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Yuwanuch Gulatee

Vijittra Vonganusith

Jeremy E. Pagram
Edith Cowan University

Martin G. Cooper
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Examining Student ICT Ownership, Use and Preferences towards Electronically Delivered Learning Resources in Nakhon Phanom University and Sakon Nakhon Rajabhat University

Yuwanuch Gulatee,¹ Vijitra Vonganusith,² Jeremy E. Pagram³ and Martin G. Cooper⁴

บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษา 1) ความเป็นเจ้าของของนักศึกษาเกี่ยวกับอุปกรณ์เทคโนโลยีทั้งด้านซอฟต์แวร์และการใช้งาน 2) อุปกรณ์เทคโนโลยีอะไรบ้างที่ครูผู้สอนใช้ในชั้นเรียน 3) การใช้งานระบบออนไลน์ของนักศึกษาที่มหาวิทยาลัย และ 4) ตรวจสอบทักษะการใช้ซอฟต์แวร์ของนักศึกษา โดยมีกลุ่มตัวอย่าง คือ นักศึกษา มหาวิทยาลัยนครพนม และ มหาวิทยาลัยราชภัฏสกลนคร จำนวน 977 คน ปีการศึกษา 2558 โดยใช้วิธีการวิจัยเชิงปริมาณ แบบสอบถาม ซึ่งได้รับการออกแบบมาเพื่อจัดลำดับทัศนคติของกลุ่มตัวอย่าง โดยใช้ Likert Scale เป็นการให้สเกลคำตอบ การสำรวจโดยการออกแบบการวิจัยเชิงปริมาณ ได้รับการพัฒนาโดยใช้ซอฟต์แวร์ Qualtrics ซึ่งเป็นเครื่องมือที่มีการสำรวจวิจัยออนไลน์ รวบรวมข้อมูล สถิติที่ใช้ในการวิเคราะห์ข้อมูล คือ ร้อยละ และค่าเฉลี่ย เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูลเป็นแบบสอบถามมาตราส่วนประมาณค่า มีค่าอำนาจจำแนกระหว่าง 0.44.-0.85 และมีค่าความเชื่อมั่นเท่ากับ 0.85

ผลการวิจัยพบว่า 1) นักศึกษาเป็นเจ้าของ Laptop มากที่สุดร้อยละ 78 รองลงมาคือ Smart Phone ร้อยละ 60 นักศึกษา มหาวิทยาลัยทั้งสองแห่งติดตามเทคโนโลยีใหม่ๆ อะไรบ้าง โดยพิจารณาจากการเป็นเจ้าของอุปกรณ์ต่างๆ ไม่เกิน 3 ปี ทำให้ทราบว่า นักศึกษาซื้ออุปกรณ์ใหม่ๆ อยู่ตลอดเวลา และส่วนมากนักศึกษาใช้อุปกรณ์ดังกล่าวในการเรียนมากกว่าร้อยละ 60 2) ครูผู้สอนใช้ Desktop Laptop และ Projector ในห้องเรียนบ่อยที่สุดมากกว่าร้อยละ 75 3) การติดต่อสื่อสารที่ทางมหาวิทยาลัยจัดให้ เช่น ระบบการเรียน การสอนออนไลน์กลับไม่ได้รับการตอบสนองเท่าที่ควรมีเพียงร้อยละ 20 และ 4) ทักษะในการใช้ Software ที่จำเป็นต่อการเรียน การสอนของนักศึกษามหาวิทยาลัยทั้งสองแห่งอยู่ในระดับกลาง ในขณะที่ทักษะทาง Social Media นั้นอยู่ในระดับดีมาก ดังนั้นจะเห็นได้ว่านักศึกษามีความรู้พื้นฐานในการใช้ระบบสารสนเทศเบื้องต้นที่สนับสนุนการเรียน มหาวิทยาลัยควรมีการติดตามและ วัดผลความสามารถทางด้านเทคโนโลยีสารสนเทศอย่างต่อเนื่องทุกปี เพื่อให้ให้นักศึกษามีความกระตือรือร้นและปรับปรุงตัวเองให้มีพื้นฐาน ที่ดีขึ้น และส่งผลต่อการทำงานของนักศึกษาในอนาคต

คำสำคัญ : อีเลิร์นนิ่ง / เทคโนโลยีสารสนเทศ / การเรียนการสอนออนไลน์

ABSTRACT

The objectives of this research were 1) to find students' ownership of technology devices, ownership, software facility, and preferences, 2) to find out what devices instructors use in the classroom, 3) to find out how the students use the online learning that the university provided for them, and 4) to examine students' software skills. The questionnaire and the interview instruments were designed to clarify participants' attitudes, and used a Likert scale. Surveys and qualitative research design were developed using Qualtrics software, which is an online research survey tool that can be used for a whole range of data gathering purposes applicable to Higher Degree Research.

