Blended /Online Learning Tools in an ASEAN Higher Education Institution: Alignment with pedagogy for high-level student learning[[1]](#footnote-1)

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Abstract: Arising from global technological advancements, blended learning (BL) through online learning tools is increasingly used in higher education (HE). Interpreted broadly in this study as online tools integrated with face-to-face teaching, BL tools support programme management and expedite some educational processes like assignment submission. Importantly, BL has the potential to enhance students’ higher cognition skills development through the communication and active learning it supports. Academic staff who design and implement BL programmes and have close contact with students in their learning are key parties in BL implementation. However, there is limited information available on academic staff uses and perspectives on BL (Torrisi-Steele & Drew 2013). This study addresses this gap. It draws on a large-scale quantitative survey and qualitative open-ended question responses of 42.8 percent 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 these, and their impact on their students’ learning. The data collected was analysed by using Cronbach’s alpha to measure the reliability and consistency of the survey items. The findings are that the tools they most used are limited in their support for students’ higher skills development, and are mainly used for efficiency in programme management; the recommendation is that staff professional development (PD) in BL is required. The study adds to the BL literature as it advocates staff technological skills development fused with pedagogical approaches to develop students’ higher cognitive skills. Interestingly in today’s technological world, orientation/transition programmes for students are also required to support BL’s potential for enhanced learning. These study outcomes, while based on a broad spectrum of the academic staff of one HE institution in Malaysia only, do provide information for policy makers and practitioners on BL that enhances student learning and achievement.

Keywords: Blended Learning, Higher Education, Academic Staff, 21st Century Learning Skills, Programme Management

Introduction

Broadly, blended learning (BL) is defined as online tools complementing face-to-face teaching (Alammary et al., 2014). Examples include videos in teaching, electronic assignment submission and marking, and the use of 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, Woodfield, & Harrison, 2013; Holenko & Hoic-Bozic, 2008), it overcomes limitations of stand-alone e-learning and face-to-face learning (Alammary et al., 2014). Studies are available of BL and student learning in higher education (HE) that discuss BL implementation, but there is little on the experiences of one of the key parties in successful BL implementation in higher education (HE): academic staff (Torrisi-Steele & Drew, 2013). This study of a private higher education institution (HEI) in Malaysia is based on survey of a large proportion of the academic staff. It presents a snapshot of their uses and views of BL and also the online tools used at the HEI. Significantly, information such as this provides ground-level and vital information for HE policy-makers and practitioners as they seek to implement best practice BL.

One major finding is that the online tools the staff use most often support efficient programme management, while the tools used less often can increase students’ subject understandings and importantly, support students’ active learning and higher-level cognitive skill development. Through the open-ended survey question, the study finds that staff request professional staff development (PD) in BL to optimize student learning (Halverson, Spring, Huyett, Henrie, & Graham, 2017). This should be more than technical skills training and blend pedagogy with the technical. Importantly, we identify the focus for this pedagogical aspect, which is BL for higher cognitive skill development. This recommendation for BL PD from our study thus adds to knowledge in the field. Further, in maximising BL benefits for learning, staff identify that students also require BL orientation/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) plans for it to account for 70% of programmes by 2025, widening access and enhancing teaching and learning quality. The study discussed in this paper is thus timely, clarifying HEI academic staff’s use of BL tools, the impact of BL on academic programmes and student learning, the challenges posed, and BL’s potential for enhanced student learning.

The research questions addressed in the survey are directed at the HEI’s academic staff, exploring their perceptions on the use of BL in their teaching and the forms of online tools they used (research question 1), why they adopted BL, and what they see as its impact on student learning (research question 2), and open-ended comments on BL. The questions are:

1. What are the forms of BL/online learning tools used in undergraduate programmes at the HEI?

2. Why do academic staff incorporate BL in undergraduate programmes at the HEI?

This paper firstly 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 (Techopedia, 2019) has shaken up education (Chai, 2018) and shifted learning methods (Mozelius, 2013; Raphael & Mtebe, 2016; Fleming, Becker, & Newton, 2017), so that BL permeates HE globally. BL can widen access and enhance HE teaching and learning quality (Ministry of Education, Malaysia, 2015).

***Functions of Digital Tools in BL/Online Learning***

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

***BL 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 teacher-centered, transmission of information  (Biggs & Tang, 1999), determining the functions of BL tools is advantageous. It enables identification of the pedagogical impact of the tools used.

The literature indicates two main functions and advantages of online educational tools: (a) organizational, to improve programme management; (b) pedagogical, to enhance students’ academic performance (De George-Walker & Keeffe, 2010). These functions align with the BL KMS categories above: (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 like a spectrum, ranging from supporting students' understanding, to problem solving and creative thinking.

