Faculty's Access to Information and Communication Technologies in Colleges and Universities in Central Visayas, Philippines

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***Abstract*—Information and communications technology (ICT) is a useful tool in the modern world, becoming indispensable, particularly in the educational setting. With this, the researchers looked into the ICT access of the faculty in colleges and universities in Central Visayas, Philippines. This access was measured through Faculty's ICT Access (FICTA), administered through online surveys. Study findings revealed that faculty had physical access to ICT, evidenced by their acquisition of laptop computers, smartphones, Internet connections, and office suite software. Moreover, teachers were highly motivated to use ICT and highly skilled to operate, search, and strategize online. They also had high usage of ICT in their general and instructional work. Furthermore, motivation, skills, and usage access were significantly associated with one another. In conclusion, teachers have access to ICT which made their teaching better. Better digital infrastructure, more capability training, and encouraged utilization of ICT are recommended at the higher educational level in the country.**

***Index Terms*—Faculty access, information and communications technology, motivation, physical access, skills, usage**

I. Introduction

Decades ago, technology access, usage, and integration by faculty have been pushed and encouraged among primary, and secondary schools, and universities. There had been political and public support for technology usage among universities. Computers, and smartphones, among others, were already oversold by policy implementers and advocates of technology usage in the field of education but were not efficiently and effectively utilized in instruction. As educational technologies gained popularity, the traditional face-to-face teaching, and learning flow slowly shits to online learning to address the current situation where the pandemic hampers the usual educational flow [1, 2].

Helpful technology-related instruction was intensified and embraced by teachers, the facilitators of learning, as innovations are required to adapt to the dynamic nature of education [3]. Conducting technology-related instruction such as online classes can be done through free platforms like zoom, FB messenger, google classroom, and google meet [4]. The trending landscape of education that most students and teachers in the new normal used included microlearning, gamification, blended learning, personalized learning, and e-portfolios [5, 6]. The influence of new technologies and intensified internet speed led the various online education modes to grow worldwide and become mainstream by 2025 [7]. Some technologies that faculty members in higher education institutions used are the internet, course management system, presentation software, slide presentation, spreadsheets, and word processing [8]. Added to the technologies that enhanced learning among students were the social media sites like YouTube, Twitter, and Facebook.

With the use of technology in the classroom, teachers' tasks such as preparing visual aids, carrying heavy learning materials, teaching using chalk pens, and grading the students manually have become light and easy. Teachers became aware of the gains and benefits of technology such as smartphones, tablets computers, and software in their work and daily life [9]. They were found to be confident in learning new applications and software while being guided on how to use them [10]. As teachers accessed technology such as their computers, smartphones, and software (e.g. Webquest) and integrated them into the learning process, they enhanced their technological and manipulative skills [11, 12].

In the context of learning institutions, outside the Philippines, teachers utilized varied educational applications to improve the lecture's effectiveness. They also intended to raise their productivity, test their pedagogical practice, capture useful photos for their classes, and record voices, and videos [9]. In 2020, a survey at Colorado Mountain College, USA, responded by 104 faculty members revealed that teachers accessed technology for three main reasons. 87% of the respondents visited websites to view YouTube videos, Kahoot, and their virtual classrooms. Second, they accessed their computers to make instructional videos. Third, 61% of them enjoyed accessing their devices to create slide presentations. The survey also indicated that teachers also created their instructional videos, websites, podcasts, wiki pages, SoftChalk lessons, google communities, blogs, Facebook groups, LinkedIn groups, Instagram, virtual reality environments, and VoiceThread [13].

However, the results presented in the preceding paragraphs were combined realities of online learning before the pandemic and those that were conducted at the onset of the crisis. Several research studies claimed the many struggles experienced when accessing and using technologies to improve their teaching practice. Herbert *et al.*

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[9] found out that teachers only had the confidence to manipulate during guided practice, but could not navigate the technologies on their own. Sometimes, teachers were left with no choice but to embrace the nature and ways of online education despite the reality that most teachers were digital immigrants since they were before the 1980s [9]. In consonance, Chua *et al.* [4] found out that most teachers lack training in using the learning platforms and lack understanding of their online learners [14]. The teachers were digital immigrants who could not fully operate the online platforms that their students use. Coman *et al*. [15] and Hermoso *et al.* [16] also revealed that there was a need to train teachers on the use of learning management systems and online learning tools to help them cope with the educational landscape's sudden shift. It could be done through a program that improved the teachers' technical skills and effectively communicated with their students.