¹ Assistant Professor, Department of Information and Communication, Faculty of Management Science and Information Technology, Nakhon Phanom University

² Assistant Professor, Department of Foreign Languages, Faculty of Humanities and Social Sciences, Sakon Nakhon Rajabhat University

³ Senior Lecturer, Department of Communication and Art, Faculty of Education, Edith Cowan University, Australia

⁴ Lecturer, Department of Communication and Art, Faculty of Education, Edith Cowan University, Australia



The samples are the students in both universities (Nakhon Phanom University and Sakon Nakhon Rajabhat University), a total of 977 people. A statistical computer program was employed. The entire reliability value was 0.852 and the discrimination index was between 0.28 and 0.76.

The results disclose as follows: 1) Most of the students owned laptop (78%), followed by the smart phone (60%). The two university students owned devices up to 3 years, showed that students purchase new equipment all the time. Many students claimed that they used such devices in class (more than 60 %). As well as smart phones, students used them every day and more than 2-3 times (50 %). 2) The teachers used desktop computers, laptops and projectors in classrooms most frequently (> 75 %). 3) Only 20% of the students accessed communication channels provided by the universities, such as eLearning system, compared to other channels, such as Facebook. And 4) the students' software skills required for studying are only at intermediate level, whereas their social media skills were advanced. As a result, it could be seen that most of the students lacked basic knowledge in using information technology for study purposes. Therefore, the university should have ongoing monitoring and measurement in respect of information technology competency as those technologies could constantly provide students with enthusiasm and give opportunity to improve themselves which is a good basis for future work and education.

Keywords : E-Learning / ICT Technology / Online Learning

Introduction

This paper reports partly on a large project carried out among western universities and two Thai Universities, Nakhon Phanom University (NPU) and Sakon Nakhon Rajabhat University (SNRU). The examination of technologies' facilities and application, and students' self-perceived technology capabilities and preferences at two Thai universities is reported. The investigation was undertaken through an online survey of students at Nakhon Phanom University (NPU) and Sakon Nakhon Rajabhat University (SNRU). The sampled universities were selected for several reasons, namely: being a public university, the level of commitment to participate in a study, their preparedness to represent technology use of learning environments and to keep pace of technology changes in teaching practices and learning processes. The universities also identified their needs to embed technology use for their curriculum and resources. Therefore, the respondents were students enrolled across all fields from both universities.

The survey sought information from students at higher education level in order to address the student

ICT ownership, use and preferences towards electronically delivered learning resources at two Thai universities. It was anticipated that the answers to these questions would be useful to administrators, course coordinators, and lecturers in tailoring the resources to student preferences and thus it would result in delivering greater student engagement and satisfaction. The adoption and impact of technologies use on teaching practice and learning achievement have driven the interest of policy makers, educators, and researchers worldwide. There are many universities in Australia, UK and the United States that realize the benefits of implementation of technologies. For example, many Australian universities offer online learning resources by delivery of course content through Blackboard. Some approach web enhancing existing materials while other educational providers choose to package learning materials and develop similar learning approaches to offer pedagogical opportunities provided by technologies. Nevertheless, research conducted by (Gulatee & Pongthano. 2015) indicated that learners did not recognize online learning to be necessarily beneficial due to the lack of peer-to-peer interactivity between learners and instructors.



