A STUDY OF THE USE OF BLENDED LEARNING/ ONLINE LEARNING TOOLS IN A HIGHER EDUCATION INSTITUTION IN AN ASEAN COUNTRY

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ABSTRACT

Blended learning (BL) tools are increasingly used in higher education (HE) due to global technological advancements. BL tools for this study are online tools integrated with face-to-face teaching that support program management and expedite some educational processes like assignment submission. Importantly, BL can enhance the development of students' higher cognition skills through the communication and active learning it supports. Academic staff who design and implement BL programs are key parties in BL implementation. However, there is limited information available on academic staff uses and perspectives on BL. This study addresses this gap by drawing on a large-scale quantitative survey and responses to qualitative open-ended questions of members of the academic staff in a private HE institution in Malaysia. The study investigates what digital tools they used in their teaching, why they used them, and their impact on their students' learning. We found that the tools most used were limited in their support for students' higher skills development and were mainly used for efficiency in program management. We recommend that staff professional development (PD) in BL be required. The study adds to the BL literature as it advocates for staff technological skills development fused with pedagogical approaches to develop students' higher cognitive skills.

Keywords: *blended learning, higher education, academic staff, 21st century learning skills, program management*

INTRODUCTION

Blended learning (BL) is defined as using online tools to complement face-to-face teaching (Alammary et al., 2014). Examples of BL include using videos in teaching, electronic assignment submission and marking, and learning management systems (LMS). While BL is not a new concept (Atef & Medhat, 2015), as a hybrid of face-to-face classroom lectures and the online platform (Garrison & Kanuka, 2004; Graham et al., 2013; Holenko & Hoić-Božić, 2008) it overcomes the limitations of just elearning or face-to-face learning (Alammary et al., 2014). Studies of BL and student learning in higher education (HE) discuss BL implementation, but there is little research on the experiences of academic staff in successful BL implementation in higher education (Torrisi-Steele & Drew, 2013). This study of a private higher education institution (HEI) in Malaysia is based on a survey of a large proportion of the academic staff.

It presents a snapshot of their uses and views of BL and the online tools used at the HEI. Significantly, data such as this provides ground-level and vital information for HE policy makers and practitioners as they seek to implement best practices for BL.

One major finding of our study is that the online tools the staff used most often supported efficient program management, while the tools used less often increased students' subject understandings and, importantly, supported students' active learning and higher-level cognitive skill development. Through the open-ended survey question, we found that staff requested professional development (PD) in BL to optimize student learning (Halverson et al., 2017). This should be more than technical skills training; it should blend pedagogy (in the form of higher cognitive skill development) with the technical aspects of BL. Further, in maximizing BL benefits for learning, the staff reported that the students also required BL orientation and transition. This is a telling and unexpected finding in today's hyper-connected and technologically driven world, where students seem technologically attuned and competent.

Like other countries, Malaysia strongly encourages BL implementation. The Education Blueprint 2015–2025 (Higher Education) (Ministry of Education Malaysia, 2015) proposes that BL account for 70% of programs by 2025, which will widen access and enhance the quality of teaching and learning. Thus, this study is timely because it clarifies HEI academic staff's use of BL tools, the impact of BL on academic programs and student learning, the challenges posed by BL, and BL's potential for enhanced student learning.

The questions addressed in the survey were directed at the HEI's academic staff and explore their perceptions of the use of BL in their teaching and the online tools they used (survey question 1), and why they adopted BL and what they see as its impact on student learning (survey question 2), as well as open-ended comments from respondents on BL. The research questions for this study are as follows:

RQ 1: What are the forms of BL/online learning tools used in undergraduate programs at the HEI?

RQ 2: Why do academic staff incorporate BL in undergraduate programs at the HEI?

This paper provides background information of HE BL, followed by the research methodology, and then the results and discussion vis a vis the research questions. The paper concludes with recommendations for future action for effective BL in HEIs.

BACKGROUND

Worldwide technological and communication development has shaken up education (Chai, 2018) and shifted learning methods (Fleming et al., 2017; Mozelius, 2014; Raphael & Mtebe, 2016), so that BL permeates HE globally. BL can expand access to HE and enhance the quality of HE teaching and learning (Ministry of Education, Malaysia, 2015).

