Is blending the solution? A systematic literature review on the key drivers of blended learning in higher education

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ABSTRACT   *Higher education institutions have been increasingly adopting blended learning as a course delivery mode in the recent years. This article reports a systematic review of the current literature on the advantages of blended learning. Starting from 855 papers, ten articles met the predefined inclusion criteria for the literature synthesis. The papers were screened and analysed through three screening phases. Major themes focused on the advantages of blended learning were drawn from the final ten papers and include a) increasing students' academic performance, b) increasing students' social abilities, c) decreasing course drop-out rates, d) increasing students' satisfaction and, e) increasing teaching and learning flexibility. The results also indicate that different higher education institutions adopt blended learning approach for different reasons. Implications of this review and future research directions are proposed.*

KEYWORDS   *Blended learning, higher education, flexible learning*

Blended learning has been described as an innovative and promising modality of course delivery in various higher education contexts (e.g., Deschacht & Goeman, 2015; Jesus, Gomes, & Cruz, 2017; Olelewe & Agomuo, 2016; Vernadakis, Antoniou, Giannousi, Zetou, & Kioumourtzoglou, 2011). In fact, in the recent years, it has been considered as part of mainstream higher education across the disciplines and some scholars believe that blended learning is the new norm (Graham, Woodfield, & Harrison, 2013; Hoic-Bozic, Dlab, & Mornar, 2016; Masi & Winer, 2005). With emerging advanced information and communication technologies, higher education institutions have been adopting the course delivery mode to reach diverse learners (McKenzie et al., 2013; Zhu, Au, & Yates, 2016), facilitate learning (Alonso, Manrique, Martinez, & Vines, 2011; Demirer & Sahin, 2013) and to generally add value to learning environment (Alammary, Sheard, & Carbone, 2014).

Blended learning, sometimes referred to as hybrid learning, is being described in various context using different terminologies. According to Alammary et al. (2014), blended learning is thoughtfully integrating various instructional methods which consists of face-to-face and computer mediated learning. Allen and Seaman (2007) assert that blended courses are which deliver through online and face-to-face mode. Lalima and Dangwal (2017) believe that, it is a teaching and learning methodology, which includes traditional face-to-face teaching and teaching supported by information and communication technologies (ICT). Graham et al. (2013) have a similar view describing it as "a combination of traditional face-to-face and technology-mediated instruction" (p. 4). Despite the slight differences in the given definitions, two common components are included in all the definitions, which are "face-to-face" learning and "online" learning. Hence, for the present review, blended learning is defined as learning that consists of conventional face-

to-face teaching and technology-mediated learning.

Blended learning provides a range of teaching and learning choices to teachers and learners and a richer learning experience overall, which allows learners to get engaged in productive learning activities across subject disciplines (Hoic-Bozic et al., 2016; Jesus et al., 2017; López-Pérez, Pérez-López, & Rodríguez-Ariza, 2011; Mitchell & Forer, 2010; Zhu et al., 2016). The current literature indicates that the flexible nature of blended learning is one of the attractive aspects of the modality for many students, especially for mature learners (Boelens, Voet, & De Wever, 2018; Broadbent, 2017). Boelens et al. (2018) believe that blended learning provides flexibility to students beyond time and space of learning. This allows isolated learners to overcome learning barriers such as time and space and enable mature learners who are busy with family and employment commitments to pursue higher education and carry on lifelong learning. It also helps teachers to cater individual students' needs by providing them personalised learning (Boelens et al., 2018).

Broadbent (2017) believes that blended learning helps students develop their self-regulated learning abilities. Ting and Chao (2013) assert that students' self-regulated behaviour includes controlling learning time and environment, control of learning resources and seeking help from peers and teachers. If students' self-regulation behaviour works well, it empowers students and helps them to change their behaviour (Ting & Chao, 2013). Zhu et al. (2016) affirm that students with self-controlled and self-regulated abilities perform better in higher education and that blended learning develops students' self-regulation skills. Yamada et al. (2016) found that self-regulated learning has a significant effect on the students' awareness of their learning procrastination factors. In addition, Broadbent (2017) found that blended learners applied more self-regulated learning techniques, which indicates that they managed their studies more effectively resulting in better scores in the final exams when compared to their face-to-face counterparts. This finding is in line with Pardo, Han, and Ellis (2017), Zhu et al. (2016) and Van Laer and Elen (2017), who emphasised that blended learning promotes self-regulated learning which enables students to gain more comprehensive understanding in the subject knowledge and carry on more successful university learning.

