Where Do Digital Natives Start and Finish? Lecturers' Use of Technology in Three Thai Universities

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Abstract
Teachers' ownership of technology devices, their access to software and web-based utilities, and their preferences when using technology are the subject of this ongoing research. The devices that instructors' use in the classroom, how teachers use online learning systems as provided by the university, and teachers' skill levels when using technology for learning are also examined. The major objective of this research is to provide a long-term comparative analysis across several universities to determine if teachers' use of technology for teaching-learning is developing or has changed to reflect how their students use technology in their daily lives. Such ongoing data collection and analysis will inform individual institutions about online learning and how to improve facilities for both staff and students for maximum educational success. The initial study was conducted in 2014 in one thai university and expanded in 2018 to include responses from lecturers in three universities. This paper reports on the initial findings of the larger 2018 study and explores how lecturers use technology for teaching. Findings indicate that lecturers in these three universities were using social media channels such as line and facebook to stay in contact with their students and with each other. Email as a formal means of communication to staff and between staff and students was almost defunct, with use declining in all three universities. However, the findings also show that lecturers were unlikely to integrate and embed technology in their classroom programs and showed some resistance to trying new technology for teaching purposes. It was concluded that the university should continue to conduct ongoing monitoring and evaluation of students' and lecturers' information technology competencies.

Keywords: Lecturers E-Learning, ICT Technology, Online Learning

Introduction

This paper reports on lecturers' use of technology in their teaching programs in three Thai Universities, two located in the north-east of Thailand and one in Bangkok. The universities were selected for several reasons including being a public university, the level of commitment to participate in the study, preparedness of the university to encourage technology use in teaching-learning environments, and to keep pace with technology changes in teaching practices and learning processes. The universities also identified their need to embed technology use in curriculum and the development and access to teaching-learning resources. The three universities represented a variety of locations, status, and were developed via partnerships and the combination of existing educational organisations. They therefore offer a range of courses at different levels, including academic training at the vocational, higher vocational, undergraduate and graduate levels, and PhD. Two universities in particular, provide a range of courses which are designed to cater for and respond to local needs in the north-east region of Thailand.

The investigation reported in this paper was undertaken through an online survey of lecturers at the three Universities as outlined above. The survey sought information from lecturers working in higher education in order to explore issues such as ICT ownership, lecturer use and preferences and attitudes towards delivering learning resources and tools electronically. It was hypothesised that the answers to the survey would provide useful information to establish some baseline data about the way technology is used for educational purposes by teaching staff in universities in Thailand. The adoption and impact of technologies used in teaching practice and the assessment of learning achievement have driven the interest and funding of universities by policy makers, educators, and researchers worldwide (Howard & Mozejko, 2015). There are many universities in Western and Asian countries that purport to leverage the benefits of technology in higher education learning environments (Howard & Mozejko, 2015). This research explores the extent to which lecturers actually use technology in teaching-learning environments across three universities in Thailand.

Background

Since 2014 the authors of this paper have been conducting an ongoing research project in Thailand that aims to track changes in how students use technology for learning. However, this study examined the other side of the learning-teaching paradigm and explored how lecturers use technology in the classroom, their ict ownership and their preferences and attitudes towards delivering learning electronically, resources and tools. Results from the research will be useful to administrators, course coordinators and lecturers in tailoring resources to deliver better student engagement, higher learning, and higher levels of student satisfaction. How technology is used by lecturers, personal ownership of devices, and preferences and attitudes often determine how technology is used by students for learning, rather than for social purposes only. The research also considers what technologies lecturers use in the classroom to deliver learning programs and resources to their students throughout their courses. Future research would provide ongoing data about changes in the use of technology for teaching-learning by both lecturers and students to ensure that universities are delivering the best programs for students.