The present educational status is still stunned by the limitations dictated by the pandemic. There is still a gap to be explored regarding the access of teachers and faculty members to technologies, and knowing the details of it will improve the training and implementation that school administrators and policymakers may give to their teachers [17]. In addition, the revelation of what the teachers accessed and used can also be a benchmark point for neophyte technology users and a mastery basis for technology-savvy educators. Looking at the present scenario of the school in the Philippines, some learning institutions are still experimenting while some are groping from the little that they know and the little that they have learned from supportive peers. Therefore, getting the voice of the 460 respondents from state colleges and universities in Central Visayas can mean ample information to base on.

II. Statement of the Problem

This study examined the access of the tertiary faculty to information and communications technologies (ICT) as learning technologies across different colleges and universities in Central Visayas, Philippines. Specifically, it aimed to assess the teachers' ICT access in terms of physical, motivational, skill, and user access and determine whether significant correlations exist among the said forms of access.

III. Methodology

The researchers utilized a descriptive-correlational study to examine the access to ICT of teachers across different colleges and universities in Central Visayas, Philippines. Through random sampling of participants in a state-funded training on flexible training last September 2021, a total of 460 teachers from 20 tertiary schools in the said region participated in the study.

A standardized tool, Faculty's ICT Access (FICTA) questionnaire developed and validated by Soomro *et al*. [18], was used in the study with permission. This tool consists of 57 items divided into eight constructs. Internal consistency of the overall FICTA scale was at Cronbach's alpha value of 0.868 while the individual constructs had values ranging from 0.680 to 0.885, signifying that the tool has acceptable reliability.

Before the tool was administered to the respondents, research permissions were obtained. The researchers sought approval from the heads of the colleges and universities in the region and asked for informed consent from the teachers for their voluntary participation in the study. Once approved and permitted, the research tool was sent to the teachers via Google Forms. Data were retrieved by downloading the excel file derived from Google Forms. All gathered data were kept confidential and respondents' names were anonymous at all times.

The data were analyzed using descriptive and correlational analyses conducted in the Statistical Package for Social Sciences (SPSS) version 23. The level of access to ICT across the eight constructs was described using frequency and percentages (for physical access) and means and standard deviations (for motivational, skill, and user access). The following are the descriptions of the means and access levels based on the tool interpretation by Soomro *et al.* [18] and Malkawi *et al*. [19] (Table I):

TABLE I: Interpretation of the Means

Mean Range	Description	Interpretation
Individual Statements		
1.00-1.80	Strongly Disagree	Strongly disagree with the statement about the access
1.81-2.60	Disagree	Disagree with the statement about the access
2.61-3.40	Neutral	Neither agree nor disagree with the statement about access
3.41-4.20	Agree	Agree with the statement about the access
4.21-5.00	Strongly Agree	Strongly agree with the statement about the access
Overall Access Levels		
1.00-2.33	Weak	Low capability level to access ICT
2.34-3.66	Moderate	Moderate capability level to access ICT
3.67-5.00	Strong	High capability level to access ICT

Lastly, the different levels of ICT access were correlated with one another through Spearman rank correlation, conducted at 95% confidence levels. All p-values less than .05 are considered significant.

IV. Results and Discussions

A. Physical Access

Physical access is also called material access because it refers to the ownership and authorization to use digital technologies [18, 20]. The access to different digital technologies by teachers is presented in Table II.

Based on Table II, teachers have access to ICT tools at home and school since the 2020 when the pandemic began. The majority of them have laptop computers, smartphones, LMS, Office software, flash drive, Internet access, and printers. On the other hand, some of them own desktop computers, iPads/tablets, and webcams, while others have available software such as photo editing, video editing, and

statistics. Nevertheless, these tools are essential components for teachers in the digital age as they can use them in their general teaching functions as well as specific instructional roles with convenience and portability [21].