Although most online units provide student access to chat and discuss through forum facilities to encourage ongoing interaction, finding time to participate and lacking immediacy are barriers, as supported by the respondents above. Discussion forums can be an effective tool to promote student interaction by providing for shared information or exploring problem-based scenarios (Gulatee & Nilsook. 2015), since they provide a permanent record of the discussion that students can review at a later date. Discussion forums allow students to revise, review and reflect using the permanent record to refine their understandings. However, if students and instructors do not use an active participation in the discussion forums regularly, the benefits of this type of communication channel will remain less utilized. In addition, (Gulatee & Pongthanoo. 2015) indicated that even though the staff within a school utilizes a range of communication technologies such as discussion forums or bulletin boards, email, chat, blogs and wikis to encourage student discussion and information sharing, peer-to-peer communication and interaction is an issue in the online environment. More recent research in the US has revealed that one out of every four teenagers goes online using their mobile phones (Madden, Lenhart, Duggan, Cortesi, & Gasser. 2013). The research also reported that 78 percent of the teens now have a mobile phone, and almost half (47 percent) of them own smartphones. This can be seen that young people tended to use handheld devices for both study and non-study support. The situation in some Asian countries is similar. The researcher and the experiences of practitioners have highlighted the technological education environment in improving the abilities of societies to cope with changes. Similarly, the uptake of technologies at Thai higher education level has become an essential tool of students' learning both inside and outside the classroom (Pagram & Cooper. 2012). Therefore, a variety of technologies can be seen at the instructional levels, including digital camera, laptops, and interactive whiteboards (Cassidy et al. 2011). The advanced use of the software tools in the extent of producing better quality resources and use in the

classroom has been studied and resulted in positive outcomes. Taking the above into account, the researchers saw the importance of investigating how students utilized and responded to online materials that were delivered to them through their courses. Also of interest were the technologies owned by the students and the modes and places of internet access.

Objectives

1. To explore students' ownership of technology devices, ownership, software facility, and preferences.
2. To examine the types of device that instructors use in the classroom.
3. To explore how students use the online learning systems provided for them by the university.
4. To examine at what degree students rate their own software skills.

Research Methodology

Population and Participants

Population in this study was students enrolled across all fields from both universities. The total number of students was 382 from SNRU and 595 from NPU by using accidental sampling technique. Of the samples of 977 students from both universities, 574 were female and 403 were male. NPU students comprised 58 percent female students and 42 percent male students, and SNRU students comprised 60 percent female students, and 40 percent male students. In terms of the study field of the sampled students, the number of students are mostly even across the field level. Approximately 80 percent of participating samples from both universities were between 19 and 22 years of age.

Research Instruments

To address the above research questions a survey was developed using Qualtrics software, which is an online research survey tool that can be used for a whole range of data gathering purpose applicable to HDR research. In addition, in the light of the technology focus



of the study, the administration of the student survey being conducted online via the internet was appropriate. Moreover, the size of the participating students was also required for more efficient means of data collection. Students of both universities were informed of the survey via a link placed on NPU and SNRU websites. It is acknowledged that this method of recruiting students for the survey skewed the samples towards the more ICT proficient students. It is therefore reasonable to assume that the samples represented the middle to the upper end of students in terms of ICT ability. There were 15 questions that were grouped according to the following categories: Demographics, Digital lifestyle: your skills, ownership and access, file formats, Learning Management System (Moodle).

Data Collection

The survey was conducted by using a constructed closed-ended questionnaire. The survey in Thai language and data entry were via drop down menus and radio buttons to ensure an uncluttered layout and accurate data entry. Finally, a progress bar indicated how far participants were through the survey to encourage them to continue through to the end. Further a prepaid card was offered as a prize to a random student that completed the survey. It was anticipated that the answers to these questions would be useful to administrators, course coordinators, and lecturers in tailoring resources to student preferences and thus deliver greater student engagement and satisfaction.

Data Analysis

The data was analyzed using quantitative research method through a statistical computer program by displaying the number (N), the sum (ΣX), the percentage (%), and the average (\bar{X}) of the data presented.

Result and Discussion

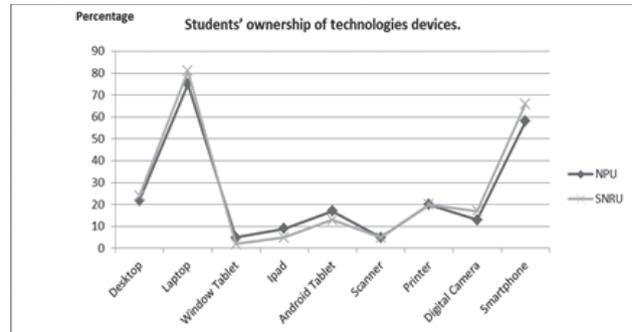


Figure 1 Students' ownership of technology devices.