Research instruments

A survey was developed using Qualtrics software, which is an online research survey tool that can be used for a range of data gathering purposes applicable to Higher Degree Research (HDR). Since the research focusses on technology use in teaching-learning programs by university lecturers, the administration of the survey was conducted online via the Internet. Using an online survey method was also the most cost effective and time efficient way to gather data from a large group of lecturers. "Surveys and questionnaires are tools that enable the researcher to investigate trends and characteristics that are present within a population" (Pribyl, 1994, p. 195). Using the survey method enables the researcher to gain "a snapshot of the current state of affairs in a given group or population" (Janes, 2001, p. 419), in this case lecturers working at university level. The Web was chosen as a delivery platform for the survey to provide access to the maximum number of participants. Using the Web is cost effective, allows for rapid data collection and turn-around time (Nancarrow, Pallister, & Brace, 2001), and is a reliable alternative to telephone surveys (Braunsberger, Wybenga & Gates, 2007). Anonymity is afforded to participants who complete an online survey and allows them to answer questions in a non-threatening environment. Since all lecturers had access to the Internet, coverage error (Couper, 2000, p. 466-467) was not a problem for participants, who were also encouraged by their university to participate in the research.

Participants were informed of the survey via a link placed on the university websites. There were nineteen (19) questions in each survey that were grouped according to the following categories: demographics; experiences in teaching; ownership and digital lifestyle; skills and access; and file formats and learning tools being used in the classroom. The survey questionnaire and follow-up interview questions (not reported here) were designed to collect data about and to clarify participants' attitudes to technology use in the university classroom. The surveys used a 5 level Likert scale (Krosnick, et al., 2002). Survey questions were close-ended and included both Thai and English language versions. The de-identified respondent data (to ensure issues of privacy, confidentiality and security (Couper, 2000)), was fed into a common database for analysis. The survey and data entry used drop down menus and radio buttons to ensure an uncluttered layout and to encourage accurate data entry (Nancarrow, Pallister, & Brace, 2001; Pickard, 2007, p. 183-200; Williamson, 2000, p. 217-223). Finally, a progress bar indicated how far participants were through the survey to encourage them to finish.

Data Analysis

The research used both quantitative and qualitative methods to gather data about lecturer use of technology for teaching (Pickard, 2007, Williamson, 2000). Using both types of approaches allows for the triangulation of findings, so the researcher can be more confident of the results as a representation of a snapshot in time of human behavior (Jick.1979). Results using the quantitative method are reported in this paper and used web-based questionnaires (Wang & Doong,2010, Greener, 2011). The data was analysed using SPSS software and the data sets discussed here include the descriptive statistical analysis only. The data from the questionnaire was analyzed using quantity (N), the sum ($\sum X$), the percentage (%), the average and ( ).

Findings

Demographic Information

Participants in this research consisted of a range of lecturers who were teaching across all faculties in the three universities. The total number of participants was 256, of which 127 were female (49.61%) and 129 were male (50.39%). The participants were aged between 22-60. the number of participants from each university were also very similar with university #1 29 %(75), #2 35% (89) and #3 36% (92). Nearly half of the lecturers (48.44%) had more than 11 years of teaching experience in the university environment. These facts are represented graphically below in figures 1 and 2.

