Factors to Consider for Implementing Blended Learning in Saudi Higher Education

Institutions: An Integrative Literature Review

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Abstract

Blended/hybrid learning, a combination of face to face and online learning to deliver instruction, is growing in popularity at institutions of higher education, and may lead to many benefits for students, faculty, and administrators. However, the implementation of blended learning (BL) is a complex process. Although the move towards BL adoption is generally accepted by faculty, questions still remain when it comes to adopting and implementing standards across institutions. Given this problem, this integrative literature review was conducted to identify possible factors that impact the process of implementing BL smoothly and successfully at higher education institutions. The purpose of this study was to identify related institutional factors from empirical studies published from 2000 to 2020. Findings from this study may offer institutions a guide to effectively create, execute, and assess BL programs and courses. The study provides recommendations that may be impactful for decision-makers at Saudi higher education institutions.

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General Audience Abstract

Blended/hybrid learning, a combination of face to face and online learning to deliver instruction, has become popular at universities because it provides advantages for students, faculty members, and the university itself. However, the implementation of blended learning (BL) is a challenging process, and in many instances there is not enough guidance available to assist universities through the process. For this reason, this study has been conducted with the goal of identifying possible factors relating to implementing BL smoothly and successfully at universities. Findings from this study may offer institutions a guide to effectively create, execute, and assess BL programs and courses. The study provides recommendations that may be impactful for decision-makers at Saudi universities

Dedication

To my Father, Masoud Alsobhi, and my Mother, Badrya Alsobhi,

To my Siblings, Thamer, Sultan, Sattam, and Abduallah,

I dedicate this dissertation.

Without your constant support and unconditional love, none of this would have

happened.

All I want now is to be the daughter and the sister who makes you as proud as you have

always made me.

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Chapter One: Introduction

This chapter concentrates on providing an overview of the main components of the dissertation. It starts with a brief background concerning the outcome of implementing information and communication technology (ICT) at the higher education level, and how it has led to the appearance of blended learning (BL). More specifically, King Abdulaziz University (KAU) in the Kingdom of Saudi Arabia (KSA) will be used as the context. In addition, this chapter discusses the need for the current study and its purpose. It also highlights the main research questions to be answered, and why this study is beneficial. Following this will be an outline of how the remaining chapters are organized.

Background

In the early 21st century, the rise of ICT has contributed to the evolution of technology-enhanced learning, where technologies facilitate exchange and spread knowledge beyond the boundaries of traditional classrooms (Al-Hassan & Shukri, 2017). This technology provides multiple innovative methods for delivering learning content, and establishes continuous learning opportunities (Baragash, & Al-Samarraie, 2018; Tseng & Walsh Jr, 2016).

Institutions of higher education strive to gain benefits for themselves and students without expanding campus space. One way that they do this is by identifying innovative solutions such as blended and online learning (Previtali & Scarozza, 2019). These solutions are associated with greater flexibility, lower costs, or time-savings (Milad, 2019; Stein & Graham, 2020). In other words, institutions are attempting to find "flexible" delivery methods to increase student access to learning, while also meeting institutional needs "for efficiency and accountability" (George‑Walker & Keeffe, 2010; Adekola et al., 2017). This approach is less about the eradication of campus-based programs, and more about how to utilize both face-to-face

and online learning in an effective mix for the purposes of higher education (Kastner, 2019).

Most of these institutions are combining e-learning components into their conventional courses

to either offer degrees online, or enhance the delivery of traditional courses (Ahmed, 2010).

The promising trend of pairing onsite (i.e. face-to-face) with outside (i.e. online)

classroom experiences is known as blended learning (BL) (Stein & Graham, 2020). Blended

learning and/or hybrid learning are terms which refer to the same concept, that is, mixed-modes

or multi-models of delivery, usually face-to-face and online (Abdelrahman, & Irby, 2016; Jerke

& Mosterd, 2017; Marunić & Glažar, 2015; O'Byrne & Pytash, 2015). The main objectives of the

BL approaches are up-and-coming developments in ICT (Garrison & Vaughan, 2013). BL is used

across diverse disciplines to capitalize upon technologies for increasing accessibility and

flexibility (Green & Whitburn, 2016; Shebansky, 2018). The adoption of blended learning as a

delivery mode has been gaining momentum in higher education institutions in many countries

around the world (Barry & Alhazmi, 2018; Graham et al., 2013; Kastner, 2019).

