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Snapshots from Phnom Penh: Technology Use by University Students

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The article describes a snapshot of university students' technology and prospective professionals in the Cambodian capital of Phnom Penh. Data collected came from a private university and a public university prominent in Cambodia. The participants completed an online Qualtrics survey on their use of technology for academic, social, and personal purposes. Also, they identified the type of devices used to meet their objectives. The results were discussed with the research literature on teaching and learning with technology contexts in other Asian countries, behind which Cambodia seems to lag in similar integration efforts. The study provides documentation of using technologies in education in a sample urban population prepared for employment and a baseline for reflections on university and student practices on technology usage.

Keywords: Cambodia, Technology integration, Technology utilization, University students

Introduction

During a visit to Phnom Penh, the researchers met with groups from local universities. Faculty members, administrators, and university students from a private university attended a professional development workshop facilitated by one of the researchers. The public university students participated in a lecture demonstration. Participants completed an online survey on their perceived use of technology. The data collected provided documentation of technology use from the sample population and the results of the data analysis provided an opportunity for reflections on practices. The researchers aptly labeled the strategy of collecting information about a population, event, or phenomena, analyzing the data, and preparing a dissemination report as "snapshot" research. Beyond the commonly known definition of the snapshot, i.e., an impression or view of something brief or transitory (Merriam-Webster, n.d.), the researchers argue that accumulating data across location, population, or time provides a bigger picture towards the understanding of the phenomenon.

Education and Technology in Asia

The importance of education among the Asian population is significant. Home to more than 700 million people, where 25.7% are eligible for schooling (Abigail, 2021; Lia, 2021), the number of resources needed to support the successful transition in the educational ladder is massive. In the last decade, information and communications technologies (ICT) have played significant roles in providing educational opportunities to Asian learners. Educational technologies as teaching and learning tools take various forms. Examples from the literature include mobile devices and applications, digital content, websites containing quizzes, videos, and tutorials to provide Southeast Asian students with educational opportunities despite circumstances and locations (Lia, 2021).

Benefits of Using Technology

The research literature discusses and describes the benefits of using technology to support learning, such as creating a more engaging environment (Cox, 2019). Also, technology use can encourage active participation and accommodate different knowledge and skills strategies (Kostley, 2014; Purcell et al., 2013). Finally, technology can facilitate collaboration and peer-to-peer connections and interactions at different levels (social, emotional, etc.) (Deshpande, 2019).

Challenges of Integrating Technology

However, using technology to support learning brings challenges, especially in Asian contexts. Abigail (2021) described

the challenges involving limited or no access to compatible mobile devices, intermittent, unstable or no internet connection, lack of teacher and system preparedness, poor implementation or delivery, and confusing roles for various stakeholders (i.e., government, educators, administrators, and resources providers). In addition, Nagel (2014) added to the list of challenges by identifying resistance to change, competition from new ways of teaching (MOOCs) and availability of informal learning strategies (Flipped classroom), and failures to implement effective personalized learning and use technology for formative assessments.

Data Collection

Participants and Recruitment

The lead researcher partnered with a faculty member working at a Cambodian university as a co-researcher. In recruiting participants for data collection, the lead researcher visited two local universities in Phnom Pehn arranged by the Cambodian co-researcher. Initially, the university students who attended the workshops conducted by the lead researcher received printed surveys and completed them before leaving the venue.

The Survey

Based on the analysis of the related literature and other secondary data sources (Andrade, 2012; McLaren, 2019; UNESCO, 2013), the lead researcher created a survey with items including questions on demographic information, perceived frequency of using technology, and technology devices used in completing tasks. The introductory narrative explaining its purpose and goals included consent to participate in the study.

After the study participants provided consent, they accessed survey items (print or online) of thirty-two statements referring to various tasks (see Figure 1) and several questions collecting demographic information. Participants first completed a sentence that read, "I use technology to...," followed by a statement about a specific task (e.g., listen to music). In completing the information, the participant needed to choose one of the answer options: None at all, Sometimes, Most Times, and All the time. Second, the participants responded to the next question asking for the technology device to complete the previous statement's task. The choices included a SMART phone, tablet/iPad, laptop, or desktop computer. The survey question did not ask if they owned the technology devices. Also, participants could choose Not Applicable if they had no experience completing the task, as mentioned earlier, or did not use a technology device.