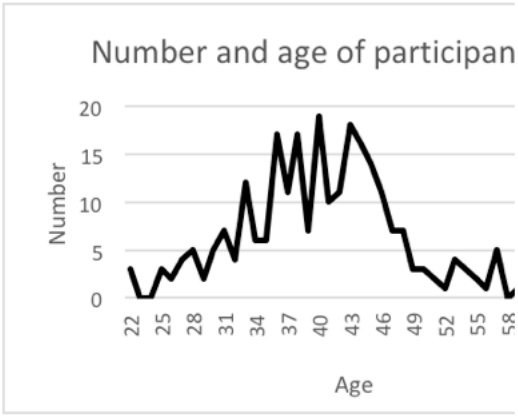

Figure 1: number and age of participants

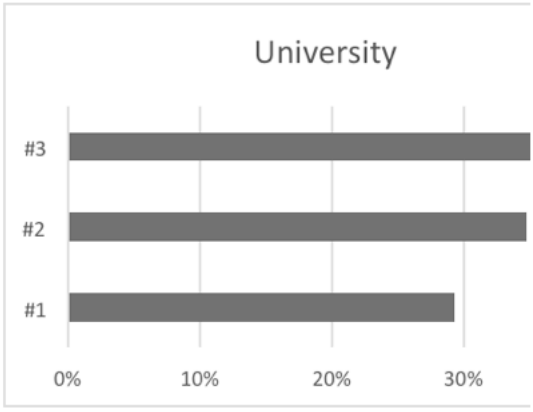

Figure 2: university participant representation

Teaching experience

Forty-six percent (46%) of the participants had a Masters degree in their area of specialisation and forty-seven (47%) had a PhD. These results indicate that the average education for university lecturers in Thailand is at least at a Masters or PhD level. However, a small number of the Bachelor Degree qualified lecturers who participated is due to the inclusion of vocational classes available in university #1 and #3. these results are available in figure 3 below.

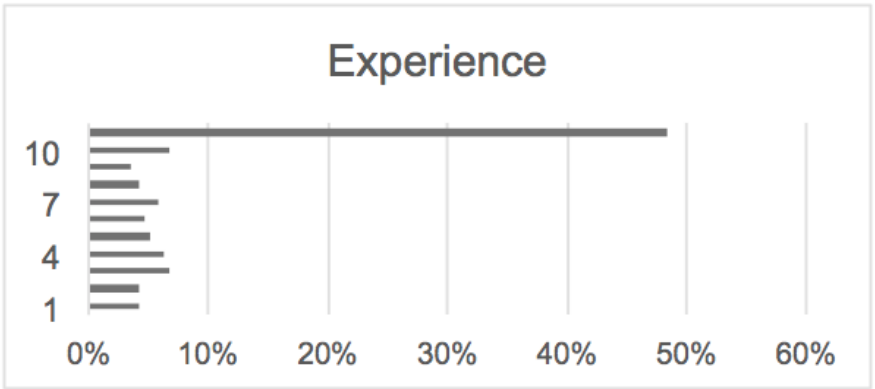

Figure 3: Participants' teaching experience at university

Universities worldwide now aspire to having teaching staff who have qualifications at masters or PhD level, especially universities that focus on original research agendas and the graduation of higher level degrees such PhD (Wolcott, 2018; Griffioen, 2018).

Ownership and digital lifestyle

In the study lecturers were asked to describe themselves as an internet user and to provide details about their use and attitudes to technology for teaching and communication. The results for all three universities are reported in the figures below. Figure 4 illustrates that lecturers had the highest number of responses for owning a smartphone, a laptop and a printer. There were fewer responses reporting ownership of tablets (window, android and iPad). Other research has also found that ownership and use of a printer is still high amongst all age groups and that people tend to print when they want to engage with information at a deeper level (Combes, 2013). Readers who print read more carefully off printed paper, have stronger emotional responses and they remember more. Significantly, they read better when they use printed pages rather than screens for reading comprehension (garage staff, hp development, 2018).

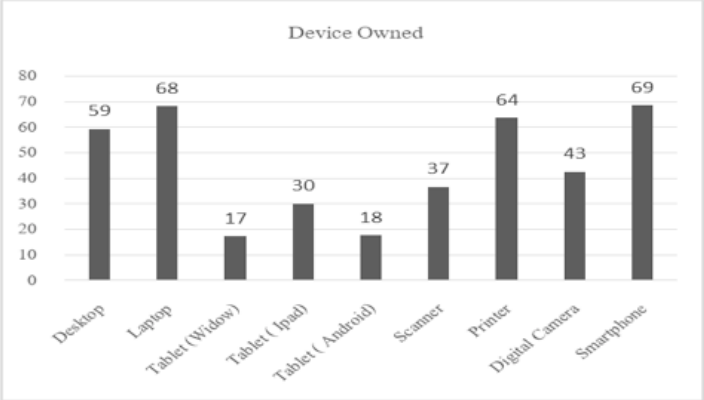

Figure 4: Lecturer ownership of technology

Using Technology in the Classroom

Lecturers in this study were using a range of technologies in the classroom. The most popular tools were the laptop, pc and digital projector which suggests that power point slide presentations and connecting to the internet are major ways of embedding technology into classroom programs. These results are shown in figure 5.