Researchers predict BL will become "a new traditional model" (Graham, 2006), "a new

normal" (Norberg et al., 2011), or "a dangerous idea" that bridges the old and the new in course

delivery (Moskal et al., 2013). However, others predict BL will be "a hydra-headed monster:"

difficult to train and subject to multi-faceted interpretations if the essential priorities have not

been taken into a consideration (Niemiec & Otte, 2010). In fact, BL has become a "buzzword"

that is implemented not only in higher education settings, but also in industry, K-12 schools

(Halverson et al., 2017), the military, and many other settings (Dziuban et al., 2018; Wentao et

al., 2016).

In KSA, like its counterparts, BL is a growing trend (Aldosemani et al., 2019). The

Ministry of Education (MoE) in KSA participates in this trend along with other institutions by

integrating traditional lecture and online delivery in the classrooms (Kashghari & Asseel, 2014). As a part of the ministry's ongoing effort to improve the flexibility of learning and accessibility to education, it established the National eLearning Center (NeLC) in 2006 (NeLC, 2019). The center aims to improve traditional classrooms by increasing educational accessibility and integrating educational systems that utilize modern technologies (Almoslamani, 2018).

King Abdulaziz University (KAU) is a pioneer in enhancing student experiences (in particular female students) through the use of e-learning. It was also the first university that simultaneously accepted male and female students for enrollment in online classes (Aljaber, 2018). The Deanship of Distance Learning's (DDL) mission in KAU is to provide, "varied and outstanding educational services through the effective and efficient implementation of modern technologies in e-learning and distance education based on national and international quality standards" (DDL, 2016a). DDL has future plans to provide blended learning as a delivery mode. According to DDL, currently student and faculty readiness for BL has been under study (DDL, 2016b).

Even though many institutions are undergoing BL transformations that may entail course level discussion, there is often no systematic review across the institution. Alebaikan (2010) stated that there is ambiguity regarding BL as a delivery medium, particularly in Saudi Arabia. Despite MoE support for BL, there are issues in implementing it (Aldosemani et al., 2019). In fact, the process of adopting BL is not as simple as mixing traditional and online classes every now and then (Lin, 2009). Transitioning from a traditional face-to-face delivery mode to a blended delivery mode is often extremely complex task may come with major issues which must be considered before and during the implementation of new curricula and techniques (Lotrecchiano et al., 2013).

Graham et al., (2013) stated that, "many institutions of higher education that are in the awareness/exploration stage would like to transition to adoption/early implementation" (p. 11). However, institutions should have a shared vision and energy for a successful and strategic transition to BL (Taylor & Newton, 2013). Maximizing the success of BL implementation requires a well-defined approach that includes a model based on learning theory, trained faculty, student support, course assistance, and ongoing assessment that is both formative and summative (Dziuban et al., 2004). According to Garrison and Vaughn (2013), if institutions want to harness the power of a BL initiative, they need to transition to BL by demanding organizational planning, strong leadership, and sustained commitment.

To gain a better understanding of how to support the implementation of BL as a new educational technology innovation, two models need to be considered: Rogers's Diffusion of Innovation (DoI) and Ely's Eight Conditions for Technological Change. Rogers' Diffusion of Innovations (2003) is a crucial framework in the domain of adopting innovation to explain the adoption process by individuals and organizations over time. Ely's Eight Conditions for Technological Change (1990, 1999) is a crucial framework in the domain of implementing innovation to explain conditions that might contribute implementation for innovations in variety of contexts.

Consequently, more research is needed to identify factors that should be taken into consideration when assisting higher education institutions with implementing BL on their campuses. The study will review the literature interactively in addition to utilize Rogers' Diffusion of Innovations and Ely's Eight Conditions for Change.