Blended learning underpins principles of learning theories such as constructivism (Poelmans & Wessa, 2015; Vernadakis et al., 2011) and social-constructivism (Clarke, 2012; Varthis & Anderson, 2018; Wen, Zaid, & Harun, 2016). Wen et al. (2016) found that social interactions between peers, students and teachers in blended learning creates a social constructivist learning environment where various cognitive constructivist principles are applied due to the nature of collaborative methods of blended learning activities (Varthis & Anderson, 2018).

Despite the current literature indicates that blended learning is a successful approach for course delivery, and higher education institutions have been increasingly adopting the approach, studies explicitly highlighting advantages of applying blended learning in various higher education contexts are limited. The present review of literature thus synthesises the current literature aiming to identify the key advantages of blended learning, with a focus on the following research questions; a) How successful is blended learning in various higher education contexts? and b) What aspects of blended learning attract higher education providers to adopt the modality?

Methods

Eligibility criteria and search strategy

For this review, papers were restricted to the last decade hence literature being published between 2008 and 2018 were screened. The below inclusion criteria were applied for the review.

a. The paper was focused on higher education

b. The study was about the strengths of blended learning (which includes case studies, investigations, perceptions and experiences)

c. The study was published in a peer-reviewed journal

d. The article clearly describes the research process

e. The article was written in English

In addition to the aforementioned inclusion criteria, a few other points were taken into consideration during the screening process as exclusion criteria. These include, excluding research summary reports, systematic reviews and meta-analysis, papers that discuss fully online courses, effectiveness of general ICT tools and papers that describe/investigate aspects other than effectiveness of blended learning. Only peer-reviewed articles were considered to ensure some rigor of the research process of the selected studies. The papers, which describe a clear research process also helped the reviewer to select methodologically sound papers for this review, and to understand general methodological approaches are being applied in this field, as well as to identify limitations of the selected studies.

The literature search for this systematic review was conducted through three electronic databases namely ERIC, Science Direct and ProQuest. For the keywords, E-Learning, online learning, ICT in education, technology in teaching and learning, blended learn★ [OR] blended instructions, hybrid learning, hybrid instructions, higher education [OR] postsecondary education and tertiary education. These search terms were selected based on the researcher's knowledge of the field. The search was performed during the first week of April 2018.

From the mentioned literature search, a total 852 articles; 636 from ERIC, 84 from Science Direct and 132 from ProQuest were retrieved. In addition, three studies were identified from other sources which makes the total papers as 855. For the initial screening, titles and abstracts of all the 855 articles were screened and assessed against the inclusion and exclusion criteria; and 803 articles were rejected at the title and abstract screening stage. Majority of these papers were rejected because they were either about general ICT tools or not focusing on higher education. After this phase of screening, 52 papers were shortlisted for the phase two screening. In this stage, 29 papers were excluded to eliminate duplicates, and to exclude papers, which examines blended learning but not strengths of the modality. This process made the number as 23 for critical appraisal.