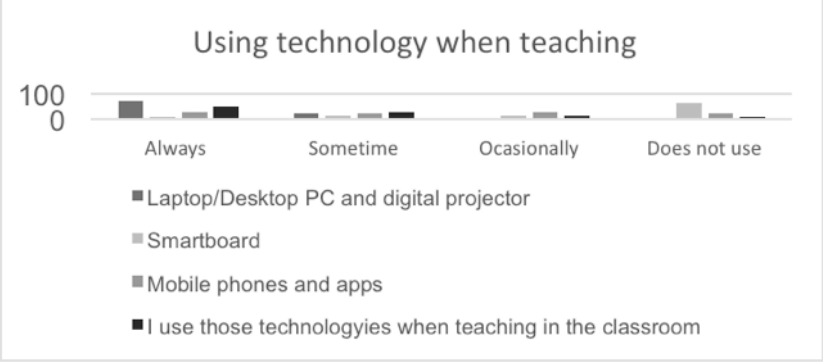

Figure 5: Using technology when teaching

Participants were also using other devices in large numbers. Participating lecturers from all three universities said they were using social media as a teaching tool and communication channel with their students. Lecturers and even the vice chancellor in one university use the social media platform line to communicate with staff and students. Research by Gulatee & Pongthanoo (2015) found that more than 90% of the students at university #1 preferred to communicate, discuss and post their work with their lecturers and friends via social media, rather than via the learning management system (LMS). This finding supports Morgan & Tilley (2013) who maintain that the learning "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 discussion on abundant resources". To be used successfully, the LMS must be perceived by students to be a social as well as a learning space. Results in figure 7 indicate that the LMS either has not been fully introduced into the three universities at the lecturer level, or there is some resistance to using it due to student preference for social media (Gulatee & Pongthanoo,2015).

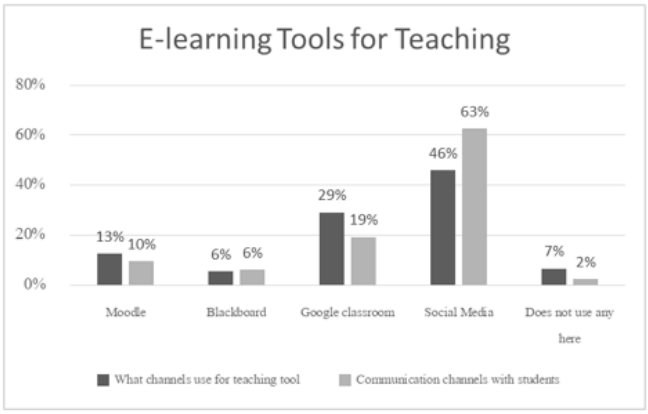

Figure 6: lecturers' use of social media tools for teaching and communicating

Almost all the lecturers (91.77%) said they taught themselves to use the internet, with the rest (6.06%) learning their skills from friends. These results mirror their students who also print and teach themselves how to use technology (itō et al, 2010, Combes, 2013, Gulatee & Combes 2018). Research that focuses on how students use the internet indicate that they are not taught how to use it effectively and efficiently, and as a consequence, tend to use it superficially, ineffectively and inefficiently, and often unethically (Combes, 2013). They also adapt their technology use to meet specific needs and often use it differently to the intended use by the developers. Other research (lei, 2009; So, Choi, Lim, & Xiong, 2012) indicates that younger pre-service teachers are tech-savvy using basic technologies and the internet (social media) for socialising and communication, but they do not appear to integrate technology into their curriculum programs. Since the average age of participants in this study was between 37 and 46 years of age (figure 1), lecturers at these universities do not fit into the net generation or millennial age group. Results in this study show that while lecturers say they like using the internet on an everyday basis and feel very confident using it, they are not as confident about their ability to embed technology in teaching-learning programs. These results are displayed in table 1.