Functions of Digital Tools in Blended Learning/ Online Learning

BL includes tools that have differing educational functions that range from compact discs (CDs), animations, audio, and multimedia used in a face-to-face classroom style (Kazu & Demirkol, 2014), to social networking via Facebook and Twitter and using an LMS for students and teachers to communicate and collaborate (King, 2016; Lee et al., 2020; Lim & Lee, 2013, 2014; Ng et al., 2013). Additionally, there are tools for assignment submission and marking and resources that can be accessed. While these BL online tools differ in their educational functions, there is limited information available on BL systems to be able to categorize such tools. Thus, the Knowledge Management System (KMS) concept in general is helpful. The KMS categories for tool functions of Lee and Lim (2011) and Angela Lee and Lim (2015) can be applied to a form a BL KMS. Lee and Lim's (2011) tool functions are: (1) "automating routine function" which in a BL KMS is the program management function; (2) "enabling detailing of tasks" is the educational function of promoting students' understanding of subject matter; and (3) "providing for creative activities" lines up with BL supporting creativity, problems solving, communication, and active learning.

Blended Learning Tool Functions

As this study draws on the pedagogy of student-centered, active study for the 21st century (De George-Walker & Keeffe, 2010; Saavedra & Opfer, 2012), rather than a teacher-centered, transmission of information (Biggs & Tang, 1999; Lee et al., 2020), it is valuable to determine the functions of BL tools and identify the pedagogical impact of the tools used.

The literature shows two main functions and advantages of online educational tools: (a) organizational, to improve program management; and (b) pedagogical, to enhance students' academic performance (De George-Walker & Keeffe, 2010). These functions align with the BL KMS categories above because (a) is aligned with Lee and Lim's category 1, and (b) is aligned with Lee and Lim's categories 2 and 3, which are seen on a spectrum ranging from supporting students' understanding to problem solving and creative thinking.

Organizationally, online learning tools include those that facilitate administrative communication such as email, conferences, quick resource access, expediting assignment submission and marking, student enrolment, and attendance. Pedagogically, student learning enhancement through a greater understanding of the subject matter is supported through tools like CDs, animations, audio, and multimedia in traditional face-to-face classroom style (Kazu & Demirkol, 2014). Along the spectrum of student-centered active learning are social networking via Facebook and Twitter and using the LMS to support student-teacher communication and collaboration (King, 2016; Lee et al., 2020), as well as using simulated work environments (Schech et al., 2017). Through these both local and international students' cross-national learning collaboration in real world projects is enabled (Edwards et al., 2003), especially in large undergraduate classes (Chan, 2016). For example, Facebook usage helps students' active learning through peer/teacher interactions in online discussions (Kabilan et al., 2010; McCarthy, 2010). Courses that use synchronous and asynchronous learning methods provide for student diversity with the best of face-to-face and online worlds (Glazer, 2012). Such interactions stimulate positive attitudes by allowing students, especially those with diverse backgrounds, to respond at their own pace (Green et al., 2012; Lee & Lim, 2014; Zhao et al., 2005).

Involving students in their learning via the tools above enhances their academic achievement (Tsai, 2015). Alternatively, merely transferring didactic-style face-to-face teaching to online has limited impact on learning quality (De George-Walker & Keeffe, 2010). The virtual spaces created through the relevant tools allow flexibility, interaction, and collaboration that leads to exposure to different perspectives on topics and issues resulting in deep learning through critical thinking and joint problem solving (Oakley, 2016, p. 69), within and across the students' subjects (Biggs & Tang, 1999).

Preparing students for effective participation in the 21st century, where knowledge evolves rapidly, requires new solutions to issues (Crosling et al., 2015), and BL supports student independence by moving from teacher-centered to student-centered approaches (Crosling et al., 2009) that position students to identify problems and solutions. This approach may not be fostered in the traditional HE lecture format (Lim & Wang, 2016).

Constructivist Pedagogy and Blended Learning/ Online Learning

This study of academic staff BL experiences is underpinned by constructivist pedagogy advanced by the theorists Vygotsky, Dewey, and Piaget (Picciano, 2017). Student learning is promoted through student-centered, active and independent study (Prosser & Trigwell, 1999), where staff engage with students to stimulate learning that is active and independent rather than passive (Biggs & Tang, 1999). Teachers and students' interactive engagement (Picciano, 2017) is a complex social process, and learners construct knowledge through interacting and discussing (Anderson, 2011) and via social cognition (Fernando & Marikar, 2017). Thus, technology aids interaction, and communication facilitates learning (Bates, 2015). The online tools potentially develop students' study approaches (Jeffrey et al., 2014) so that they can seek meaning and understanding through tools that support interaction and communication, critical analysis, and creative thinking, as required for the 21st century (De George-Walker & Keeffe, 2010; Saavedra & Opfer, 2012). BL develops students' technical skills for the digital knowledge society (Mitchell & Forer, 2010), and fosters flexibility and independence with students accessing their learning online when they want (Graham & Robinson, 2007; Jeffrey et al., 2014).

