factors such as age, sex, household income (monthly), and living areas. Furthermore, the analysis revealed that there is no significant relationship between those mentioned variables. This means that the digital divide Undergraduate Students regarding their access and use of ICT was found not to exist.
Keywords: Digital Divide Survey; ICT; Undergraduate Students

1. Introduction

The digital divide rears its ugly head during the COVID-19 pandemic. It is defined according to Organization for Economic Cooperation and Development OECD (2020) a term refers to the gap between individuals, households, businesses, and geographic areas at different socioeconomic levels concerning both their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities. In Education and learning, disruptions in the delivery of lessons to students and the shift to online learning due to pandemic have made the digital divide more pronounced.

According to UNESCO (2020), some 826 million students worldwide do not have access to a household computer, while 706 million learners have no internet at home. Learners in the most marginalized groups, who don't have access to digital learning resources or lack the resilience and engagement to learn on their own, are at risk of falling behind. For example, here in the Philippines, nearly 60 percent of households do not have access to the Internet and computer and cannot reap the benefits of digitalization (PDER, 2020).

However, several institutions in the Pakistan still used online learning to keep classes running while the lockdown was implemented (Abad, 2020). Pakistan is one of the institutions which lead online learning to its students and acquire access to ICT to support their Education. But online learning has made inequities, especially around the digital divide, more apparent than ever before (Santos, 2020).

In this study, the researchers sought to determine if the digital divide exists among students of Punjab University regarding their access and use of ICT during the COVID-19 pandemic. The undergraduate students of Punjab University will be the selected participants according to the observation of the researchers to their classmates and schoolmate with the same grade level that usually has internet and ICT problems during classes that might affect their academic performance and make it harder for them to graduate this school year 2020-2021. With the occurrence of the coronavirus pandemic, the landscape of the educational system has changed, and there is a limited amount of published research in this particular situation. Therefore, this study also provides additional evidence to the pool of literature on the digital divide in the framework of pandemic and contributes essential ideas to improve policy on technology use in educational institutions.

The direct beneficiaries of the output of this study are the students who are currently in senior high school to be aware of what the digital divide is. This study will benefit the parents of the students as they are the ones who can personally assist their children in their studies to be aware of. This study will not only provide another piece of information but also it could be a help to the institutions to value the learning of the students and provide them a necessary guide on how they will overcome whatever they are lacking that may inhibit their potential in becoming the best of themselves in the field they are taking in. This study will be beneficial to the teachers as they can adjust their methods of teaching based on the results of this study regarding the digital divide among students during the pandemic.

2. Literature Review

According to (Ritzhaupt, Cheng, Lou & Hohfeld, 2020) Digital Divide has been a topic under investigation since the mid-1990s around the world. The Digital Divide historically has referred to a social inequity between those individuals who have access to information and communication technology (ICT) and those that do not. In recent years, the notion of the Digital Divide has expanded to include other dimensions beyond access, such as the use, and dispositions of ICT resources. The digital divide manifests itself on several dividing factors, such as socioeconomic status, gender, age, culture, geographic location, and more.

The digital divide typically exists between those in cities and those in rural areas; between the educated and the uneducated; between socioeconomic groups; and globally (TeachTarget Contributor, 2020). With the occurrence of the COVID-19 pandemic, many facets of instruction and learning have been affected. The changes in instruction were compounded by a lack of universal access to digital devices and the Internet (Lieberman, 2020), and the ramp-up time to modify instruction for remote learning. In other words, it's brought new light to the digital.

With the occurrence of the COVID-19 pandemic, the advancement of ICT has called for online learning as a feasible and economically appropriate means of extending quality education. The challenge associated with online learning is the access to ICT resources because online learning thrives on the availability of ICT resources (Arthur-Nyarko and Kariuki, 2019,). There is an uneven spread of access to ICT among different populations, households, and spaces because the network is not the same everywhere (Lembani, Gunter, Breines, Tapiwa, & Dalu, 2019). Around 52.4% of the global online population access internet from their mobile devices and more than half of the global population is estimated to go online using mobile devices (Saleh,2020).

Despite of appealing visions and endeavors initiated by public and private entities for the country to take advantage of technology, the status of ICT in the Philippines is still characterized by some identified barriers. (Dotong, et al.,2016), identified barriers in effective utilization of ICT in the country, these are inadequate financial support and infrastructure, human capital, management support, as well as behavioral and environmental aspects. The geographical location is another factor to consider.

Differences in internet access exist among students with different demographics. For example, National Center for Education Statistics (NCES) data shows that the more educated parents have and the higher the household income, the likelier students are to have internet access at home (2018).

According to Santos (2020), in the Philippines, a DepEd survey showing that, of the 6.5 million students who have access to the Internet, approximately 20 percent use computer shops or other public places to go online. Worse, 2.8 million students have no way of going online at all. This is especially common in the rural areas where 53 percent of the population live and where both internet access and speed can be a challenge. The southern Philippine province of Siargao, for example, lies within the areas that have the slowest internet connection. Provincial government data indicates that less than 30 percent of the student population have internet access and there are some 600 students in “off-the-grid schools.