1. Access online databases and research articles.
2. Build web pages and websites.
3. Buy or sell items online.
4. Call friends and family.
5. Chat with family and friends.
6. Check or monitor my finances or bank account.
7. Complete an online form.
8. Compute or solve math-related problems.
9. Create a digital story.
10. Create an online profile (e.g., Facebook).
11. Create a podcast.
12. Create digital images (e.g., using Photoshop).
13. Create multimedia files (e.g., videos or movies).
14. Design and create brochures, flyers, or posters.
15. Enter data into a spreadsheet
16. Listen to music.
17. Look up words using online reference tools.
18. Make a reservation for a place to stay (e.g., hotel).
19. Pay bills online.
20. Search for information on the web.
21. Play an online game.
22. Put together an electronic presentation (e.g., using PowerPoint).
23. Send and receive email from friends and family.
24. Store digital images.

25. Submit an application for school or job.
26. Take or complete an online course.
27. Take pictures or digital images.
28. Text friends and family.
29. Translate texts from one language to another.
30. View images of places for a vacation.
31. Watch videos online (e.g., YouTube).
32. Word process papers and assignments.

Figure 1. Survey items of tasks completed using technology devices.

The researchers conducted a second round of data collection by sending out an online survey using students' emails provided by faculty members supportive of the research project. The researchers delivered the online survey through the *Qualtrics* application. The lead researcher received all completed surveys (print or online) and entered the data in a spreadsheet for analysis.

Data Analysis

Descriptive statistical techniques using the SPSS software facilitated data analysis. Researchers utilized frequencies to describe the perceived user type of participants by gender, age, extended use of technology, and the kind of technology they used to complete specific tasks:

- **Perceived User Type**: Beginner, Average, Above Average, Heavy
- **Gender**: Female, Male
- **Age** (years old): 19-24, 25-29, 30-34, 35-39
- **Perceived Frequency of Technology Use** (in a given day): None at All, Sometimes, Most Times, All the Time
- **Type of Technology Device Used**: Desktop, Laptop, Tablet/iPad, SMART Phone

Limitations

The study was exploratory and descriptive in using a survey approach to provide a snapshot that characterizes a sample of a target population, i.e., university students attending two Cambodian universities in Phnom Penh. The data might not represent the student population of higher education institutions in Cambodia.

Results and Discussion

The survey responses as self-reports on the completion of specific tasks using technology (or not) provided opportunities for reflection on technology practices in an urban setting (Phnom Penh) in a southeast Asian country (Cambodia). The researcher focused on three areas of inquiry:

1. Type of technology users given gender and age from self-reports.
2. Technology devices students use in completing specific tasks.
3. Perceptions of the use of technology in completing particular tasks.

Participants' Characteristics

Researchers selected demographic information (gender, age) to describe the survey respondents. Researchers received more than 150 completed survey forms but considered 132 with valid responses for analysis. The sample came from the completed surveys of 58 females (43.93%) and 74 male (56.06%) participants. Based on valid survey responses, the age distribution ranged from 75 surveys for 19-24 year old (56.81%), 36 for 25-29 (27.27%), 12 for 30-34 (9.09%), and 9 for 34-39 (6.81%).

Perceived User Type

The survey asked participants about the frequency of technology use in completing specific tasks identified. Also, the

researchers asked the participants how they see themselves as users of technology, given the amount of time spent. Based on the participants' response to their perceived amount of time spent using technology devices, tools, or applications in a day, the researchers categorized them as Beginner (10% or less per day), Average (more than 10% but less than 50%), Above Average (50% but less than 90%), and Heavy (more than 90% to a 100%). One of the participants identified as Beginners, and 16.6% identified themselves as Heavy users. Above Average users were more than half of the sample population (64.3%) and led the frequency count groups followed only by twenty-four Average users (18.1%).

Gender and User Type

The research literature discussed gender as a factor influencing the acquisition of technology literacy skills (Bray, 2007; Cai, Fan & Du, 2017). The researchers conducted a frequency count on the number of user types by gender. Percentage-wise, there seems to be a variation between female and male users identifying as Average and Above Average (see Table 1). The researcher did not find a significant difference between female and male Heavy users.

Age and User Type

In considering age, the researchers found that the 19-24-year-old reported themselves as Above Average users (72%) in comparison to other user types within each group. More than half of the 25-29 and 30-34 year old within their user groups identified as the Above Average (55.5% and 58.3%).