The students' ownership of devices was examined. The items comprised students' ownership of personal desktop computer, Laptop, Windows Tablet, iPad, Android tablet, Scanner, Printer, Digital camera, and Smartphone. Results in Figure 1 for ownership of devices are very similar across both universities. Figure 1 indicates that more than 70 percent of participating students from both universities owned Laptops, while approximately 60 percent owned Smartphones. Overall, most of the students owned Laptops, followed by Smartphones. Numbers of students owning desktop Computers, Printers, and Android devices, Digital Cameras, iPads, Scanners, and Window Tablets were considerably lower. This seems to indicate a significant move toward mobile technologies in terms of current ownership and purchasing patterns. It can safely be assumed that the student population of the future will be armed with laptops and 3G handheld mobile devices. It also can be seen that the Laptop and handheld mobile devices have become affordable and provide students access to resources, people, and community (Companies and Markets.com. 2015) In other words, many students possess or have access to a device that can be used as a learning tool.

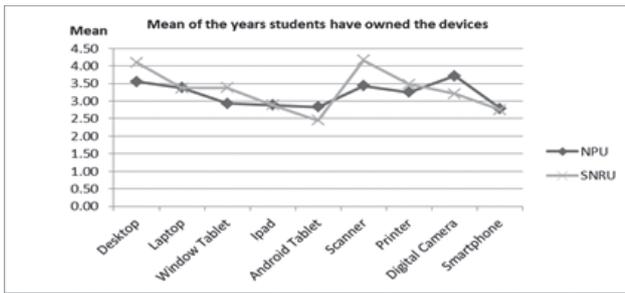


Figure 2 Mean of the years students have owned their devices

As an additional indication of ownership, the students were asked to rate the year length of technologies devices' ownership. The SNRU students tended to own Desktop and Scanner for longer periods, compared to NPU students. On the other hand, NPU students were likely to own digital cameras more than SNRU students. Modern technologies such as Smartphones, IPads and Window Tablets also appear as being used evenly by both groups of university students.

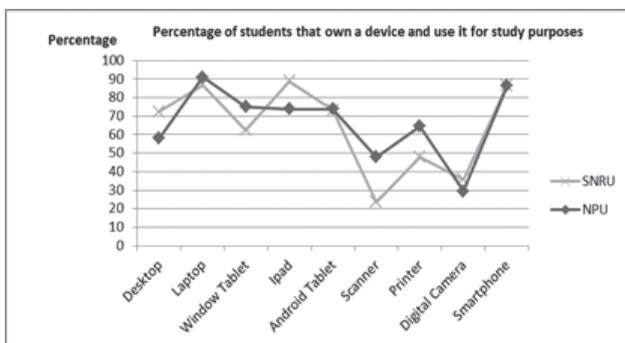


Figure 3 Percentage of students that own a device and use it for study purposes

The responses from both universities reported even numbers of Laptop and Smartphone use for study purposes on an everyday basis. On the other hand the SNRU students tended to use IPads for studying more than NPU students. There were some students from both universities indicating that they did use Android Tablets, Window Tablets and Desktops for study support. Most commonly, students reported that they used technologies on an everyday basis. Interestingly, the students from NPU

tended to use printers and scanners, compared to SNRU students, indicating that some students may prefer paper-based learning strategies, or a blend of technologies. In the study, it can be seen that using mobile devices for Thai teens provides greater advantages for both outside and inside the classroom. The integration of mobile devices into teaching practice would be appropriate, as young people are familiar using these technologies. The ongoing provision of technology application training is also needed for teachers and students to keep up with advances in technologies.

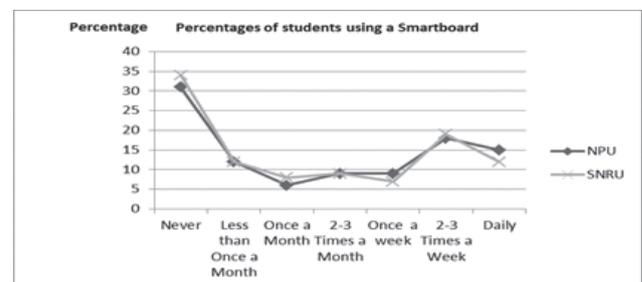


Figure 4 Percentage of students using a Smartboard

The scale NEVER was the highest number of responses from both universities for electronic whiteboard use for study purposes. Only half of the student groups from NPU use the devices for daily basis or two or three times a week. This figure suggests that the electronic whiteboard could be more fully introduced into the classroom (Gulatee & Pongthanoo. 2015).