With classes shifting to flexible learning, the time that students spent online have dramatically increase. According to Datareportal (2021), In the third quarter of 2020, the average daily time spent using the Internet among the surveyed students in the Philippines was approximately 10.6 hours. In addition, in terms of internet expenditure, an estimated 4.7 million Philippine households have members in online learning programs, according to the Social Weather Station (SWS) report. Nearly 9 out of 10 families spend an average of

901 pesos a month on internet services, with 56% using pre-paid connections, the survey showed (Cecilia, 2020).

Many countries admit that they will face many struggles in implementing distance learning, and the most apparent among these issues will be access to ICT. In the Philippines, the availability of resources will have a significant impact on the students' distance learning journey and will widen the education gap. Some students from low-income households or remote areas do not have internet access and gadgets; and as Albay Rep. Joey Salceda shared, only 17% of Filipino students have internet access at home and only 3.74% have mobile phones (Daguno-Bersamina & Relativo, 2020).

The living areas of a student's home can also play an essential role in home-based Internet service. Students living in households in rural areas typically have more limited access to the Internet than students living in the urban (NCES, 2018b). In the Philippines, connectivity remains higher in urban centers and weak digital infrastructures persist in more rural areas. According to DICT (2020), a higher incidence of urban households has Internet compared to rural households, with Metro Manila households having the highest access at 32.3%.

In terms of sex, the digital divide also exists. According to the Plan International report (2020), females often have less access to technology and the Internet compared to males. Particularly in developing countries, females struggle to afford technology and internet access. In addition, stereotypes around technology being 'for boys' and fear of being discriminated against stop girls from using digital tools. The sex digital divide in access to the Internet remains largest in the world's least developed countries at 32.9%. The internet gap is largest in the Philippines, while in terms of mobile phone ownership, the sex digital divide is most pronounced in South Asia where females are 26% less likely to own a mobile phone than males.

Age is an important factor influencing the ever-widening digital divide. Based on 2013 Pew research data, older Filipinos (65+) are much less likely to use the Internet compared to younger people (Zickuhr, 2013). Fortunately, the age gap in the digital divide appears to be narrowing; for the first time, 53% of older Filipinos use the Internet and email. Additionally, 70% own a cellphone, this is compared to only 57% two years ago.

3. Method

The study used a descriptive method to determine the existence of the digital divide during pandemic among undergraduate students. It is also relational in terms of analyzing the relationship between the respondents' profile variables and the use of ICT. For this reason, descriptive correlational method and survey research models were used together.

Sample

This study will be administered to a total of two hundred 350 undergraduate students University of Punjab. The participants come from Social and Management Departments.

Data Analysis

Spearman Rho correlation was the basis for data analysis. The data obtained from Digital Divide Survey were transferred to a computer and were analyzed with the SPSS.

Results

The majority of the participants are 18 years old, followed by the age of 19 years old, and 17 years old To briefly explain, most of the participants that were surveyed are in their adolescent years.

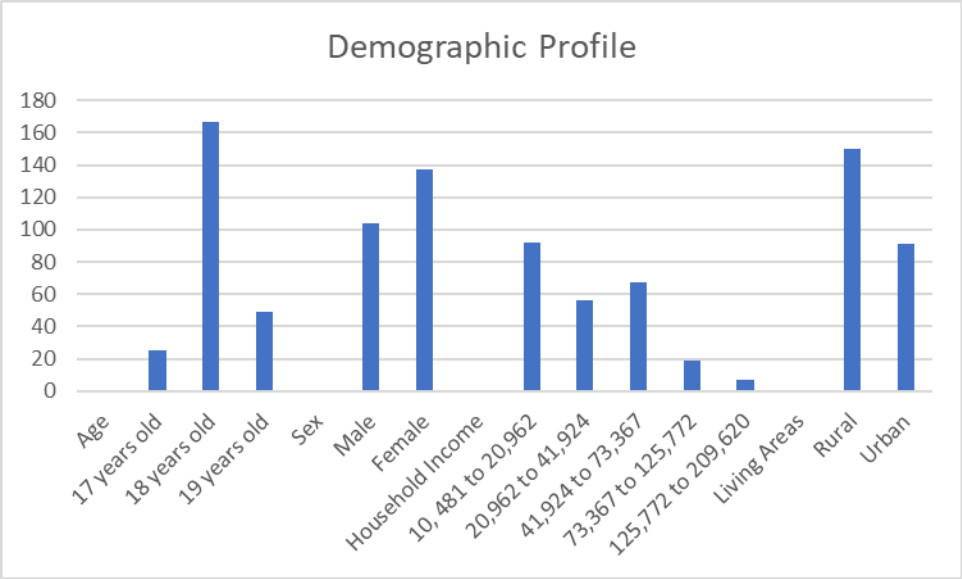

Table 1 shows the personal ICT device of the participants. iPad/Tablet tops the list when it comes to new normal Education as 93 students (38.59%) use it as the main device for learning. While the other 72 participants (29.88%) used a cellphone. It summarized that all the participants had personal ICT devices and the mobile devices including iPad/Tablet and cellphone are mostly used for online learnings. Around 52.4% of the global online population access internet from their mobile devices and more than half of the global population is estimated to go online using mobile devices (Saleh, 2020).