Need for the Study

BL is a topic of interest that has been anticipated as a significant delivery mode in the higher education landscape for years (Gagnon et al., 2020; Graham, 2006; Moskal et al., 2013; Niemiec & Otte, 2010; Norberg et al., 2011). The 2019 EDUCAUSE Horizon Report highlighted "Blended Learning Designs" as one of the six key trends driving technology adoption in higher education for the next 1 to 2 years (Alexander et al., 2019). The number of universities that have implemented blended courses is increasing rapidly, and millions of students have been enrolled in these courses (Gleason & Greenhow, 2017; Picciano, 2016). This corresponds with the results of Campus Technology's 2018 Teaching with Technology Survey, which found that 87% of faculty members at universities across the American nation were implementing either fully online or blended instruction designs in their courses (Kelly, 2019).

A current and sudden movement toward online learning and BL has become apparent as a consequence of the COVID-19 pandemic (Gagnon et al., 2020). During the spring of 2020, higher education institutions worldwide were forced to close their campuses and immediately turn to virtual delivery (Gagnon et al., 2020). However, this immediate turn as a short-term response to the COVID-19 pandemic could be a pivot, a disparaging term used recently in the instructional design and technology arena (Lockee, 2020). This term reflects the questionable quality of the associated learning experience, which should be the result of careful instructional design and planning over several months of development (Hodges et al., 2020).

Despite this quick transition to BL and questions about its quality and efficacy, it can also be interpreted as an opportunity to share successes, challenges, and lessons learned. It is also an opportunity to consider additional efforts to establish fundamental principles for designing learning solutions for certain circumstances (Lockee, 2020) such as natural disasters, epidemics,

pandemics, or any other extraordinary conditions that disrupt the learning experience. There is a possibility that the significance of implementing BL has been defended widely because of its likely opportunities, such as the promise of facilitated flexibility and accessibility (Gagnon et al., 2020). To facilitate such implementation, it is critical to understand and take into consideration factors that could increase the efficacy of BL. This could potentially hasten the implementation of new delivery methods across institutions.

Purpose Statement of the Study

Implementing innovations is a primary concern in the Saudi Ministry of Education (MoE, 2019a). However, the implementation of BL as an innovation has been delayed because of a lack of standards-based tools to guide academic institutions (Alebaikan, 2011; Graham et al., 2013; Mirriahi et al., 2015). Making allowances for these potentialities in the proposed changes can affect an institution's rate of implementation (Rogers, 2003).

Thus, the purpose of this study is to conduct an integrative literature review in order to generate new knowledge about how the implementation of BL in higher education settings is studied to identify related institutional factors in empirical studies. The study seeks to disentangle various interpretations of BL and identify, classify, and synthesize factors that should be addressed to successfully implement BL through an extensive, integrative review of the literature.

Research Questions

The proposed study will focus on the following qualitative research questions:

1. Based on the literature, what are the factors affecting the implementation of BL?

2. Based on the literature, how do the factors affecting the implementation of BL align with the work of Rogers's Diffusion of Innovation?

3. Based on the literature, how do the factors affecting the implementation of BL align with the work of Ely's Eight Conditions for Technological Change?

Benefits of the Study

Implementing BL in KSA is an identified approach to achieve several goals outlined by the Ministry of Education (MoE) and National eLearning Center (NeLC) (MoE, 2019a). In light of the MoE's mission to motivate Saudi universities to reduce class attendance hours, the NeLC has been established to make strides toward adoption of new e-learning initiatives such as blended learning (NeLC, 2019). The goal of the center is to control the quality of e-learning (NeLC, 2019). Thus, this study will align with the Ministry of Education objective by investigating more researchers regarding the adopting and implementation of BL.

The study will suggest new perception of critical factors that may affect implementing BL in higher education institutions, especially Saudi universities, primarily through literature review. The decision makers and stakeholders who are agents of change for implementing BL in their universities would benefit from the study. The discussion of these factors provides administrators, faculty, and researchers valuable context and suggestions to adapt these considerations into their contexts.

To summarize, according to Moskal et al. (2013) "whatever the motivation to blend, it is clear that the strategy works best when clearly aligned with the institution's mission and goals and the needs of students, faculty, and institution are simultaneously addressed" (p. 20).