Table 1: describing myself as an internet user

Question	Responses			
I learnt to use the internet (n=256)	Taught myself	From friends	From teacher	From family
	219	20	8	9
I like using the internet (n=256)	Like a lot	Like	Do not like	Dislike a lot
	97	130	18	11
I am confident using the internet. (n=256)	Very confident	Confident	Ok	Not confident
	114	111	25	6
I am confident finding specific information for teaching (n=256)	Very confident	Confident	Ok	Not confident
	150	82	16	8
I am confident finding specific information for leisure (n=256)	Very confident	Confident	Ok	Not confident
	152	83	15	6
I am confident using the internet publishing (n=256)	Very confident	Confident	Ok	Not confident
	106	104	33	13
I am confident downloading information from the internet (n=256)	Very confident	Confident	Ok	Not confident
	151	79	19	7
I am confident using the internet to collaborate with my peers (n=256)	Very confident	Confident	Ok	Not confident
	152	81	17	6

Results displayed in table 1 indicate that lecturers were generally confident using the internet for downloading, collaboration with peers, finding information and using the internet for teaching. However, there is still a small number (between 9 – 18%) who are not confident, and do not like using the internet. Their responses may be due to inadequate training. Since they all taught themselves to use the internet, universities must be aware that lecturers require consistent, updated training on how to use technologies for teaching-learning purposes.

Table 2: technology used during lectures

Question	Responses			
I use a polling tool technology during lectures (n=256)	Always	Sometimes	Occasionally	Do not use
	69	97	59	31
I use search engine services for reference in class work (n=256)	Always	Sometimes	Occasionally	Do not use
	71	102	61	22
I use plagiarism software such as turnitin my class (n=256)	Always	Sometimes	Occasionally	Do not use
	37	62	55	102
I use innovative technologies such as touch screens, and virtual reality (n=256)	Always	Sometimes	Occasionally	Do not use
	37	58	50	111
I use video recordings in class to be used again for review (n=256)	Always	Sometimes	Occasionally	Do not use
	29	48	64	115
I use simulation/games in class (n=256)	Always	Sometimes	Occasionally	Do not use
	32	72	84	68
I use youtube, khan academy and itunes in class (n=256)	Always	Sometimes	Occasionally	Do not use
	48	102	71	35
I use e-portfolios (n=256)	Always	Sometimes	Occasionally	Do not use
	20	45	43	148
I use and promote e-books (n=256)	Always	Sometimes	Occasionally	Do not use
	35	71	81	69

Some of the participants in this survey were using a range of tools such as polling tools, youtube, search engine services for references, khan academy and itunes when teaching in class. However, these lecturers were in the minority. A small number were using e-portfolios, video recordings of class sessions for later review, and more innovative technology such as touch screens and virtual reality for their classroom teaching. Hence, while lecturers were using social media platforms to communicate with students, their use of technology as teaching tools and resources, were limited.