Reasons Why Academic Staff Use Blended Learning

Discussions of BL's impact on student learning explains why staff use it. BL affects students' academic performance through the more active study approaches. Studies show that those learning by BL performed better than those who do not use it (Garrison & Kanuka, 2004; Means et al., 2009;

Sitzmann et al., 2006). Thomas et al. (2017) found lower achieving students accessed online tests more than higher achieving classmates, providing them with greater contact and interaction with their study materials. However, even with a range of online tools, students continue to value face-to-face teacher interaction (Herath & Crosling, 2012).

Academic Staff and Blended Learning Implementation

The literature shows that the role of academic staff is instrumental in BL program design and student uptake (Lim & Wang, 2016). However, as staff are in the main disciplinary specialists rather than educational or technology-enhanced experts (Lim & Wang, 2016), both staff PD and student BL training underpins its effectiveness in enhancing learning (Fisher & Newton, 2014). Despite academic staff's key BL role, little is known about their experiences with it. In program development relevant to learners' needs, knowledge of the teachers' backgrounds has long been acknowledged as essential (for example, Schwab, 1973). Thus, it is important to appreciate staff attitudes and use of BL to identify their strengths and weaknesses and address these to implement BL to enhance students' academic achievement.

Previous studies of BL implementation in HEIs in Malaysia indicated that academic staff perceive themselves as novices needing support in the use of technological implementation and curriculum design. While not providing specific details, Wong et al. (2019) found that in their HEI in Malaysia, a lack of training and development were major obstacles to implementing BL. Ma'arop and Embi (2016) were more detailed about the needs for successful BL implementation, with staff technical and pedagogical development required for it. However, they did not specify further regarding the focus for the pedagogical development. Prakash and Samu (2018) found in their study in Malaysian HE that staff need to understand digital tool usage to motivate students with given tasks, but again they did not elaborate further on how this may relate to student-centered active learning.

This study explored the specific functions of BL tools used in a HEI and is a valuable contribution to the literature. Categorizing the tools used most often by academic staff allows for the identification of the areas of pedagogical strength and weakness and where development is required. This provides a clearer focus for staff PD so BL can contribute to student learning and higher levels of student achievement.

METHODOLOGY

The mixed method study included quantitative survey data and qualitative data from respondents' open-ended question comments (Johnson & Onwuegbuzie, 2004). The comments provided a deeper view that broadened the responses from the survey questions, such as their positive and less enthusiastic opinions of BL, their concerns, and their future aspirations. We obtained approval for the project though the university ethics committee.

The Survey Instrument

We developed the survey instrument to address the research questions about academic staff and BL in undergraduate degrees at the chosen HEI. It is not compulsory at the HEI for staff to include BL in the teaching program, but they are encouraged to do so. One rationale for this encouragement is that BL provides students with another way for them to study and express their understanding. As not all staff at the HEI were required to use BL, this study aimed to collect and understand staff BL use in their classrooms and their reflections.

The survey drew on: (1) The United Kingdom UCISA survey instrument (Walker, et al., 2014) on technologies to support teaching, learning, and excellence, framed by the United Kingdom's Teaching Excellence Framework; and (2) the learning elements framework (Passey, 2013) of digital technologies for differing learner's competencies, challenges, and student interactions.

The survey questions responding to the two research questions were as follows:

Survey Question 1: "What forms of BL (i.e., the online learning tools) do you use in your program or subject?"

Survey Question 2: "How do you use these specific forms/tools in your program or subject?" and "What is the impact of the BL on student learning in your program or subject?"

For these questions, the respondents were presented with a list of items related to the question (see Appendix 1 for a list of the survey items). The respondents were asked to indicate with a "tick" (√) those items from the list that applied to them. The staff could tick as many of the items as they wanted on the list for each question, which indicated their

use and response. The open-ended question asked respondents for their comments about their BL experiences in their teaching, learning, academic program, or subject.