TABLE II: PHYSICAL ACCESS TO ICT BY TEACHERS AT HOME AND SCHOOL

Technology	Accessible at Home	Accessible at School
Laptop computer	454 (98.7)	328 (71.2)
Smartphone with Internet function	394 (85.6)	334 (72.5)
Learning management system	373 (81.0)	304 (66.0)
Office software suite	346 (75.2)	304 (66.0)
USB flash drive	340 (73.9)	282 (61.4)
Broadband/ DSL internet	276 (60.1)	325 (70.6)
Printer	262 (56.9)	286 (62.1)
Webcam	184 (39.9)	147 (32.0)
Photo editing software	141 (30.7)	135 (29.4)
Desktop computer	132 (28.8)	276 (60.1)
Video editing software	123 (26.8)	114 (24.8)
iPad/Tablet	108 (23.5)	75 (16.3)
Statistical software	48 (10.5)	54 (11.8)

The results for physical access imply that teachers in Central Visayas, Philippines have the essential ICT tools for the teaching-learning process. Acquiring these tools and buying access to the digital world is essential in helping them develop their digital information and technology literacy [18], [20, 22]. Digital infrastructure is identified as a crucial factor in teachers' use of technology in their classes [23, 24]. With this access, they may become more digitally literate educators for the increasing population of digital native learners in the Philippines.

B. Motivational Access

Motivational access is the readiness of teachers to acquire, own, and use ICT tools in their teaching and learning process [18, 20]. This dimension can be endogenous or exogenous motivation (Table III).

Table III shows that teachers had strong endogenous motivation (μ=4.66, SD=0.46) to use ICT because they have the desire to adopt it in their teaching. This is evident in their strong agreement with the use of computers and the Internet to improve and enjoy their work and provide information for better decision-making, and their disagreement with the non-beneficial use of ICT. Self-motivation is seen to mediate teachers' readiness to adopt ICT in their classes [25]. In the same manner, teachers also had strong exogenous motivation (μ=4.14, SD=0.72) to use ICT when they can see their immediate environment also using it. They strongly agree that they see their digitally literate colleagues as motivators for technology use, and agree that their respective schools, students, and superiors expect them to use it. Environmental influences like the school's capacity building can also mediate the readiness to use ICT [26].

The strong levels of motivation to use ICT shows the eagerness of the teachers to use it in the teaching and learning process. Their self-motivation may be due to their self-efficacy to use ICT as they are exposed to these tools and most of them have adapted to the technology-enriched classes that they have. Aside from this, the schools have supported their endeavor for ICT integration in the form of training and seminars as well as the inculcation of the educational values of ICT. Read literature associates these motivators with self-efficacy, educational values, impacts on teaching, and training attended [24] as well as classic constructs of perceived enjoyment and perceived usefulness of ICT as intrinsic and extrinsic factors [27].

TABLE III: MOTIVATIONAL ACCESS TO ICT BY TEACHERS

Motivation	Mean (SD)	Description
Endogenous Motivation		
Using computers and Internet can improve my work performance.	4.90 (0.34)	Strongly Agree
Using the computer and the Internet seems to be enjoyable.	4.78 (0.46)	Strongly Agree
Using the Internet can provide me with information that would lead to better decisions.	4.76 (0.45)	Strongly Agree
Using ICT will be of no benefit to me.	1.82 (1.39)	Disagree
Overall Endogenous Motivation	**4.66 (0.46)**	**Strong**
Exogenous Motivation		
Seeing other teachers using the computer and the Internet inspires me.	4.69 (0.58)	Strongly Agree
I am interested to adopt digital technologies because my university provides enough technical support.	4.03 (1.11)	Agree
I wish to use the computer and the Internet because my students think that I should use them.	3.99 (1.26)	Agree
I want to use ICT because my superiors expect me to use it.	3.85 (1.15)	Agree
Overall Exogenous Motivation	**4.14 (0.72)**	**Strong**

C. Skills Access

The teachers' ability to learn, use, and eventually manage ICT tools constitutes the skills access, which could be described in three successive levels of operational, informational, and strategic skills [18, 20, 28]. The level of these skills is shown in Table IV.

As shown in Table IV, the teachers claimed to have strong operational skills access (μ=4.49, SD=0.45) in terms of operating ICT tools. The operational skills are seen in their strong agreement that they can send an attachment with an email, transfer files from sources, create and edit a file in a word processor, save images and text from the web, create presentations, and download programs from the Internet, and disagreement that they have difficulty in changing some basic computer settings. Fundamental skills to operate digital devices and the Internet are needed to function well in the teaching workplace and learning environment [29, 30]. Moreover, teachers had strong informational skills access (μ=4.36, SD=0.60) as observed in their strongly agreed response on searching the Internet, choosing results from it, advancing search options, synthesizing online information, evaluating sources, and retrieving a site on the web. Informational skills are essential skills teachers should possess to be able to appropriately search for information, critically evaluate these data, and properly use the facts for instructional purposes [31–33]. Furthermore, teachers had strong strategic skills access (μ=4.55, SD=0.48). This finding shows that teachers are confident in making decisions and choosing options online, working towards a specific goal and reaching it easily, achieving their goals, and optimizing these benefits. Taking advantage of ICT for making the right

orientation, action, and decision towards a goal amplify teachers' skills to strategize in the modern world [28].