Organization of the Proposed Study

This dissertation is composed of five chapters. Chapter 1 has provided a brief introduction to the topic of the study along with a discussion of the need for the study, the purpose statement, the research questions, and the study's significance. Chapter 2 discusses the

historical development of BL in literature related to this study, as well as technologies incorporated in BL. This chapter also reviews the advantages and disadvantages of implementing BL, its theoretical foundation, and additional context for the study. Chapter 3 discusses the methodological approach used in this study including the purpose, the study design, and the procedures for conducting an integrative literature review (ILR). The chapter also discusses strategies for conducting ILR, which is inclusive of five parts: problem identification, literature search, data evaluation, data analysis, and presentation of the results. Chapter 4 presents the findings from ILR based on existing empirical studies. Chapter 5 discusses the findings obtained from this integrative literature review and concludes the study.

Chapter Two: Literature Review

This chapter initially reviews the literature related to this study and includes three sections. In the first section, the literature reviews studies related to blended learning, including a brief history of BL, BL in higher education institutions, its definition and design, the infrastructures it uses, opportunities and challenges associated with it, and factors that predict success. The second section reviews the theoretical underpinnings of a potential implementation of BL. The last section describes the study's context, followed by a concluding discussion of the chapter as a whole.

Blended Learning

Rise of BL

Higher education has changed their delivery models through time to evolve, adapt, or adjust to the present requirements for providing access to learning opportunities (Kastner, 2019). In recent years novel variant of teaching and learning at a distance has arisen across higher education (Liashenko & Hnapovska, 2019; Tandoh et al., 2014). One of these variations is blended learning, which includes integration face-to-face instruction with online learning (Liashenko & Hnapovska, 2019).

The concept of BL as a mix of delivering learning inside and outside classrooms goes back to the 1920s and 1930s, when some students in rural areas wanted to complete high school, trade school, or university through correspondence courses and face-to-face meetings (Rose & Ray, 2011). Since the 1970s, open universities have integrated technology as a medium to deliver instruction in print or electronic formats while providing summer school for students in residence (Moore, 2005). In the 1990s, with the rapid growth of the Internet and the World Wide Web, the renown of distance education has increased, producing new terminologies such as online

learning and web-based training (Güzera & Canera, 2014). Online learning is referring to "Internet-delivered instruction to deliver course content to individual students in various locations, including their homes" (Kastner, 2019, p 27).

In the early 2000s, as a side effect of the rapid growth of online learning in higher education, new and different labels have emerged such as mixed mode, hybrid, combined, or blended learning (Moskal et al., 2013; Rasheed et al., 2020). Blended learning is the most often utilized label, referring to the same concept and delivery of learning and incorporating face-to-face instruction with online learning components (Moskal et al., 2013; Picciano, 2014; Rasheed et al., 2020).

Consequently, academic institutions began to adopt blended learning with the accreditation of universities such as the University of Phoenix, University of Central Florida, University of Wisconsin-Milwaukee (Alebaikan, 2011) and Brigham Young University (Graham, 2006; Graham et al., 2013). In recent years, universities have sought to provide the most effective face-to-face settings and combine them with the best online settings to achieve a desirable BL experience.

BL in higher education institutions

At the educational institutional level, most universities differentiate between traditional and online courses, whereas blended courses lack clear categorization (Graham et al., 2013). Moskal et al. (2013) agree with Graham and his colleagues that face-to-face and fully online courses are well established; however, the conception of BL and how best to blend is still seeking its place in academic setting (see Figure 1).

In the last decades, BL has increasingly been implemented in higher education institutions for various interests, such as advancing in ICT helps provide more flexibility and

accessibility, improving student enrollments (Gleason & Greenhow, 2017; Kastner, 2019),

solving budget constraints, addressing pressures for accountability (Graham, 2013; Lightner &

Lightner-Laws, 2016; Voegele, 2012), attempting to reduce dropout rates (López-Pérez et al.,

2011), and staying technologically current and competitive (Adekola et al., 2017; Singleton,

2012).