Data Analysis

We used Microsoft Excel to organize and perform general statistical analysis on the survey data. Common descriptive statistics of frequencies, percentages, mean, and standard deviations were calculated for each survey item to provide descriptive information about respondents' forms of BL and tool usage, inputs on BL tools and educational functions, and their reasons for using BL. Charts were also generated through the statistical software to illustrate how respondents used BL for teaching their courses and how its use has impacted their courses.

The frequency analysis of the survey data was done as follows: For the forms/tools of BL used, the number of ticks (√) by the respondent to each of the items on the survey was aggregated (that is, the number of staff using each item was established). This determined how may staff had used each form/tool.

We assessed the educational functions of the forms/tools used by applying Lee and Lim's (2011) KMS functions as aligned to education for the digital tools/items listed on the survey. These categories are: (1) "automating routine function," (2) "enabling detailing of tasks," and (3) "providing for creative activities." The digital tools/items were grouped according to Lee and Lim's (2011) KMS for education (see Appendix 2 for the categories of tools/items). The number of ticks for the tools/items in each category were tallied, and the overall number/frequency for each category was compared with the others.

For the respondent comments in the open-ended question of the survey, we used content analysis to establish themes across the comments. We applied the manual coding method to extract important themes from the qualitative data, particularly in relation to the respondents' perceptions about the benefits and issues of BL usage in their courses. Table 1 provides the themes we formed. The comments were allocated to the relevant theme and the number (frequency) of comments for each theme was aggregated.

Online and hard copies of the survey were sent to all the HEI's undergraduate program academic staff. The overall pool of possible respondents was informed of the study and the survey was promoted electronically and by word-of-mouth through the schools and departments. The respondents self-selected to complete the survey. Data were collected over two months in mid-2017. The results for the study were obtained from the completed survey forms of 142 academic staff (42.77% of the HEI academic staff). These 142 staff represented the overall population of staff in the seven HEI departments: School of Business, Department of Computing and Information Systems, Department of Art, Department of Biological Sciences, Department of Hospitality, Department of Psychology, and Department of Mathematics and Sciences. This sum of 42.77% of the staff who participated in survey is close to half of the population pool of academic staff at the HEI. The results are thus indicative as the respondents represented all the HEI's academic undergraduate sections.

The survey covered the demographic profile of the respondents and items to measure the constructs. We pretested the questionnaire with 20 selected academics who had experience with BL. The question structures were afterwards refined on the survey instrument based on the pretest. We assessed the reliability of the measures using Cronbach's alpha to measure the inter-item consistency among the items. The alpha for all the independent variables and dependent variables ranged from 0.882 to 0.821 and exceeded the minimum acceptable value of 0.7 (Nunnally, 1978). Therefore, no items were deleted. An example of the statistical processes completed on the data is in Appendix 5 on ways that staff use BL in their courses.

RESULTS

Blended Learning Forms/Tools Used

For RQ 1, we found that the most used digital forms/tools fit with the function category for promoting management and efficiency of educational programs. Appendix 2 shows that the number of staff who used tools in this category was N = 634. Of the tools in this category, the most used was the Learning Management System (LMS) (N = 119), followed by email (N = 111). Also highly rated were BL for assignment submission (N = 100), access to resources on other sites (N = 64), and announcements and calendar access (N = 53). These promote efficiency but do not necessarily enhance learning

through higher level cognition. Interestingly, with the advent of worldwide social networking, the survey items in category 3 of the BL KMS, students' social networking and engaging students in online discussion, accounted for only N = 110.

The next most often used set of tools at the HEI are ones that promote students' understanding and learning through various multimedia forms (Appendix 2), so students can better understand subject content and check their understanding by: "Using videos in teaching" (N = 100), "Providing quizzes or access to online response systems" (N = 40), and "Providing online survey or question session" (N = 28). The survey comment testified to such use:

> *I find it helpful for students to understand the subject matter, it makes learning more interesting students are more engaged and their interaction and understanding on the subject.*

The least used BL forms include those that support students' creative thinking through communication and active learning: "enabling the creation of eportfolios" (N = 12), "using Skype or video-enabling tools" (N = 14), and "using collaborative tools such as wikis and blogs" N = 21. Those tools that facilitate student and teacher communication, active learning, and critical analysis and problem-solving skills (Oakley, 2016), were relatively low. However, some survey comments revealed the potential that some academic staff perceive of BL:

> *To replace lecture and focus more on the problem and discussion during face-to-face contact hours.*

Creatively, one academic used BL as follows:

> *Besides the lessons I have created, I get students to prepare lessons to share. This gives greater peer learning engagement.*