Internet Access. Table 2 shows the Internet access of the participants. 155 participants used wired/Wi-fi connection to attend their virtual classes. While the other 70 participants used mobile data. However, there are still 3 participants who have no internet and 2 students (0.83) used pisonet/rental it means they don't have internet access at home putting them at disadvantage. To briefly explain, most of the participants have access to the Internet, while there are only a few has not. According to Santos (2020), a DepEd survey showing that of the 6.5 million students who have access to the Internet and worse, 2.8 million students have no way of going online at all.

Weekly internet expenditure (load). Table 2 shows the weekly internet expenditure of the participants. Most of the participants (100 or 41.49%) spent less than Php 100 weekly for their internet expenditure. While the least 22 participants (12.03%) spent Php 210-250. According to the Social Weather Station or SWS report (2021), nearly 9 out of 10 families spend an average of 901 pesos a month on internet services, with 56% using pre-paid

connections. It means, that most of the participants are not included in the 9 families that spending much of money on the Internet.

Daily time spent online for academic purposes. Table 2 shows the daily time spent online for academic purposes of the participants. Most of the participants (97 or 40.25%) spent 5-10 hours online. According to Datareportal (2021), the average daily time spent using the Internet among the surveyed respondents was approximately 10.6 hours. while others spend only 1-5 hours (71 students or 29.46%). It summarized, with classes shifting to flexible learning, the time that participants spent online to accomplish their school requirements has dramatically increased.

Table 1. Descriptive statistics for ICT resources and usage

Factors	F
Personal ICT Devices	
Laptop Computer	53
Desktop Computer	23
Cellphone	72
iPad/ Tablet	93
Internet Access	
Broadband Connectivity	11
Mobile Data	70
Wired/ Wi-Fi Connection	155
Pisonet/ rental	2
No internet	3
Weekly Internet Expenditure	
Less than 100	100
160 – 200	39
210 – 250	29
More than 250	73
Daily Time Spent	
1 to 5 hours	71
5 to 10 hours	97
11 to 15 hours	51
16 to 20 hours	13
More than 20 hours	9

The significant relationship between profile variables and available ICT resources and usage is the determinant if the digital divide exists among grade 12 students. The findings

from this study showed that age and household income (monthly) found a significant relationship only in terms of daily spent online for academic purposes. While in terms of personal ICT device, internet access, and weekly internet expenditure (load) which are the highly determinant of the digital divide were not found. Generally, this means that the digital divide does not exist as regards access and use of ICT among undergraduate students of Punjab University.

Table 2. Significant relationship on the available ICT resources and usage

Profile	Factors	$r_{(x,y)}$	p-value
Age	Personal ICT Devices	0.07	0.2816
	Internet Access	-0.06	0.3942
	Weekly Internet Expenditure	0.07	0.2907
	Daily Time Spent for Academic Purposes	0.17	**0.0083
Sex	Personal ICT Devices	-0.05	0.4647
	Broadband Connectivity	0.06	0.3364
	Weekly Internet Expenditure	0.08	0.2122
	Daily Time Spent for academic purposes	-0.01	0.9232
Household Income	Personal ICT Devices	0.02	0.7222
	Internet Access	0.02	0.7267
	Weekly Internet Expenditure	-0.11	0.0882
	Daily Time Spent for academic purposes	0.29	**3.78E-06
Geographic location	Personal ICT Devices	0.05	0.4510
	Internet Access	0.08	0.2370
	Weekly Internet Expenditure	0.02	0.7048
	Daily Time Spent for academic purposes	0.10	0.1337

CONCLUSION

Based on the findings significant relationships were found to exist only in daily spent on online activities. And it's not found in personal ICT devices, internet access, and weekly internet expenditure (load) which are the highly determinants of the digital divide. Therefore, generally, the existence of the digital divide as predicted by demographic factors such as age, sex, household income, and living areas has not been confirmed. This means that whatever how old they are, where they live, what their socioeconomic status, and even though about sex is female or male still they have access and use of ICT.

But the fact that there are still 2 students who used pisonet/rental and 3 students who still don't have internet connections poses critical implications and necessitates deliberate policy formulation. It is also good to note that while mobile learning is progressing, there are students whose gadgets remain to be low-tech making it hard for them to access instructional materials uploaded online.

Since the study has not confirmed the existence of the digital divide among Grade 12 Senior High School Students, it suggests if a model could be developed in detecting the existence of digital divide in a larger community like in all Senior High School Students or the whole school. However, the Digital divide is still a negative context to Education, future researchers may focus on the impact of the digital divide on the academic performance of the students. Also, the research could be conducted regarding how students use the Internet and ICT at home. And lastly, researchers, educators, school administrators, parents, and students must continue to play a role in initiating improvements with continued demands for equitable access.

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