Table 1
Frequency of User Type as Perceived by Survey Participants by Gender and Age

USER TYPE	SAMPLE	GENDER		AGE			
		Female	Male	19-24	25-29	30-34	35-39
Beginner (N)	1	0	1	0	0	0	0
% within group	0.007	0.000	0.007	0.000	0.000	0.000	0.000
Average (N)	24	9	15	9	11	2	3
% within group	18.181	6.818	11.363	12.000	30.555	16.666	33.333
Above Average	85	38	47	54	20	7	4
% within group	64.394	28.787	35.606	72.000	55.555	58.333	44.444
Heavy (N)	22	11	11	12	5	3	2
% within group	16.667	8.333	8.333	16.000	13.888	25.000	22.222
Total (N)	132	58	74	75	36	12	9
% within group	100.00						

Task and Technology Device Used

The survey respondents reported on the technology devices used in completing specific tasks (see Table 2). In the survey, the participants could choose one of the four technology devices identified as their primary tool for completing a task: *Desktop* (value=1), *Laptop* (value=2), *Tablet/iPad* (value=3), and *SMART phone* (value=4). Anticipating that some participants might not have the experience of completing one of the identified tasks or using technology to complete a task, the researchers included a fifth option, *Not applicable* (value = 0).

The data collected provided information on the device type that respondents identified as technology. The 132 respondents identified the *SMART phone* as a commonly used (at least 50%) technology device to complete fifteen personal tasks.

Beyond using a SMART Phone, respondents had other device choices such as desktop, laptop, and tablet/iPad. Respondents identified the laptops receiving a preference of 50% and above for three tasks: "put together an electronic presentation (e.g., PowerPoint)"; "word process papers and assignments"; and "submit an application for school or job." Finally, on average, 10% or less of the respondents reported using the desktop and tablet/iPad as technology

devices in completing specific tasks.

Task and Perceived Technology Use

The survey presented thirty-two tasks that respondents could complete using technology devices such as desktop computers, laptops, tablets or iPads, and SMART phones. Users had three choices to respond when asked for their perception of how frequently they use any technology devices to complete a specific task: "All the time" (value=4), "Most times" (value=3), and "Sometimes" (value=2). Also, users had a fourth choice, which stated "None at all" (value=1) if they had not used any technology or had no experience completing the identified task.

Initially, researchers used 50% and above as a cut-off for the perceived use of technology in completing the job but generated only a task for each choice. Given this, the researcher applied 40% and above as the cut-off point. The data collected from identified five tasks that respondents completed are "All the time" with technology devices; four for "Most times"; and seven for "Sometimes." Most of the tasks involve socialization, entertainment, and information-seeking.

Perceived Frequency of Technology Use

Using technology for communication and entertainment seemed consistent with reports about the amount of time spent on social media (see Table 2) supported by the research literature on activities in another Asian country, the Philippines (Baylen & Arellano, 2018; Gonzales, 2019). As participants were university students, they also utilized technology for academic purposes, albeit less frequently. The findings aligned with the research literature on integrating information and communications technologies in education in other Asian countries (Carbonilla Gorra, & Bhati, 2016).

Table 2
Perceived Use of Technology to Complete Specific Tasks Using 40% and Above as a Cut-Off Point

Perceived Use	Task	*f*	%
All the time	20. search for information on the web.	67	50.757
	4. call friends and family.	65	49.242
	31. watch videos online (e.g., YouTube).	63	47.727
	16. listen to music.	59	44.696
	28. text friends and family.	57	43.181
	27. take pictures or digital images.	54	40.909
Most times	1. access online databases and research articles.	79	59.848
	5. chat with family and friends.	65	49.242
	17. look up words using online reference tools.	65	49.242
	32. word process papers and assignments.	63	47.727
Sometimes	7. complete an online form.	73	55.303
	26. take or complete an online course.	63	47.727
	12. create digital images (e.g., using Photoshop.	60	45.454
	18. make a reservation for a place to stay (e.g., hotel).	59	44.696
	3. buy or sell items online.	58	43.939
	2. build web pages and websites.	54	40.909
	30. view images of places for a vacation.	53	40.151

Technology Devices Used

SMART phones and laptops seemed to be university students' technology devices to complete the tasks identified in this study (see Table 3). For charges receiving 50% or more responses of using SMART phones, many survey participants (mean of 91.5%) reported using the technology device to communicate with others. The survey results also said entertainment for using the same device (85%) and completing tasks related to academic work (80%). Further, several survey participants reported using laptops (62%) in completing academic-related tasks. As the Phnom Penh

economy progressed rapidly in the (third) millennium era and various SMART phones became more affordable, the urban young population became everyday users of the devices, as evident in daily Facebook surfing. Laptop usage came second as academic work does to personal freedom. Nevertheless, laptops are more popular than desktop computers for Cambodian students as universities provide few desktops. The researcher found the device-use results consistent with the literature about access to technology devices in other Asian countries, especially the Philippines (Librero, Ramos, Ranga, Triñona, & Lambert, 2007; Valk, Rashid, & Elder, 2010).