Critical appraisal

All the 23 studies identified as eligible were appraised for the methodological rigor and quality of the study. As the present review involves a single author, all the 23 studies were screened three times to minimize potential selection errors and biases. In this phase, all the studies were read with care to ensure the appropriateness of the study to the present review and quality of the studies against the predefined inclusion criteria. Particularly, methodology sections of all the 23 study were screened to eliminate the possible study bias risks and select methodologically sound studies for this review. Based on this screening, ten papers were identified as suitable for the present review. For the quality appraisal, Pati and Lorusso (2018) guidelines were used to determine quality of the studies. Figure 1 shows the outcome of the selection process.
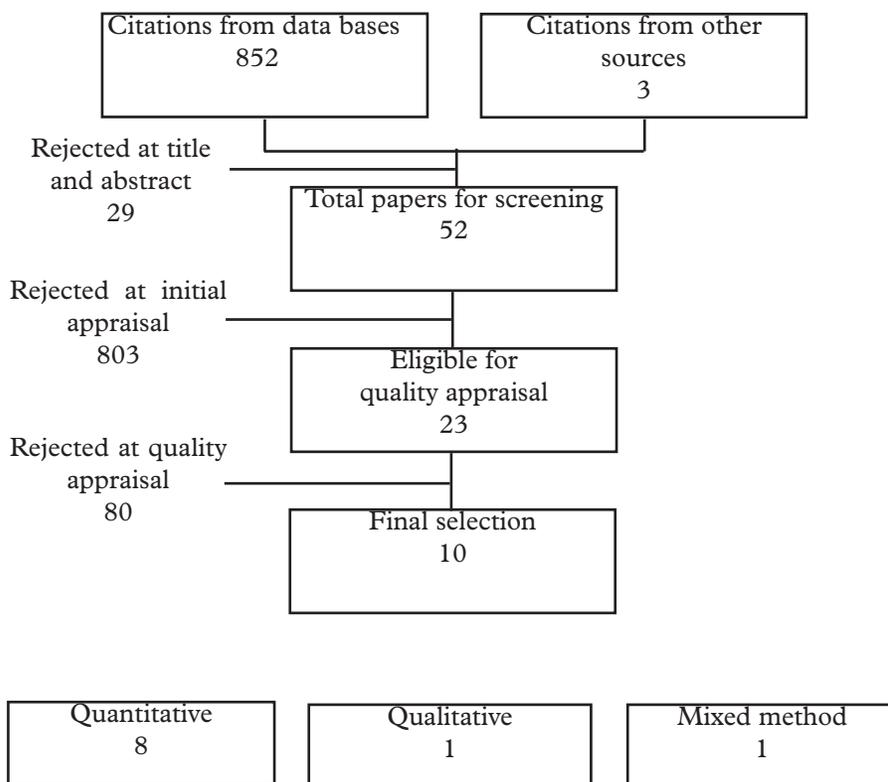

Figure 1. The selection process and the outcome

Data Analysis and Synthesis

To analyse the data, important information of the ten papers ten papers were extracted which include authors, published year, country, sample size, subject discipline, research design method, aim of the study and the key findings. Table 1 explains summary of the analysed papers.

Table 1
Summary of the analysed papers

Author(s) & Year	Country	Participants & study level	Subject area	Design method	Aim(s) of study	Key findings
Al Zumor et al. (2013)	Saudi Arabia	160 Undergraduate	English language	Quantitative	Studying EFL students perception on advantages & challenges of blended learning (BL)	1. Students were positively influenced by BL in learning Eng. Language skills were improved 2. More useful feedback and more opportunities to communicate with peers and lecturers 3. Develops students' meta-cognitive, affective, and social abilities.
Alonso et al. (2011)	Spain	693 Undergraduate	Engineering	Quantitative	To examine the effectiveness of a newly developed BL course for computer course in an undergraduate engineering prog.	1. BL students achieved better score than face-to-face (f2f) 2. Reduced the course dropout rates
Deschacht and Goeman (2015)	Belgium	1883 Undergraduate	Business	Quantitative	To study students' course persistence and performance	1. BL improves course results (a positive effect on performance) 2. BL increased course drop-out rate (a negative effect)
Jesus et al. (2017)	Portugal	110 Undergraduate	Pharmacy	Quantitative	To study f2f and blended students' performance in a therapeutic course	1. BL students performed better than f2f students

Author(s) & Year	Country	Participants & study level	Subject area	Design method	Aim(s) of study	Key findings
López-Pérez et al. (2011)	Spain	4131 Undergraduate	Accounting	Quantitative	To study the effect of BL on student learning out-comes	1. Students were positively influenced by BL in learning Eng. Language skills were improved 2. More useful feedback and more opportunities to communicate with peers and lecturers 3. Develops students' meta-cognitive, affective, and social abilities
Olelewe and Agomuo (2016)	Nigeria	148 Undergraduate	Computing	Quantitative	To study the effectiveness of a blended learning QBASIC programming lan-guage course	1. BL reduced student dropout rate and increased retention
Poon (2013)	UK	269 Undergraduate & postgraduate	Various subjects	Qualitative	To examine the benefits that blended learning pro-vides to HE	1. The study shows BL model was more effective than the traditional f2f
Potter (2015)	Spain	100 Undergraduate	Management	Quantitative	2. It gives flexibility to both teachers and learners	1. It' an effective approach to reach distant learners 2. It gives flexibility to both teachers and learners 3. BL enhances students' learning experiences