 Organisationally, 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 greater understanding of subject matter is supported by tools like CDs, animations, audio, and multimedia in traditional face-to-face classroom style (Kazu & Demirkol, 2014). Along the spectrum of student centred active learning, social networking via Facebook, Twitter and LMS support student-teacher communication and collaboration (King, 2016), as do simulated work environments (Schech et al., 2017); both local and international students’ cross-national learning collaboration in real world projects is enabled (Edwards et al., 2002), especially in large undergraduate classes (Chan, 2016). For example, Facebook usage helped students’ active rather than passive learning through peer/ teacher interaction in online discussions (McCarthy, 2010; Kabilan et al., 2010). Subjects with synchronous and asynchronous learning methods provide for student diversity with the best of face-to-face and online worlds (Glazer, 2012). Such interactions induce positive attitudes by allowing students, especially those with diverse backgrounds,  to respond at their own pace, and applies also to millennial students (Green et al., 2012; Zhao et al., 2005).

Involving students in their learning via tools above enhances their academic achievement (Tsai, 2015). Alternatively, merely transferring in didactic-style face-to-face teaching online has limited impact on learning quality (De George-Walker & Keeffe, 2010). The virtual spaces created through relevant tools enable flexibility and through interaction, collaboration and thus exposure to different perspectives on topics and issues, deep learning through critical thinking and joint problem solving (Oakley, 2017, p. 69), within and across their subjects (Biggs & Tang, 1999).

In preparing students for effective 21st century participation where knowledge evolves rapidly requiring new solutions to issues (Crosling, Nair, & Vaithalingam, 2013), BL supports student independence through movement from teacher-centred to student-centred approaches (Crosling, Heagney, & Thomas, 2009), and positions students to identify problems and solutions. This approach may not be fostered in the traditional HE lecture (Lim & Wang, 2016).

***Constructivist Pedagogy and BL/Online Learning***

This study of academic staff BL experiences is underpinned by constructivist pedagogy advanced by theorists Vygotsky, Dewey, and Piaget (Picciano, 2017). Student learning is promoted through student-centred, active and independent study (Prosser & Trigwell, 1999), where staff engage 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 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), fostering flexibility and independence with students accessing their learning online when they wish (Jeffrey et al., 2014; Graham & Robinson, 2007).

***Reasons Why Academic Staff Use BL***

Discussions of BL’s impact on student learning explains why staff use it. BL affects students’ academic performance via the more active study approaches. Studies show that those learning via BL performed better than those without it (Sitzmann et al., 2006; Means et al., 2013; Garrison & Kanuka, 2004). Thomas et al. (2011) 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 BL Implementation***

The literature indicates academic staff’s instrumental role in BL programme design and student uptake (Lim & Wang, 2016).  However, as staff are in the main disciplinary 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 staff’s key BL role, little is known about their experiences with it.  In programme development relevant to learners’ needs, knowledge of the teachers’ backgrounds has long been acknowledged as fundamental (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, so as to implement BL to enhance students’ academic achievement.

Previous studies of BL implementation in HEIs in Malaysia indicate that 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, lack of training and development were major obstacles in implementing BL. Ma’arop and Embi (2016) were more detailed about the needs for successful BL implementation, with staff technical and pedagogical development required. However, they did not specify further, for example, on 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 to given tasks, but again did not elaborate further on how this may relate to student-centred active learning.

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

Research Questions and Methodology

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

The Survey Instrument

The survey instrument was developed to address the research questions presented earlier in this paper about academic staff and BL in undergraduate degrees at the case HEI. It is not compulsory at the HEI for staff to include BL in the teaching programme, however they are encouraged to do so. One rationale for this encouragement was that BL provides students with another channel for their study and for the expression of their understandings. 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 (2014) on technologies to support teaching, learning and excellence, farmed by the United Kingdom’s Teaching Excellence Framework; (2) the learning elements framework (Passey, 2014) of digital technologies for differing learner’s competencies, challenges, and student interactions.

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

RQ 1: Survey Question ‘What forms of BL (ie, the online learning tools) do you use in your programme or subject?’

RQ 2: Survey Question ‘How do you use these specific forms/tools in your programme or subject?’, and ‘What is the impact of the BL on student learning in your programme or subject?’.

For these questions, respondents were presented with a list of items related to the question (Appendix 1 lists the survey items). Respondents were asked to indicate with a ‘tick’ (√) those from the list of items that applied to them. Staff could ‘tick’ as many of the items on the lists 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 and learning, academic programme or subject.