Figure 1

Spectrum of Course-Delivery Modalities in Higher Education
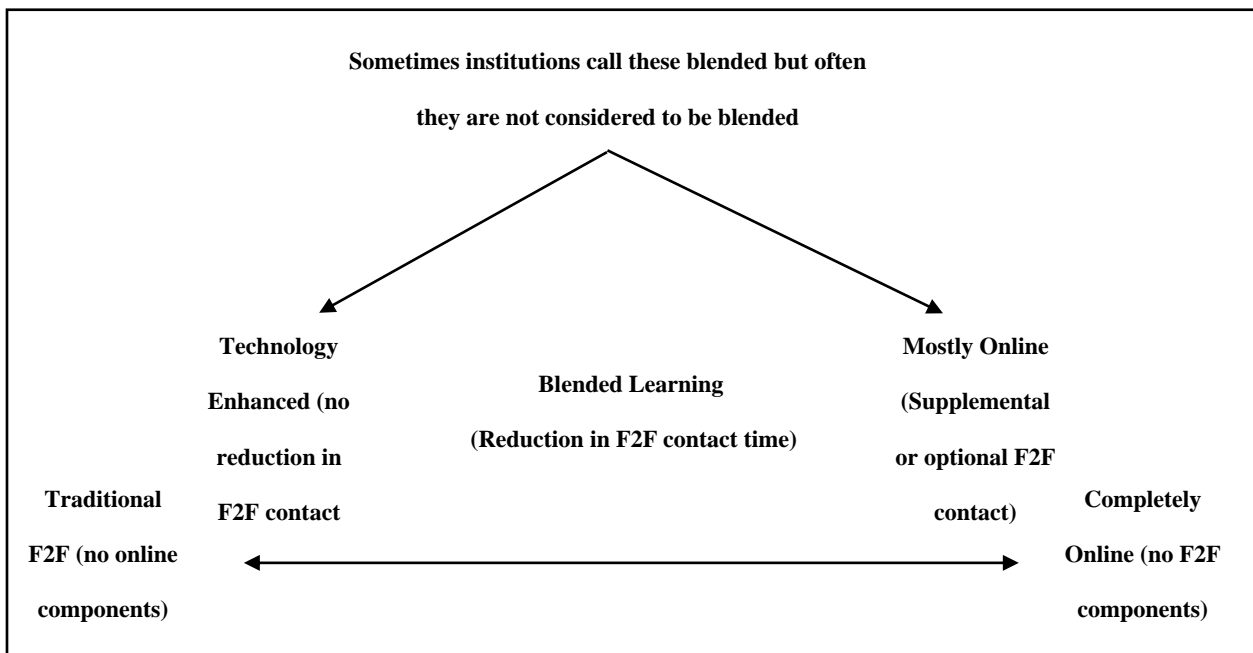
Source: Adapted from Graham et al. (2013, P.5).

According to Osguthorpe and Graham (2003) the aims for designing BL environments

include the following:

- Pedagogy must be rich and redesigned to use both classroom and online learning to

  advantage,

- Access to learning should be expanded by using online components to enhance

  accessibility,

- Social interaction should be facilitated both in the classroom and online,

- Personal agency (student control) should be implemented to give the students choices in their learning,

- Cost-effectiveness could be considered particularly for institutions that want to increase student enrollment, and

- Facility of revision should be analyzed to modify online components based on student needs or the speed of course progress.

The implementation of BL at any institution should be decided based on the specific goals it intends to accomplish (Moskal et al., 2013; Stein & Graham, 2020). The institutions implementing BL should be well-informed of the rationales in support of the blend and the expected consequences of the integration (Medina, 2018). Stein and Graham (2020) also confirmed these goals can be gained if BL is prepared intentionally to accomplish the outlined goals by paying attention to "a purposeful design process and appropriate standards" (p.13).

According to Chew (2009) in higher education institutions, there is not a standard nor a model to BL for all disciplines and all universities. BL has been implemented in diverse formats, and customized based on different needs of individuals, disciplines or institutions (Khodabandelou et al., 2017). In this respect, across academic institutions in the United States, BL has been implemented in different universities.