Author(s) & Year	Country	Participants & study level	Subject area	Design method	Aim(s) of study	Key findings
Vernadakis et al. (2011)	Greece	172 Undergraduate	Computer studies	Mixed methods	To examine the effectiveness of a BL course comparing with a f2f computer studies course	1. Hybrid learning students had higher scores than f2f students 2. Hybrid learning supports constructivist view of learning
Woltering et al. (2009)	Germany	185 Undergraduate	Medicine	Quantitative	To study whether problem-based blended learning increases the students' motivation and supports the learning process	1. BL students were more satisfied and motivated than f2f 2. No significant difference was found in the test results of BL and f2f

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Results

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The results of the present review indicate that blended learning provides several advantages for students, teachers and the higher education institutions. The main themes emerged from the reviewed literature are summarised in the Table 2.

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Table 2

Summary of emerging themes of the reviewed papers

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Emerging themes	Description
Increased student performance Al Zumor, Al Refaai, Eddin, and Al-Rahman (2013) Alonso et al. (2011) Deschacht and Goeman (2015) Jesus et al. (2017) López-Pérez et al. (2011) Olelewe and Agomuo (2016) Poon (2013) Vernadakis et al. (2011)	Blended learning increased student performance and/or students performed better than their face-to-face counterparts in various subject disciplines such as English language, computer studies, business studies, accounting, management and some other subjects in area of social science.
Increased students' social abilities Al Zumor et al. (2013) Poon (2013) Vernadakis et al. (2011)	Multiple mode of communications provided by blended learning between students and teachers develop students' communication skills and social abilities which enable learners to get more engaged in learning
Decreased student drop-out rates López-Pérez et al. (2011) Alonso et al. (2011)	Blended learning reduces dropout rates due to its learner support mechanisms
Increased student satisfaction López-Pérez et al. (2011) Woltering, Spitzer, Spreckelsen, and Herrler (2009)	Students were more satisfied with learning experiences provided by blended learning
Increased teaching and learning flexibility Poon (2013) Alonso et al. (2011)	Students and teachers get more flexibilities in terms of class hours, learning activities and learning approaches.

As Table 2 indicates, blended learning increased students' academic performance in various subject areas. It was evident that in some cases students' performance were significantly increased (Potter, 2015; Vernadakis et al., 2011). More specifically, in other instances, blended learning courses were more effective and students performed better than face-to-face students (Jesus et al., 2017; Olelewe & Agomuo, 2016). In addition, it was clear that blended learning had a positive impact on reducing student drop-out rates and increased student retention (Alonso et al., 2011; López-Pérez et al., 2011), which can be seen as a potential advantage from higher education organisational perspective. Further, the results of the present review revealed that blended learning engages learners with active

learning and students were more satisfied with their blended learning experiences (López-Pérez et al., 2011; Woltering et al., 2009). Lastly, blended learning provided flexibilities to both learners and teachers (Alonso et al., 2011; Poon, 2013). It, also provided various avenues for learners to communicate and interact with each other, which positively impacted their cognitive, communicative and social competencies (Al Zumor et al., 2013; Poon, 2013; Vernadakis et al., 2011).

Discussion

This systematic review of the literature indicates that blended learning supports effective learning and helps students to perform well in various subject areas, which include language, business studies, information science, accounting and management. This finding suggests that blended learning has potential to provide enriched learning environments in different subject areas where students can learn knowledge and transfer their learning through multiple types of learning activities. This finding is in line with Smith and Suzuki (2015), where blended learning helped students learn mathematics better than face to face teaching, and Al-Qahtani and Higgins (2013) in which students performed very well with blended learning in the study of Islamic culture subject. In addition, Chen, Breslow, and DeBoer (2018) states that undergraduate physics course had better blended learning experience. In a study conducted by Manwaring, Larsen, Graham, Henrie, and Halverson (2017), blended learning students were found more cognitively engaging with the content.