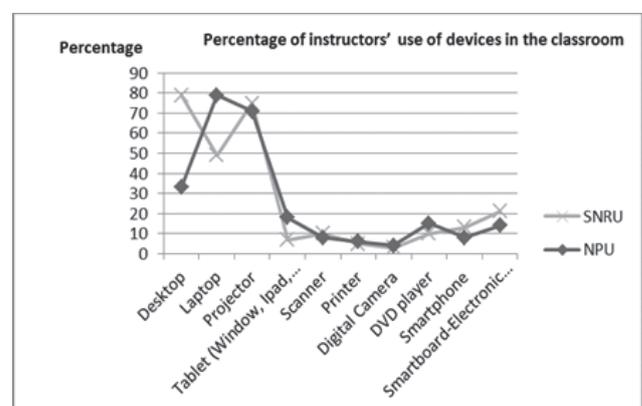


Figure 5 Percentage of instructors' use of devices in the classroom



The integration of technologies into the classroom revealed that SNRU teachers had the highest number of responses for the use of desktop computers and projectors, compared to NPU teachers who tended to use Laptops instead. The figure illustrates that SNRU is likely to provide more computer facilities in the classroom than NPU, whereas the limited provision of Desktop computers at NPU meant most teachers use individual Laptops for teaching practice. There were also fewer responses reporting the application of other technologies into practice, such as Smartboards and Tablets (Window, IPad). The integration of other devices such as scanners, printers, digital cameras, DVD players, and Smartphones can be seen but with less consistent application.

Table 1 Student responses to “Do you use cloud computing?”

| Responses | NPU | SNRU |
|------------|-----|------|
| Yes | 58 | 51 |
| No | 23 | 22 |
| Don't know | 19 | 27 |

Access to other platforms, such as cloud computing (Google Drive, Dropbox, SkyDrive, One Drive or other Cloud based solutions), was also examined. Over 50 percent of the students from both universities said they used cloud computing storage. Approximately 21 percent of students from both universities did not use or did not know what the program was or how to use it. In the study, Thai students were not familiar with the modern technology changes. Therefore the needs of developing their current skills and abilities in using the devices could be an appropriate intervention.

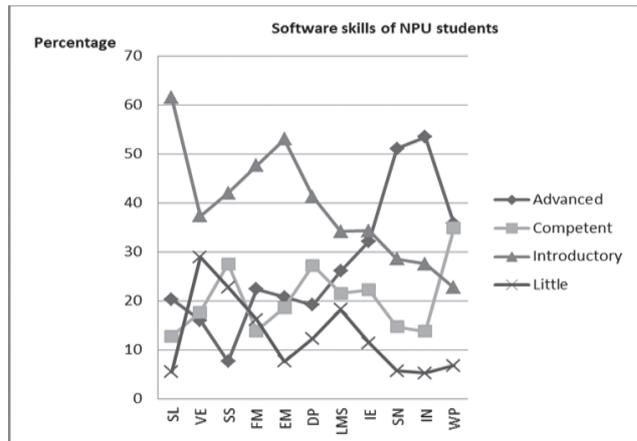


Figure 6 Software skills of NPU students

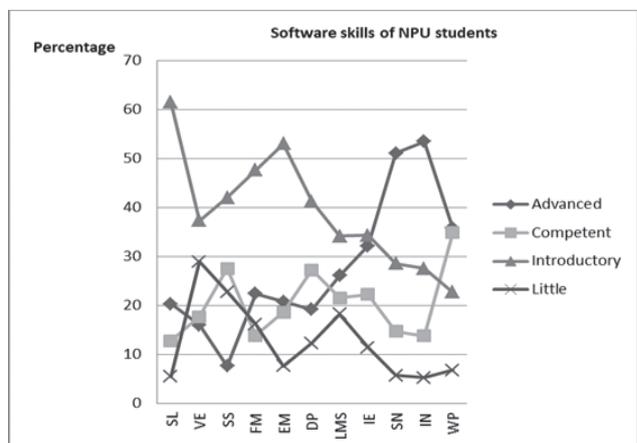


Figure 7 Software skills of SNRU students

Note: SL = Slideshows, VE = Video Editing, SS =Spreadsheets, FM= File Management, EM=Email, LMS=Course Management Software, IE= Image Editing, SN= Social Networking, IN= Internet Browsing, WP = Word Processing, DP=Digital Photography.