E-learning tools in the classroom

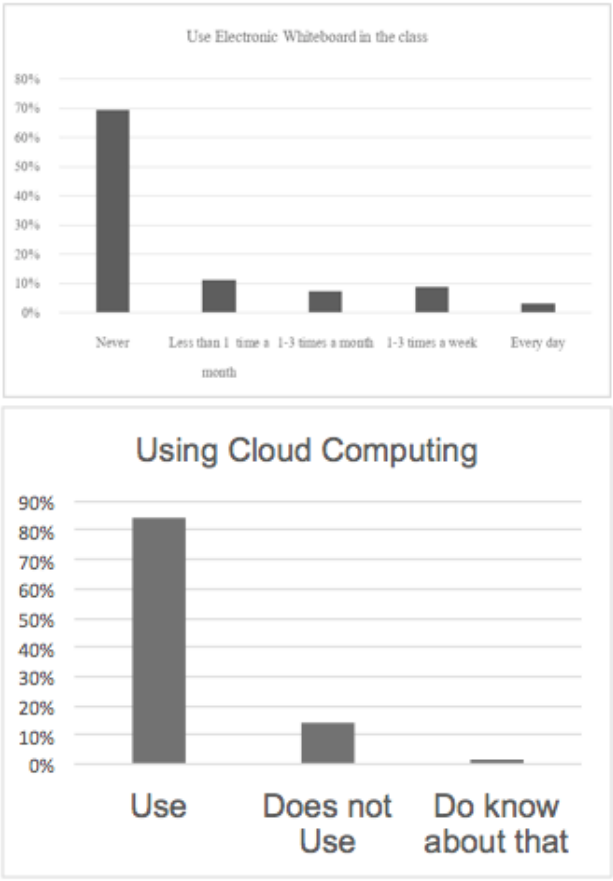

Figure 7: Lecturers use of the electronic whiteboard and cloud computing for teaching

The results displayed in figure 7 show that lecturers were not using electronic whiteboards in the classroom, but most were aware of and using (80%) cloud computing. These results once again suggest that lecturers had not received training in how to use the electronic whiteboards or they were not commonplace in the classrooms at these universities.

Software Skills

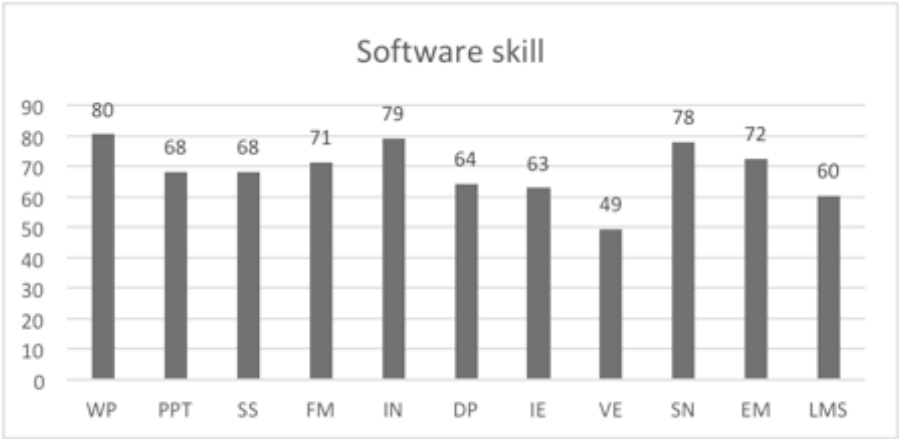

Figure 8: Lecturers personal perception of their software skills

Legend: WP = word processing, PowerPoint = ppt, SS =spreadsheets, FM= file management, IN= internet browsing, DP=digital photography, IE= image editing, VE = video editing, SN= social networking, EM=email, LMS=learning management system

Figure 8 is interesting as lecturers obviously felt they had good software skills, with word processing, file management, internet browsing, social networking and email scoring up to 80% of respondents. These results reflect lecturers' personal perceptions of their skill levels. This does not mean that their understanding of their own skill levels is high. For instance, most people use a word processing program much like a type writer, rather than using the full functionality of the program. Bearing in mind that these lecturers taught themselves how to use the internet, the same is probably true for other types of software. Software that requires extra knowledge such as video editing scored much lower skill levels. As technology develops and artificial intelligence (ai) is incorporated into software programs and web-based utilities, how the user uses the software is prescribed by the software which may limit how it is used by the user. Young people are more likely to adapt how they use technology, so it meets their personal needs (Combes, 2013), but this aspect is one that requires further investigation with older age groups, particularly in a teaching-learning context. The results in figure 8 also indicate that ongoing training for staff is an important issue.