University of Central Florida (UCF): had pioneered in blended learning with a multi-year study examining the success of BL (Porter et al., 2014). UCF offers two distinct forms of web-based courses one of them called "M course" which is "mixed-mode" blended courses specified for decreasing seat time that include classroom attendance and online instruction (Dziuban et al., 2006). In blended courses with three credit hours, one hour only allocated for

face-to-face classroom time, so most of content delivered online to substitute for some classroom meetings (Dziuban & Moskal, 2001). The university has predicted BL is able to meet students' circumstances and save cost due to reductions in physical infrastructure cost (Dziuban et al., 2006). In 2011, the American Association of State Colleges and Universities and the University of Central Florida received an NGLC grant in order helping 20 universities to implement BL (Porter et al., 2014).

University of Phoenix (UOPX): is the largest accredited profit university in the US, offers courses called FlexNet that mix campus-based and online learning, students are met one-third of the time in a face-to-face format and two-thirds in an online format in between (Alebaikan & Troudi, 2010b; Graham, 2006; Taylor & Newton, 2013). In blended learning, students have orientations and presentations experience both at the beginning and the end of the semester with online learning experiences in between (Badawi, 2009; Graham, 2006). The university provides an equal learning experience via face-to-face residential programs, entirely online programs, or blended learning programs which allow students to choose the program that best meets their budget and time constraints (Badawi, 2009; Hejazifar, 2012).

University of Wisconsin-Milwaukee (UWM): is another example that have had over a decade of experience with developing BL (Graham et al., 2013). Since 2001, UWM has developed 8 blended degree programs and right now the university offers a variety of blended "hybrid" courses over approximately 100 each semester (UWM, 2019). The blended learning course is mixing traditional face-to-face classroom instruction with at least 20% online learning in order to reduce the amount of on-campus attendance or "seat time" (UWM, 2019). BL courses are designed in three formats (H1, H2, H3) based on the percentage of online learning represented as 21-50%, 51-80%, and 81-99% (UWM, 2019).

At an institutional level, blended learning could be existed on a continuum that is between full face-to-face instructions on one end and completely online instructions on the other end (Graham et al., 2013). It appears that most institutions do not provide a clear definition of BL and consider it can be fallen anywhere in this continuum. As face-to-face and online proportions vary widely at the above institutions, this adheres to the definition of BL as courses that some educational experiences have been transferred online without the absence of the face-to-face portion (Ranganathan et al., 2007).

In general, in diverse settings and institutions, different thoughts exist regarding what constitutes a BL environment (Porter et al., 2014), and some institutions have a standard definition of BL, many have not (Blanchette, 2016). BL constitutes "considerable variation across institutional contexts" (Graham, 2013, p. 3), which leads to one of the most necessary challenges higher education faces: what is the appropriate proportion for face-to-face and online and how to blend learning methods effectively (Graham, 2006).

To date, research has shown that BL implementation varies among universities based on three specific stages (Graham et al., 2013):

- Stage 1: Awareness/exploration: no clear institutional BL strategy with limited support.
- Stage 2: Adoption/early implementation: new policies and practices are implemented to support blended learning.
- Stage 3: Mature implementation/growth: well-established strategies, structure, and support occur for blended learning.

The distinctions between stages help institutions determine their level and what factors they should consider in successfully transforming from awareness to mature implementation of BL.

Definition of BL

A review of the literature reveals that current research has usually used terms "blended learning" and "hybrid learning" interchangeably (Abdelrahman & Irby, 2016; Graham, 2009; Marunić & Glažar, 2015; O'Byrne & Pytash, 2015); however, in the United States, hybrid learning has been used most often (AlGhanmi, 2018; Martyn, 2003) while blended learning has been used in Kingdom of Saudi Arabia and United Kingdom (AlGhanmi, 2018). According to Hrastinski (2019), the term "hybrid learning" has been more broadly accepted in practice than in research; at the same time, there are fewer cited articles on hybrid learning than on blended learning.