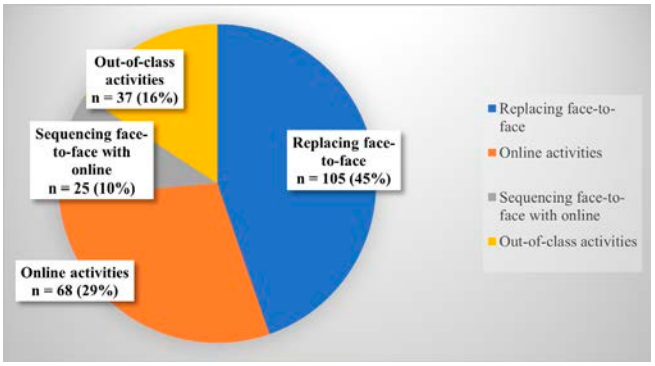
Taking an overall perspective, a typical survey respondent comment is that BL's potential for fostering deep and meaningful study at the HEI is limited:

> *Here it [BL] is in its infancy and needs to be encouraged among staff to see it is a valuable resource to learning.*

How Bended Learning is Used in Courses

Referring to RQ 2 on the way BL was used and as seen in Figure 1, staff mostly used BL to replace some face-to-face classroom teaching activities (N = 105; Appendix 1).

Figure 1. Ways BL Used in Respondents' Courses



The reliability values were all above 0.7, as suggested by Nunnally (1978), so we concluded that the variables were reliable measures. On the surface, the most cited use, Replacing Face-to-face teaching with BL, indicates that BL is integrated in the academic programs of many respondents as seen in this respondent comment:

> *It is an effective tool for large classes.*

However, the comment below indicated a lack of incentive to use BL:

> *I don't feel any reward or recognition to spend too much time focusing on upgrading.*

The two next most popular ways BL was used are "providing additional online activities" (N = 68), and "out of class activities" (N = 37). Both are promising and suggest that staff are integrating BL into their program, rather than using it only for managerial purposes. However, with a smaller number of responses indicating "staff sequencing face-to-face with online activities" (N = 25), the inclusion of BL tools seems ad hoc and not systematic and juxtaposing face-to-face and BL tools rather than having them complementing each other to achieve the subject's learning outcomes. Despite this, there was recognition of the need for a systematic approach as seen in this respondent's comment:

> *The implementation of blended learning*

should be well planned ahead in order to ensure effectiveness and coherence.

An optimistic view of BL from another survey comments was:

Another string to the teacher's bow. It is not a threat to the teacher but a tool that is more familiar to the student and can be used to enhance face-to-face teaching.

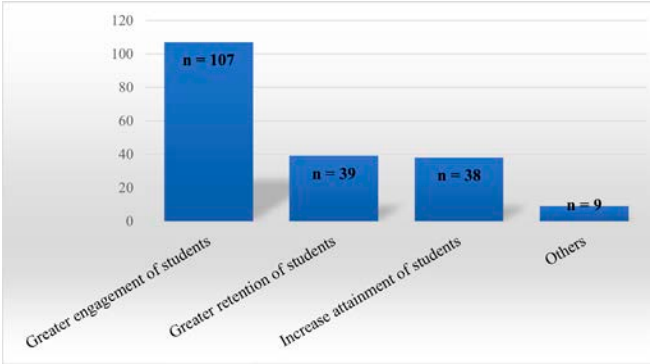
Reasons Staff Use Blended Learning

For RQ 2 on why academic staff use BL, Appendix 3 shows that the major reasons fit the category of promoting program management and efficiency: "students could access study information" (N = 129), "easier access to resources" (N = 102), "enhancing students" understanding" (N = 91), and "providing more support for teaching" (N = 78). Less popular reasons were: "for study revision purposes" (N = 0), and "enabling more empathetic thinking" (N = 0). The mean values ranged from 3.78 for subjective norm to 3.99 with standard deviation values of 0.74–0.91; further details of this analysis can be found in Appendix 5.

However, some of the least supported reasons for staff use of BL are to assist students' active learning to support higher level cognition and to develop 21st century skills that require critical thinking and problem solving. These functions are: "supporting synthesis of ideas and knowledge" (N = 12), "encouraging reasoning and interpretation" (N = 14), "encouraging evaluation approaches" (N = 15), "leading to more written output" (N = 16), "enabling more focus on analysis" (N = 19), and "generating greater enquiry and questioning" (N = 20).