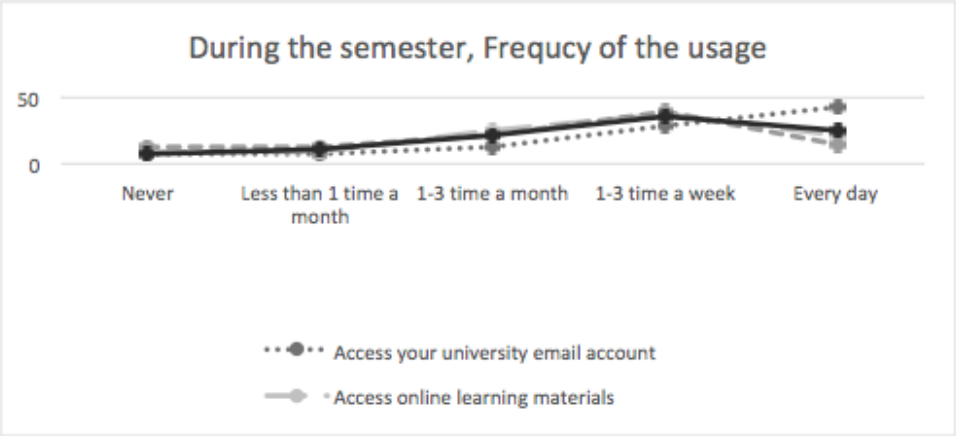

Figure 9: Lecturers frequency of use during semester

Figure 9 indicates that 40% of lecturers across the three universities use their university email and online learning materials on average, 1-3 times a week. Many lecturers also still print learning materials on a regular basis (40%). Disturbingly, there is still 7-13% who never use technology or use it only once a month (7-13%). This finding seems to be at odds with the previous results in figure 8 where lecturers appear to be confident in their use of technology. Perhaps the universities need to reconsider their training programs and include specific training on how to integrate technology into teaching-learning programs and to make this an ongoing commitment to developing staff expertise.

Conclusion

The most interesting findings from this study indicate that lecturers in these three universities were using social media channels such as line and Facebook to stay in contact with their students and each other. Email as a formal means of communication to staff and between staff and students was almost defunct, particularly in one

university which used line to contact staff and students. In this university, social media channels were now considered to be the official means of communication by the university, with official documents being posted by the vice chancellor and senior executive of the university as a private group for staff only or students only. The fact that information via the social media channels only needed to be posted once for the group to view, could be a reason behind this shift from email to social media as a means of formal communication. Students and staff could also upload photographs of documents, assignments and forms to the university as required using a mobile phone.

While lecturers were using social media channels for communication with other staff and students, their integration and use of technology in the classroom was minimal. While lecturers understood the term cloud computing, and used it regularly, technology in the classroom was limited to power point and basic word processing. Lectures were still being delivered in the traditional way (talk) where students sit and listen to the lecturer. Participatory teaching where students are involved in the learning process by using polls and virtual reality, is not a feature in these classrooms.

There is still a small, but significant group of lecturers (between 10-20%) who report a lack of confidence when using technology and they have poor technology skill levels. The frequency of use by these lecturers indicates that they are unlikely to integrate and embed technology in their classroom programs and furthermore, will probably become resistive to trying any new technologies in the future.

Universities must be mindful that lecturers as well as students need to be taught how to use technology for teaching and learning, particularly since lecturers and students teach themselves how to use technology. Using technology as a teaching and learning tool requires a different skill set to using it for communication and social/leisure activities. Just as teachers need to keep up to date with research and changes in education, so too must they be mindful of changes in technology and how it can be used effectively in teaching-learning programs.

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