The foregoing findings imply that teachers may have adjusted to the use of ICT in teaching and learning. They acquired the skills to be able to operate, search, and strategize using the computer and Internet for the advantage of their classes, especially during the new normal.

TABLE IV: SKILLS ACCESS TO ICT BY TEACHERS

Skills	Mean (SD)	Description
Operational Skills		
I can send an attachment with an email.	4.82 (0.43)	Strongly Agree
I know enough about transferring files from a hard disk to a USB flash drive and vice versa.	4.81 (0.45)	Strongly Agree
I feel comfortable creating and editing a text file in a word processing program.	4.67 (0.55)	Strongly Agree
I can save images and text from the website on a hard disk.	4.61 (0.70)	Strongly Agree
It is easy for me to create a computer presentation.	4.56 (0.63)	Strongly Agree
I feel confident downloading programs from the Internet.	4.35 (0.74)	Strongly Agree
I feel difficulty changing some basic computer settings (wallpaper, time/date, sounds, etc.).	2.40 (1.49)	Disagree
Overall Operational Skills	**4.49 (0.45)**	**Strong**
Informational Skills		
I always know what search terms to use when searching the Internet.	4.51 (0.60)	Strongly Agree
I can easily choose from search results.	4.45 (0.65)	Strongly Agree
I can use advanced search options to reach my required information.	4.39 (0.67)	Strongly Agree
I feel comfortable synthesizing online information.	4.31 (0.74)	Strongly Agree
I feel confident to evaluate the sources of the information found on the Internet.	4.30 (0.73)	Strongly Agree
It is easy for me to retrieve a website on the Internet.	4.22 (0.85)	Strongly Agree
Overall Informational Skills	**4.36 (0.60)**	**Strong**
Strategic Skills		
I feel confident in making important decisions with the help of the Internet.	4.54 (0.65)	Strongly Agree
I can choose by consulting the Internet.	4.36 (0.73)	Strongly Agree
On the Internet, it is easy for me to work toward a specific goal.	4.55 (0.58)	Strongly Agree
I can reach my intended goal while using the Internet.	4.49 (0.56)	Strongly Agree
Using various ICT tools, I feel confident in achieving my goals.	4.64 (0.54)	Strongly Agree
I can gain benefits from using the computer and the Internet.	4.71 (0.52)	Strongly Agree
Overall Strategic Skills	**4.55 (0.48)**	**Strong**

With this, they gained access to how ICT can be used in education and accomplished their work because of this access. Skill access is critical to the work of teachers as teaching and learning need to be relevant and factual yet practical in the light of virtual education [34, 35].

D. Usage Access

The actual use of ICT by teachers is termed usage access, divided into general and instructional usage [18, 20, 36]. The extent to which teachers use ICT is presented in Table V.

Based on Table V, teachers responded that they had strong general usage access (μ=4.61, SD=0.40) of ICT in their general work at the tertiary level. They use ICT in research, communication, presentations, and even entertainment. This means that they took advantage of what computers and Internet can provide them to make work easy and enjoyable [37, 38]. Aside from this, teachers were able to have strong instructional usage access (μ=4.65, SD=0.45) for instructional purposes.