Another aspect of RQ 2 on why staff use BL is the staff views on how BL impacts their courses. Staff acknowledge BL's benefits for student learning, and as shown in Figure 2, "greater student engagement" is perceived by the highest number of staff as the biggest impact (N = 107). Staff indicate they use BL mostly so students can "access relevant information and resources." This was followed by "greater student retention" (N = 39) and then by "increased student attainment" (N = 38). Echoing the findings of the categories of the tools used, academic staff indicated "increased attainment" with only 38 responses (N = 38), suggesting that efficient management of the program is the main purpose of BL. The respondents' specific interpretation of student engagement was not identified, but generally it was seen to be motivated and participating students. While greater engagement and retention of students received together (N = 146), these are foundational rather than instrumental in impacting academic achievement. They set the scene for enhanced academic achievement.

Figure 2. Impact of BL on Course



Academic Staff Comments on Blended Learning

The open-ended survey comments provided interesting staff perceptions on issues related to their use of BL across the study's research questions. The comments indicated that staff appreciated BL's benefits but were ambivalent and expressed the need for PD that blends pedagogical understanding about active learning with the technical skills for program management. Staff also revealed the students' reluctance to incorporate BL in their study. From a total of 71 comments in the survey's open-ended comment question, the themes established through content analysis and the number of comments per theme are indicated in Table 1.

Table 1: Themes of Open-ended Comments

Theme	Number of Responses in Each Theme
BL enhances teaching and learning	N=25
Staff Training in BL required: Staff do not know how to use blended learning	N=19
Students need to be encouraged to use BL so they can appreciate its benefits for their learning	N=18
Staff do not like BL	N=5
Students do not want to use BL	N=2
Student do not understand how to use BL	N=2
Total	N=71

The highest number of respondents perceived BL as beneficial in teaching and learning enhancement (N = 25). The next most popular theme (N = 19) was that staff require more training to operate with BL, as this comment shows:

> *I use it less because of unfamiliarity with Blackboard as a VLE (I need training).*

Interestingly, this theme is followed by the view that students expect face-to-face teaching and need encouragement to use BL (N = 18):

> *The students lack of understanding would make the application redundant.*

and, pointedly,

> *Students must take the initiative to access and engage.*

The next theme is that some staff have negative attitudes to BL (N = 5), and the least common responses were that students require training in using BL (N = 2) and that students do not want to use BL (N = 2).

DISCUSSION

The tools most often used by the academic staff in their teaching at the HEI in this study were for program management purposes. We perceive that efficiently managed programs facilitated by BL tools do benefit students in that they avoid confusion that can lead to students' disengagement from their courses. For instance, efficient access to resources and assignment submission help clarify managerial processes for students. BL also provides the opportunity for HEIs and academic staff to enhance their students' academic outcomes through higher order skill development and greater learning engagement. However, the tools for the function of learning enhancement were less often used at the HEI in this study.

The reasons program management is emphasized may be that, in the Southeast Asian cultural context, both staff and students have largely experienced a teacher-focused method of learning. Staff in the study thus made available for students the links to readings and resources, rather than the tools to facilitate cognitive skills development. For example, Campbell (2007) explained that more recent government policies in China supporting elearning in HEIs has been problematic because senior academics refuse to change their teaching styles, and the Chinese education system is based on Confucian values and thus examination driven, and teacher centered.

The emphasis on management tools might also be because BL is a relatively new educational approach and staff are coming to terms with its attributes and methods. At this stage, they may prefer tools they can master readily and through which they can see a managerial impact on the program, rather than tools that have an evaluative and analytical thinking impact the way they teach. For example, Liu and Cheng (2008) in a HEI in China found that while students there were very positive about BL, academic administrators lacked awareness of its benefits.

At the same time, we found that a number of tools used in the study do facilitate communication and active learning and provide the space for creative thinking and problem solving, as discussed earlier. These include review activities, online subject quizzes, and question sessions. This is promising, but the use of these tools needs to be consolidated and extended broadly in the HEI. The study found that staff perceive BL's impact on their courses as enhancing learning and teaching. However, the tools they mostly use support program management and efficiency, rather than skills development. This suggests a gap in staff understandings about BL's possibilities for student learning and higher skills development. Thus, BL PD needs to align pedagogical approaches to skills with technical skills development.