Data Analysis

Microsoft Office Excel was used to organise 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, as well as reasons for using BL. Charts were also generated through the statistical software to illustrate how respondents used BL for teaching their subjects and how its use has impacted their subjects.

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

The educational functions of the forms/tools used were assessed through application of Lee and Lim’s (2011) KMS functions aligned to education for the digital tools/ items listed on the survey. Reiterating, these categories are : (1) ‘automating routine function’; (2) ‘enabling detailing of tasks’; (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 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 compared with the others.

For the respondent comments in the survey open-ended question, content analysis was used to establish themes across the comments. Manual coding method was done for extracting important themes from the qualitative data, particularly in relation to respondents’ perceptions about the benefits and issues of BL usage in their subjects. Table 1 provides the themes 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 provided for all the HEI’s undergraduate programme academic staff. The overall pool of possible respondents, that is, the academic staff, were informed of the study and the survey promoted electronically and by word-of-mouth through schools and departments. Respondents self-selected to complete the survey. Data were collected over two months mid-2017. The results for the study were gained from the completed survey forms of 142 academic staff (42.77% of the case 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 case HEI’s academic undergraduate sections.

The survey covered the demographic profile of respondents and items to measure the constructs. A pre-testing of the questionnaire was completed with 20 selected academics who had experience with BL. The question structures were thus refined on the survey instrument. The self-administered survey was used to gather data. The reliability of the measures was assessed 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 item were deleted. An example of the statistical processes completed on the data is seen in Appendix 5 on ways that staff use BL in their subjects.

Results

BL Forms/Tools Used

For RQ 1, the findings are that the most used digital forms/tools fit with the function category for programme management. 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 is the Learning Management System (LMS) (N=119), followed by email usage (N=111). Also highly rated are BL for assignment submission (N=100), access to resources on other sites (N=64) announcements and calendar access (N=53). These promote efficiency but not necessarily enhanced learning through higher level cognition. Interestingly with the advent worldwide of social networking, the survey items in category (3) of the BL KMS, students’ social networking and engaging students in online discussion together accounted for only N= 110.

The next most used set of tools at the HEI enhance teaching and learning via additional and multimedia forms (Appendix 2), so students better understand subject content and check understandings: Using videos in teaching’(N=100); 'Providing quizzes or access to online response systems' (N= 40), 'Providing online survey or question session’ (N=28). The survey comment testifies 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, as developed through communication and active learning: ‘enabling the creation of e-portfolios had 12 responses; (N=12), ‘using Skype or video-enabling tools’ (N=14), and ‘using collaborative tools such as wikis and blogs;, N=21. These tools that facilitate student and teacher communication, active learning and critical analysis and problem solving skills (Oakley, 2017), 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:

*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 relevant 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 BL used in respondents’ subjects

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' subjects

The reliability values were all above the 0.7 value as suggested by Nunnally (1978), so we can conclude that the variables were reliable measures.

On the surface, the most cited use, the replacement of some face-to-face teaching with BL, indicates BL integrated in the academic programmes of many respondents as seen in the respondent comment:

*It is an effective tool for large classes.*

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

*I don’t feel any reward or recognition to spend too much time focussing on upgrading.*

The next most popular ways BL was used are ‘providing additional online activities; (N=68), and ‘out of class activities’ (N=37), are promising and suggest staff integrating BL into the programme, rather than 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 contrasting with face-to-face and BL tools complementing each other to achieve the subject’s learning outcomes. Despite this, there is recognition of the need for a systematic approach as in the respondent comment:

*The implementation of blended learning should be well planned ahead in order to ensure effectiveness and coherence.*

An optimistic view of BL from the survey comments is:

*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 for Staff Use of BL

For RQ 2 on why academic staff use BL, Appendix 3 shows the major reasons fit the category of support for programme management: ‘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 are: ‘for study revision purposes’ (N=0), ‘enabling more empathetic thinking’ (N=0). (Appendix 3). The mean values ranged from 3.78 for subjective norm to 3.99 with standard deviation values of 0.74-0.91, further detail of the analysis can be found in Appendix 5.

However, some of the least supported reasons assist students’ active learning, underpinning higher level cognition/21st century skills development. Requiring critical thinking and leading to problem solutions, these functions are: ‘supporting synthesis of ideas and knowledge’ (N=12), ‘encouraging reasoning and interpretation’ (N=14), ‘encouraging evaluation approaches’ and ‘leading to more written output’ (N=15,and 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 exploration of staff views on BL’s impact on their subjects. Staff acknowledge BL’s benefits for student learning: as in Figure 2 below, ‘greater student engagement’ is perceived by the highest number of staff as the impact (N=107). Staff indicate they use BL mostly so students can ‘access relevant information and resources’ (Figure 2 below). 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’ at only 39 responses (N= 38), indicating that the programme’s management is the main purpose. The respondents’ specific interpretation of student engagement is not identified, but generally it is seen as motivated and participatory 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 subject

Academic staff comments on BL

The open-ended survey comments provide interesting staff perceptions on issues related to their use of BL across the study’s research questions. The comments received indicate that staff appreciate BL’s benefits, but are ambivalent and express the need for PD blending pedagogical understandings about active learning with the technical skills for programme management. Staff also indicate students’ reluctance to incorporate BL in their study.