Participating students from both universities perceived themselves as having high skills in social networking such as Facebook. As found from the research by Gulatee & Pongthanoo (2015), more than 90% of the students at NPU University preferred to communicate with their lecturers and friends in their class via Facebook rather than the LMS system. As mentioned in Morgan & Tilley (2013) “Management system must be turned into a more social experience, delivering not just prescribed courses but also a self-driven learning experience with free and open”. This can be interpreted to show that LMS has not been fully introduced into both universities. The

participating students reported high confidence in the use of word processing. The use of word processing suggests that the students were using computers for text-based content. The figure also could be interpreted to show that the students felt confidence in using computer for word processing and social networks. The students' basic skills from both universities showed similar results in terms of using slideshows, internet browsing, digital photography, image editing, and email. The course management software (Blackboard & Moodle) was also unfamiliar to use. The responses on the remaining items spreadsheets and file management were perceived as the lowest skills. In the study, since the students accessed the internet through their own handheld devices and Laptop, the students were able to practice and develop better technology skills at home. Consequently, the integration of these technologies into the classroom setting would be appropriate for modern classrooms as a useful adjunct to support their academic goals.

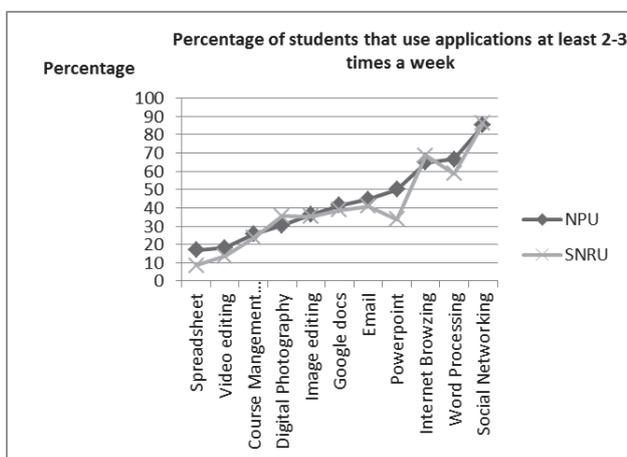


Figure 8 Percentage of students that use applications at least 2-3 times a week

Note : SS=Spreadsheet, VE=Video Editing, LMS= Learning Management System, DP=Digital Figure 8. Percentage of students that use applications at least 2-3 times a week

Note: SS=Spreadsheet, VE=Video Editing, LMS =Learning Management System, DP=Digital Photography, IE=Image Editing, CC=Cloud Computing, EM= Email,

SL=Slideshows, IN=Internet Browsing, WP = Word processing, SN=Social networking.

The questionnaire as to how often students use these technologies (Microsoft Word, PowerPoint, Microsoft excel, searching engine, digital photography, image editing, VDO management, Social network (Facebook, email), online system, and cloud computing) for study support is explored. Social network is the most popular device that both participating student groups preferred for study purposes. Word processing and Internet Browsing were also applied to learning in an even number. Half of NPU students use PowerPoint more than the SNRU students. Email, Google Docs and image editing were also used for study support of both participating student groups. Spreadsheets, video editing, course management software and digital photography were also used for study support but less than other items. These findings suggest further research may be fruitful in the application of social network strategies of content delivery and learning approaches, particularly in relation to combining other technologies in the social networking environment.

Table 2 Percentage of students indicating the Internet use of at least 2-3 times a week

| Location | NPU | SNRU |
|------------------|-----|------|
| Home | 52 | 36 |
| 3G | 72 | 64 |
| University lab | 44 | 15 |
| University Wi-Fi | 68 | 31 |
| Internet cafe | 20 | 7 |

For NPU students, there is a clear trend towards accessing the Internet on their smartphones and university Wi-Fi, followed by home, university labs and internet cafés, whereas the SNRU students' usage also includes 3G, followed by home, university wireless, university labs, and internet cafes. The results show that students from both universities normally use the 3G network because it



is more convenient with the devices they own compared to the university provision of computer access. As well as, the 3G network and the World Wide Web connections via internet providers in Thailand are both relatively affordable and thus contribute to home internet access being widely used.