As mentioned by Al Zumor et al. (2013), Poon (2013) and Vernadakis et al. (2011), blended learning increases students' social abilities as it provides multiple tools and avenues to interact with peers and teachers. The nature of learning allows students to clarify, elaborate their ideas, contribute and actively engage in learning activities via the online learning platform, which enhances their social and communication skills. It is evident that students' language and communication skills were enhanced through blended learning as mentioned by Guangying (2014), Obari and Lambacher (2012) and Sonia Rodríguez, Calixto Gutiérrez, and Honorio Salmerón (2010); indicating that blended learning has potential of enhancing students' communication skills and social abilities.

Another theme emerged from the present review was how the blended learning reduces student dropout rates and increases student retention. In some cases, before introducing blended learning, student dropout rates were substantially high but after the blended learning was implemented it decreased remarkably. López-Pérez et al. (2011) and Alonso et al. (2011) believe that student dropout rates are reduced in blended learning as it provided a systematic learner support mechanism for the students throughout their course of their study. This support mechanism consists of providing prompt and immediate feedback to students via the online learning management system, which helps them to feel independent in their learning (Hamad, 2017) and to know their progress in learning and identify the areas to work harder (Chen, Breslow, & DeBoer, 2018).

In addition, as blended learning typically provides a range of learning activities using various technological tools, this helps teachers providing customised learning to individual learners as per their learning styles. This argument is in line with Broadbent (2017) and Boelens et al. (2018) which highlighted how blended learning caters individual learners' learning needs to achieve learning outcomes.

Finally, as part of the support mechanism, blended learning provides a convenient communication channel for the students to interact with their peers and teachers (Cheng & Chau, 2016; Diep, Zhu, Struyven, & Blieck, 2017; Manwaring, Larsen, Graham, Henrie, & Halverson, 2017) This enable learners to seek help via the learning management system as need arise, even if they are physically separated. Furthermore, student satisfaction in blended learning was an important aspect for their learning achievements. In many instances, such as López-Pérez et al. (2011) and Woltering et al. (2009) blended students were more satisfied with their learning experience than their face-to-face counterparts. This indicates that there is a chance of achieving higher learning outcomes by blended learners as students' positive attitudes and satisfaction increases their productivity in learning, which leads to have students sense of learning engagement and attain better learning outcomes (Owston, York, & Murtha, 2013). This supports research findings of Zhang, Dang, and Amer (2016), López-Pérez et al. (2011) and Cheng and Chau (2016) where students' satisfaction and their academic achievements were significantly correlated.

Finally, flexibility is another aspect that blended learning provides to the students and teachers. Alonso et al. (2011) and Poon (2013) believe that blended learning provides flexibility to teachers in selecting content, learning activities and tools, which best suit their learners' needs while students get flexibility to learn at their own pace at their convenient time and place. The idea of flexibility supports the current literature as mentioned by Potter (2015) and Alonso et al. (2011) and enable learners to carry out their learning endeavours whilst also maintaining their family and employment commitments. It also eliminates disadvantages of being isolated with time and distance (Asarta & Schmidt, 2015). This nature of flexibility can be an advantage for the institutions to use resources such as teaching facilities more efficiently and cost effectively with higher student population as blended learners typically do not attend on campus every day. For all these reasons, as discussed, the current body of knowledge indicates that blended learning is advantageous and has several aspects that act as drivers of the modality which can be used as a smart tool to provide effective higher education.

Conclusion and implications

The present systematic review which involves 7851 participants indicate that blended learning is an effective mode of course delivery in higher education which successfully enhance students' learning experience in various subject disciplines. The review highlights that blended learning students perform better than face-to-face and online learners, it reduces course drop rates and increase retention. It also provides flexibility to leaners, teachers and organisations. As discussed earlier, it increases students' satisfaction in their learning experience which makes learners more involved in the learning process. Finally, blended learning helps students become effective communicators and it develops students' communication and social skills through use of various communication channels.

These results suggest that higher education institutions should consider adopting blended learning approaches and incorporate in their course delivery to take advantage of contemporary technological tools. However, for the successful

blended learning implementation, institutions need to have clear goals towards blended learning, proper planning for its implementation and establish required resources and technological infrastructure. The findings of this review also would help researchers and practitioners to investigate the highlighted benefits, aspects of blended learning in a more diverse and larger populations to understand how blended learning enhances different aspects of learning. Further studies are needed, focusing on the effect size of blended learning approach in various subject disciplines and learning contexts.

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