From the total of 71 comments in the survey open-ended comment question, the themes established through content analysis and the number of comments per theme are indicated in Table 1 below.

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 that they appreciate its benefits for their learning | N=18 |
| Staff do not like BL | N=5 |
| Students don’t want to use BL | N=2 |
| Student don’t understand how to use BL | N=2 |
| *Total* | N=71 |

Respondents perceived BL as beneficial in teaching and learning enhancement (N=25). The next theme (N=19) is that staff require more training to operate with BL:

*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 it (N=2).

Discussion

The tools most often used by the academic staff in their teaching at the HEI is for programme management purposes. We perceive that efficiently-managed programmes facilitated by BL tools do benefit students in that they avoid confusion that can lead to students’ disengagement from their studies. For instance, efficient access to resources and assignment submission 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 their learning engagement. However, the tools for the function of learning enhancement are less often used at the HEI.

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

Emphasis on management tools could also occur because BL is a relatively new educational approach, and staff are coming to terms with its attributes and methods. At this stage, perhaps they prefer tools they can master readily and through which they can see managerial impact on the programme, rather than those such as evaluative and analytical thinking that impact on 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 such use needs to be consolidated and extended broadly in the HEI. The study finds that staff perceive BL’s impact on their subjects as learning and teaching enhancement. However, the tools they mostly use support programme 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 for skills with technical skills development.

Academic staff appreciate how BL can enhance their programmes, but their survey comments indicate that they do not feel ready to do so because of lack of time and 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 it 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 evident in survey comments, the staff believe they require more training/PD in BL. This supports views (Garrison & Vaughan, 2008; Thomas et al., 2017) that PD is required. Lack of PD and support is a significant barrier to best practice BL implementation (Mitchell & Forer, 2012). Although not outlining the specific elements of suitable PD, Salter (2006) states that it should be based on sound pedagogy for BL curriculum design and implementation, and guidance in innovative, interactive approaches. This means that BL tools do not only repeat existing practice in an online environment. As a key contribution of this study arising from exploration of the tools used, it is seen that BL for students’ cognitive skills development is relatively weak at the HEI. This study thus further clarifies and provides details of the type of PD required, elaborating on Salter’s (2006) comment above.

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

At the same time, students, particularly those who are hesitant to embrace independence in learning as required in university study, require orientation and transition programmes 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. While the academic staff in the research use the tools well, there is little evidence of a significant shift in learning techniques or more personalised 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 BL 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 21st century. This is important as academic staff are at the forefront in designing and implementing BL. HEIs and programme 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’s provision of virtual spaces through online learning tools enables students to communicate and interact, discuss and work collaboratively in solving problems, fostering their creativity, critical thinking and collaborative skills. Thus, a clear recommendation is that academic staff require systematic PD and ‘on hand’ support in the technical use of BL, as explained above.

The 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 programmes that incorporate online tools alongside face-to-face teaching would enable assessment of the magnitude of the shift to BL in particular subjects and in programmes. If undertaken across several institutions, a more general measure of 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 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. They provide food for thought and guidance on enhancing online learning enhancement in academic programmes for the HEI specifically and for HE in general. However, further studies could explore these findings in other HEIs in developing countries and comparison of outcomes would provide 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 e-portfolios to be created | 12 |
| Providing podcasts | 11 |
| *Total* | 1022 |

**Appendix 2: BL Tools and Educational Functions**

1. **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*  |
| 1. Promoting Management and Efficiency of Educational Programme
 | N=634 |
| 1. Promoting Students’ Understanding and Learning
 | N=227 |
| 1. Supporting Creativity by Promoting Communication and Active Learning
 | N=164 |

1. **Category 1 (Lee and Lim, 2011) Automating Routine Tasks.**

**Education function: Promoting Management and Efficiency of Educational Programme.**

|  |  |
| --- | --- |
| *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 programme 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 |

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

**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  |

1. **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 e portfolios  | N=12 |
| *Total* | N=164  |

**Appendix 3**

**Reasons Respondents 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 conceptualisation | 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 Programme**

**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 |

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