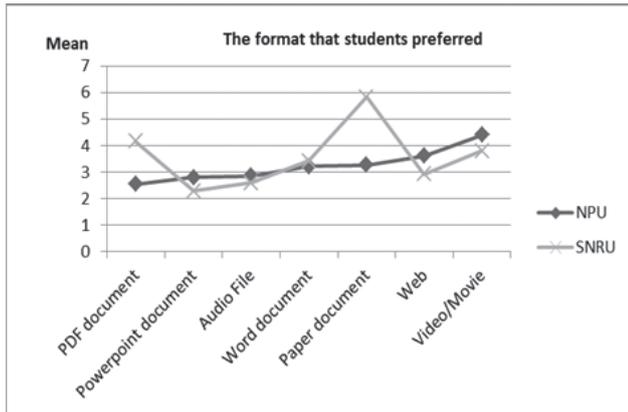


Figure 9 The format that students preferred

The teaching material format the students prefer most was ranked by mean score. The paper document was ranked as the most preferred for SNRU students, compared to NPU students. Similarly, SNRU students preferred PDF documents rather than teaching materials format in terms of audio files. PowerPoint documents were preferred by some NPU students, but on the whole NPU students tended to prefer the format of electronic delivery than the other university students, such as Web, Video or Movies, Audio files, and PowerPoint documents. In contrast, SNRU students were likely to prefer text-based media.

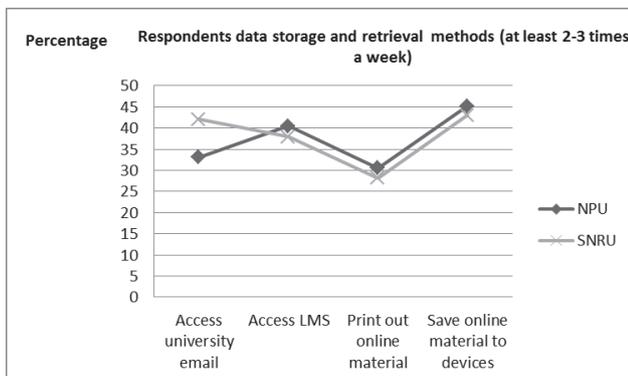


Figure 10 Respondents data storage and retrieval methods (at least 2-3 times a week)

The question of the students' software facilities and preferences was also conducted. Figure 10 shows that both participating student groups tended to save online material to devices rather than printing it out. The figure also shows that less than 50 percent of the students from both universities were likely to use the LMS system. It can be interpreted that the LMS system was not fully introduced into the universities' facilities. However, the similar number access through university email of the sampled student groups appeared lower than 50 percent. From the table, 42 percent of the SNRU students tended to use the university email, compared to the NPU students.

Conclusions

Overall, the results indicate that for the most part students in both universities are not embracing cutting edge technologies; whereas computer ownership, including laptops and smartphone, is high. Students' desire to use technologies such as Podcasting and video is low, preferring more traditional file formats such as .doc and .pdf which can be printed and do not require much interpretation. Students also tend to save and store documents as opposed to editing or interacting with them. Other evidence of Education students' lack of technological savvy is illustrated by the low ownership levels of items such as G3 mobile phones, although the expense of these items may also be a factor. It is clear from the evidence that universities such as SNRU or NPU cannot assume that students have the higher order skills required to access and use materials deployed in more innovative ways such as podcasting/video, etc. While students indicated a desire to learn more about these formats, there is no place within their education course to learn these skills. This is likely to result in underused materials and student frustration in being unable to optimally access and use them. The authors believe that when new ways (technologies, file-formats) for distributing learning materials are introduced, some form of student support/training is required that is



demonstrative of the manner in which the students can optimally utilise these new methods to enhance their learning. These findings are interesting in the context of training the next generation of teachers. The current study compounds this problem in that it shows that SNRU and NPU students exhibit a comparatively low uptake of new technologies. Some of the issues found were related to access, facilities and resources. At the higher education level, as an outcome of the investigation, Thai students have opportunities to access a great variety of modern technologies for study support. There has still been a substantial improvement in ability to give students a new way of learning for accommodating the students' needs rather than the needs and limitation of the technology. Overall the study has shown an ongoing need to examine students' use of ICT at SNRU and NPU

and how this is related to the materials provided. Still, these variables constantly change and it is incumbent upon a university of the 21st century to monitor students' technology ownership and use and have an adaptive approach to both technology and pedagogy.

Suggestions

1. For more information, the researchers should collect the In-depth Interviews data with some students to provide more specific results.
2. The university should improve and promote the e-learning system to teachers and students, to use widely in the classroom.
3. The university should provide sufficient access to technology devices in the classroom.

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