Academic staff appreciate how BL can enhance their programs, but their survey comments indicate that they do not feel ready to do so because of a lack of time and the skills to further enhance their students' learning. Undoubtedly, it is daunting for staff with research as well as teaching imperatives to implement what they see as time-consuming BL learning activities. While they may have attended sessions demonstrating the benefits of particular online educational resources for enhancing their students' learning, it is another step for them to implement these resources online without support, especially if technical difficulties occur. Again, these can lead to frustrations and disengagement for staff from BL applications.

Drawing together the points above and as is evident in the survey comments, the staff believe

they require more training and PD in BL. This supports the view that PD is required (Garrison & Vaughan, 2008; Thomas et al., 2017). Lack of PD and support is a significant barrier to the best practice of BL implementation (Mitchell & Forer, 2010). Although they did not outline the specific elements of suitable PD, Salter (2006) stated that PD should be based on sound pedagogy for BL curriculum design and implementation and provide guidance in innovative and interactive approaches. This means that BL tools do not just repeat existing practice in an online environment. A key contribution of this study that arose from exploring the tools used, BL for students' cognitive skills development is relatively weak at the HEI. This study, elaborating on Salter's (2006) comment above, thus further clarifies and provides details of the type of PD required for BL.

The study's finding that the academic staff believe that more training in BL is needed is not one sided. Survey comments as seen in Table 1 indicate that students are also an important party in successful BL implementation. For instance, the staff commented that students need encouragement to use BL because initially they expect face-to-face teaching. A lack of student support for BL can be explained by Ramburuthi and McCormick (2001), who observed that Asian students prefer to work in an organized face-to-face environment, unlike westerners where people are more self-paced. Further, Cheng (1998) stated that Asian students, being more introverted than Western students, tend to not share their ideas with others. Students' attitude to BL could also arise from the cultural emphasis on teacher-centered learning, or perhaps from the study's private HEI context where fees are required and a transactional approach to service could be prevalent.

At the same time, students, particularly those who are hesitant to embrace independence in learning as required in university study, require orientation and transition programs to understand the benefits of BL for their independent learning, inquiry, and problem-solving skills, as well as the critical roles that these cognitive activities play in successful university study. As hallmarks of HE, these skills are acutely relevant for graduates' successful participation in the 21st century world.

CONCLUSION AND RECOMMENDATION

This study of academic staff experiences with online learning technologies in the case of a HEI provides ground-level data in an area where there is little data. While the academic staff in the research used the tools well, there is little evidence of a significant shift in learning techniques or more personalized learning experiences at the HEI, as suggested by the Malaysian Ministry of Education.

The study findings of the forms of BL/online learning tools and reasons for staff using them indicate that there is need for staff to understand BL's potential for learning enhancement in ways that the online learning tools promote skills for the 21st century. This is important as academic staff are at the forefront in designing and implementing BL. HEIs and program directors should instigate PD that widens staff knowledge of tools for students' higher-level skill development and ways to integrate these seamlessly into the curriculum. For example, BL provides virtual spaces through online learning tools that enable students to communicate, interact, discuss, and work collaboratively in solving problems and fostering their creativity, critical thinking, and collaborative skills. Thus, a clear recommendation is that academic staff require systematic PD and "hands on" support in the technical use of BL.

This broad-based study covers the academic staff from all the disciplines of one HEI. However, further studies, such as measuring the amount/percentage of staff and academic programs that incorporate online tools alongside face-to-face teaching, would enable an assessment of the magnitude of the shift to BL in particular subjects and in programs. If undertaken across several institutions, a more general measure of the shift could be ascertained.

Some limitations of this study are that, first, it did not directly investigate if and how staff used BL to meet the learning needs of individual students and of small groups. An open-ended comment section in a survey that address this is required. While a second limitation may be that the study focusses on one HEI, the experiences of academic staff with online tools are rich and provide food for thought and guidance on enhancing online learning in academic programs for the HEI specifically and for HE in general. However, further studies could explore these findings at other HEIs in developing countries and comparing

outcomes would provide a deeper understanding of online tools for enhancing student learning.