TABLE V: USAGE ACCESS TO ICT BY TEACHERS

Use	Mean (SD)	Description
General Usage		
I search for the information of my interest on the Internet.	4.67 (0.55)	Strongly Agree
I use ICT to support my research activities.	4.73 (0.50)	Strongly Agree
I use email as a primary means of communication.	4.43 (0.73)	Strongly Agree
I make voice/video calls via the Internet.	4.51 (0.72)	Strongly Agree
I create letters, reports, and/or papers on the computer.	4.77 (0.46)	Strongly Agree
I prepare presentations on the computer.	4.78 (0.46)	Strongly Agree
I store and manipulate data in a spreadsheet program.	4.41 (0.69)	Strongly Agree
I use digital technologies to watch movies or television programs.	4.61 (0.56)	Strongly Agree
Overall General Usage	**4.61 (0.40)**	**Strong**
Instructional Usage		
I use ICT for communication about assignments among students.	4.72 (0.50)	Strongly Agree
I use ICT for enhancing students' content learning.	4.67 (0.55)	Strongly Agree
I use ICT for facilitating students' group work.	4.63 (0.56)	Strongly Agree
I use ICT to improve students' problem-solving skills.	4.56 (0.56)	Strongly Agree
I use digital technologies for the delivery of my instruction.	4.71 (0.51)	Strongly Agree
I use digital technologies to communicate with students.	4.76 (0.48)	Strongly Agree
I prepare learning materials using computer and Internet resources.	4.75 (0.49)	Strongly Agree
I develop critical thinking skills among students with the help of ICT.	4.57 (0.56)	Strongly Agree
I use ICT to encourage peer feedback among my students.	4.58 (0.58)	Strongly Agree
Overall Instructional Usage	**4.65 (0.45)**	**Strong**

Teachers have utilized ICT for student communication, learning enhancement, skill improvement, instructional delivery, and peer feedback. This indicates that ICT has been part of the teaching-learning process these teachers for their instruction to be enhanced and more interactive [39, 40].

The high extent of ICT usage by teachers signifies that they utilized computers and the Internet in their teaching job. This suggests that they were immersed with ICT as a tool for instruction, wherein better communication, meaningful activities, and interactive engagements occur during classes. In this way, teachers can offer learning that develops not only their skills but also their dealing with their peers [39, 40].

E. Association between Motivation, Skills, and Usage Access

The motivational, skill and usage access dimensions were subjected to correlational analysis at a 95% confidence level. The results of this analysis are highlighted in Table VI.

As reflected in Table VI, all but EX and OS had a

significant relationship. Motivation due to environmental factors was observed to have no significant association with operational skills, negating read literature [25]. Though varied extents, the significant relationships indicate that motivational access can inform skill access, skill access can be associated with usage access, and vice-versa. These associations are common findings as found in recent read literature [41–44].

TABLE VI: CORRELATIONAL ANALYSIS BETWEEN MOTIVATIONAL, SKILL, AND USAGE ACCESS

Variables	r_s-value	p-value	Interpretation*
EX and OS	0.088	.058	Not Significant
END and IS	0.247	.000	Weak
EX and IS	0.284	.000	Weak
END and SS	0.289	.000	Weak
EX and SS	0.351	.000	Moderate
END and OS	0.447	.000	Strong
OS and IU	0.494	.000	Strong
OS and GU	0.518	.000	Strong
IS and IU	0.646	.000	Strong
IS and GU	0.681	.000	Strong
SS and GU	0.681	.000	Strong
SS and IU	0.726	.000	Very Strong
GU and IU	0.775	.000	Very Strong

Note: END=endogenous motivation; EX=exogenous motivation; OS=operational skills; IS=informational skills; SS=strategic skills; GU=general usage; IU=instructional usage

*Not significant (p>0.05), Significant (p<0.05); If significant: 0.01-0.19 (Negligible), 0.20-0.29 (Weak), 0.30-0.39 (Moderate), 0.40-0.69 (Strong), 0.70 and above (Very strong) [39]

V. CONCLUSION AND RECOMMENDATIONS

Information and communications technology (ICT) has been a tool for teaching and learning in the modern world. Higher education teachers showed that they have access to ICT for their classes, including physical access to computers, the Internet, and other devices. They also have higher endogenous and exogenous motivation, high operational, informational, and strategic skill extents, and high general and instructional usage of ICT. These aspects showed significant relationships with one another, signifying that motivation could affect skills and usage. Hence, access to ICT could be improved through better digital infrastructure, capability training, and encouraged utilization of ICT in the higher education landscape in the country.

The study is limited to the faculty members of Central Visayas, Philippines; hence, a similar study of other faculty members from other regions and countries may be conducted. Qualitative inquiry is recommended to grasp the overall picture of how Filipino faculty in higher education employ ICT in their online and hybrid classes.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

G. Sumalinog and J. Mananay done works on Introduction, Abstract, and References. C. Goles and I. M. Alejandro gathered data for the paper. J. M. Sanchez done works on Interpretation of Data and Conclusion. M. Baguia done works on Proofreading and Editing. All authors approved the final revision of the paper.

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