Table 3
Tasks reported by survey respondents as completed using a SMART phone at least 50% of the time

Rank	Task	*f*	%
1	4. call friends and family.	126	95.454
2	28. text friends and family.	122	92.424
3	27. take pictures or digital images.	121	91.666
4	16. listen to music.	117	88.636
5	5. chat with family and friends.	116	87.878
6	30. view images of places for a vacation.	102	77.272
7	31. watch videos online (e.g., YouTube).	95	71.969
8	17. look up words using online reference tools.	88	66.666
9	10. create an online profile (e.g., Facebook).	85	64.393
10	29. translate texts from one language to another	85	64.393
11	18. make a reservation for a place to stay (e.g., hotel).	76	57.575
12	20. search for information on the web.	76	57.575
13	6. check or monitor my finances or bank account.	75	56.818
14	3. buy or sell items online.	67	50.757
15	21. play an online game.	67	50.757

Researchers' Reflections Based on Shared Conversations

Reflections described thoughts resulting from the snapshot research experience and conversations with the Cambodian co-researcher:

- The data provided information that university students have access to technology to support their academic studies and lives outside of the classroom. In reviewing the data, one of the researchers (Cambodian) reflected on its significance in identifying the use of technology to support social and leisure (i.e., entertainment) activities. Further, the same researcher commented that after the Communist governments isolated Cambodia in the 1970s and '80s, Cambodians longed for international contact and experiences in the liberal world, as evident in the popularity of Thai and South Korean film episodes on TV. Cambodian youths and their parents tend to use technology for social and leisure and political activities, as observable in their all-time daily usage of Facebook and YouTube (Chansambath & Chantarasingh, 2017; Vong & Hok, 2018).
- Academic activities supported by technology devices seemed to include tasks related to writing (e.g., searching for information on the web, accessing online databases and research articles, looking up words using online reference tools, word processing papers, and assignments). Anecdotal reports from the co-researchers conversation highlighted the lack of self-discipline among Cambodian students when completing homework assignments, writing, and research. In seeking the researcher's opinion about the topic, the co-researcher mentioned that most Cambodian schools and universities require little homework, writing, and research while relying heavily on exams. The statements, as discussed earlier, needed further investigation with more Cambodian faculty members.
- The data did not identify the completion of hands-on or production-related tasks as supported by technology devices. Due to the lack of ICT in schools, Cambodian students are still relatively less advanced in ICT skills than other students in the region. The survey outcome implies that, despite students' heavy usage, most are followers rather than high-quality multimedia producers.
- SMART Phone is a commonly used and owned technology device to support social and academic activities (Phong, Srou, & Sola, 2016). The availability of affordable new and second-hand SMART phones makes them the most popular instrument in Cambodia. Conversation with the Cambodian co-researcher identified these mobile devices as more reliable than laptops sold in Cambodian stores, especially in hardware durability. Also, based

on classroom experiences, the co-researcher shared that Phnom Penh students take snapshot photos of white-board lecture notes instead of taking notes on a computer.

- Cellular data has become very affordable for most Cambodians within the last few years with the added business competition (Phong, Srou, & Sola, 2016; Vannak, 2019). Although Internet access is not stable in the provinces, it works pretty well in the major cities (Wilwohl, 2016).
- The surveyed students seemed not to favor tablet and desktop devices. Further discussion with the Cambodian co-researcher highlighted the students' lack of device use due to functional limitations, cost, and portability.
- The sample population that completed the survey seemed open to using technology in business, e.g., banking, transactions. The university students' ability to communicate in foreign languages could be an asset for technology use.

Conclusion

Creating multiple snapshots of university students' technology use in different aspects of their lives allowed the researcher to eventually produce a "big" picture for the area, region, and country. The idea of a "big" picture could provide a map for educators and policymakers in developing new and relevant curriculum-based experiences for university students. The "big" picture could also provide university officials with a focus on creating support infrastructures for educational institutions under their supervision, including training and resource allocation.

The researcher recommends further inquiry into the interaction of the demographic factors with students' technology devices' choices and opinions on technology use. Are there significant relationships between elements, tasks, and perceptions? The outcomes of the descriptive study encourage researchers to continue collecting data from diverse groups of participants. A study comparing different age groups, including older adults, could provide insights into technology diffusion from a historical perspective. Also, the expansion of the data collection to other locations such as the neighboring country or region could inform stakeholders on the accessibility and availability of technology devices and the proliferation of technology literacy practices.

Finally, the researcher is encouraged to do further studies focusing on how people acquire technology literacy skills? Where do they learn? How do they know? Are educational institutions the only place where one can become technology literate? The researchers believe that forming a "big" picture could happen by adding more snapshots.

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