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Appendices

APPENDIX 1 FORMS OF BL/TOOLS USED

Form of Blended Learning	*Number of Responses (N)*
Using virtual learning environments	119
Using emails	111
Enabling submission of assignments	100
Using videos in teaching	100
Providing access to resources on other sites or links to other sites	64
Providing announcements and calendar access	58
Social networking for students	55
Engaging students in online discussions	55
Providing access to the module, course, or online teaching materials	53
Providing access to the university library facilities	52
Using the VLE or online tools for marking	23
Providing quizzes or access to online response systems	40
Using plagiarism tools	30
Providing online survey or question session	28
Recording lectures via lecture capture	24
Providing access to simulations or models	22
Using a collaborative classroom (to offer synchronous interactions)	21
Using collaborative tools such as wikis or blogs	18
Using skype or video-enabled tools	14
Using MOOCS	12
Enabling eportfolios to be created	12
Providing podcasts	11
Total	1022

APPENDIX 2: BL TOOLS AND EDUCATIONAL FUNCTIONS

Summary of BL Tool Functions and Academic Staff Usage

Please note that each academic staff could tick more than one of the items presented on the survey, as in Appendix 1 above. Hence the numbers are more than the number of staff who completed the survey.

Function/Category of BL Tools Used	*Number of Academic Staff*
Promoting Management and Efficiency of Educational Program	N=634
Promoting Students' Understanding and Learning	N=227
Supporting Creativity by Promoting Communication and Active Learning	N=164

Category 1 Automating Routine Tasks (Lee & Lim, 2011)

Education function: Promoting Management and Efficiency of Educational Program

Form	*Responses*
Using virtual learning environment	N=119
Using emails	N=111
Enabling submission of assignments	N=100
Providing access to resources on other sites or links to other sites	N=64
Providing announcements and calendar access	N=58
Providing access to the modules, course or program online teaching materials	N=53
Providing access to university library facilities	N=52
Using VLE or online tools for marking	N=23
Recording lectures via lecture capture	N=24
Using plagiarism tools	N=30
Total	N=634

Category 2: Detailed Task (Lee & Lim, 2011)

Educational Function: Promoting Students' Understanding and Learning

Form	*Responses*
Using videos in teaching	N=100
Providing quizzes or access to online response systems	N=40
Providing online survey or question session	N=28
Providing access to simulations or models	N=22
Using Skype or video-enabled tools	N=14
Using MOOCs	N=12
Providing podcasts	N=11
Total	N=227

Category 3: Creative

Educational Function: Supporting Creativity by Promoting Communication and Active Learning

Form of Blended Learning	*Responses*
Social networking for students	N=55
Engaging students in online discussions	N=55
Using a collaborative classroom to offer synchronous interactions	N=21
Using collaborative tools such as wikis/ blogs	N=21
Enabling creation of eportfolios	N=12
Total	N=164

APPENDIX 3

Reasons Respondents are Using BL

Reason/Option	*Responses*
Helps students access information when relevant	N=129
Provides easier resources access	N=102
Enhances understanding	N=91
Supports teaching more	N=78
Provides access to a wider range of resources	N=71
Engages students better	N=70
Helps students manage their learning	N=55
Allows more individual pace	N=50
Provides better visual engagement	N=46
Enables greater skills development in the subject or topic	N=46
Helps generate ideas	N=35
Allows greater reflection on learning	N=40
Supports application of knowledge	N=38
Leads to better comprehension	N=35
Increases reflection and review	N=32
Increases imagination	N=31
Leads to greater self-regulation and self-directed learning	N=29
Enhances conceptualization	N=26
Enables more social and emotional interaction	N=26
Supports peer as well as teacher-led learning	N=24
Offers students a wider range of ways to express themselves	N=22
Enables more trial and error	N=21
Provides better auditory engagement	N=20
Generates greater enquiry and questioning	N=20
Enables more focus on analysis	N=19
Leads to more written output	N=16
Encourages evaluation approaches	N=15
Encourages reasoning and interpretation	N=14
Supports synthesis of ideas and knowledge	N=12
Enables empathetic thinking	N=9
For revision purposes	N=1
Only way students can undertake the training: they are working as this is a postgraduate course	N=1
To show fairness when students are dealing with limited resources	N=0
Total	N=1227

APPENDIX 4

Cronbach's Alpha, Mean, and SD Analysis

Variable	Cronbach alpha	Mean	SD
Replacing Face-to-Face	0.822	3.89	0.64
Online Activities	0.838	3.72	0.78
Sequencing Face-to-Face with online	0.880	3.67	0.86
Out of Class Activities	0.877	3.88	0.89

APPENDIX 5

Mean and SD for Major Reasons: Fit with the Category of Support for Program Management

Variable	Mean	SD
Access study information	3.78	0.74
Easier access to resources	3.56	0.76
Enhancing students understanding	3.57	0.89
Providing more support	3.99	0.91