On the contrary, some researchers stated their rejection of the term "hybrid" as a synonym for "blended" because they do not mean the same thing (Osguthorpe & Graham, 2003). Other researchers argued that that the term "blended learning" is a misnomer and that terms such as "blended instruction," "blended teaching," or "blended pedagogy" more appropriately represent this teaching method (Oliver & Trigwell, 2005). They mentioned that the term "learning" should be abandoned because denotes an assimilation of new knowledge that is what the learner does, whereas "instruction" is what the instructor does with technology in a blended course (Oliver & Trigwell, 2005). So, despite BL becoming more and more popular, there are negative aspects associated with it, including confusion regarding BL as a concept (Chen & Lu, 2013; Oliver & Trigwell, 2005).

The term BL has had many definitions since its appearance and its meaning has evolved over time. According to Jones (2006), "when we use the term blended learning, there is a danger of believing everyone shares the same understanding or definition of this term" (p.186). Attributes such as "multifaceted" or "flexible nature" make BL seems overwhelming; because

there is no agreed definition of BL in the literature, the debate about it has continued (Niemiec &

Otte, 2010; Picciano, 2014). According to Norberg et al. (2011), the term "blended learning" has

been seen as "problematic", and how this blended learning occurs remains vague. Moreover, this

confusion considered as a failure side of blended learning that leads to avoid using it as a

"discriminating" label (Oliver & Trigwell, 2005).

Many attempts have been made to define BL. For example, depending on a learning

environment's physical dimensions, BL can be defined as a "a continuum of instructional models

ranging from fully face-to-face to fully online" (Dziuban et al., 2004, p. 2), "combination of

instruction from two historically separate models of teaching and learning: traditional face-to-

face learning systems and distributed learning systems" with confirming "distributed learning

systems as the utilization of computer-based technologies outside of class time" (Graham, 2006,

p. 5), "an integration of face-to-face oral communication and online written communication such

that the strengths of each are blended into a unique learning experience congruent with the

context and intended educational purpose" (Garrison & Vaughan, 2008, p. 5), or "a flexible

approach to course design that supports the blending of different times and places for learning,

offering some of the conveniences of fully online courses without the complete loss of face-to-

face contact" (O'Connor et al., 2011, p. 64).

Focusing on seat time, blended learning is "a course that replace a portion of face to face

instruction with Web components" and that "allow for the flexibility of utilizing Web resources

to reduce the on campus time, yet allow face to face interaction as well" (Dziuban et al., 2005, p.

88), BL courses incorporate online with traditional face-to-face classes by replacing some seat

time in the conventional classroom with an online component (Picciano, 2006). "Blended

courses [serve] as a means to maximize utilization of classroom space with the reduced seat time component" (Moskal et al., 2013, p. 20).

Based on the percentage of content or time in class and online, "blended courses and programs are defined as having between 30 percent and 79 percent of the course content delivered online" (Allen et al., 2007, p. 5). BL is defined as "instructional conditions in which at least 50% of total course time is face-to-face and students working online outside of the classroom spend the remainder of time, up to the additional 50%" and "could accrue from as little as 25% online work and 75% face-to-face work" (Bernard et al., 2014, p. 91).

Depending on technologies, BL can be defined as "combin[ing] opportunities for live Web based instruction with delayed or asynchronous online instruction as well as face-to-face meetings" (Bonk et al., 2002, p. 98), "combin[ing] any form of instructional technology (e.g., videotape, CD-ROM, web-based training, film) with face-to-face instructor-led training" (Driscoll, 2002, p. 1), "all combinations of FTF learning with technology-based learning: traditional education can be enriched with the use of technology and learning with technology can profit from FTF meetings" (Kerres & Witt, 2003, p. 101), or it is about "integrating synchronous (face-to-face) and asynchronous (text-based Internet) learning activities" (Garrison & Kanuka, 2004, p. 96).

Concentrating on quality, BL should be "a thoughtful integration of classroom face-to-face learning experiences with online learning experiences" (Garrison & Kanuka, 2004, p. 96), or "a course that integrate online with traditional face-to-face class activities in a planned, pedagogically valuable manner" (Picciano, 2009, p. 10).

With so many various definitions, understanding of BL is often ambiguous (Chen & Lu, 2013; Picciano, 2014). Uncertainty and ill-defined terminology in the realm of education leads to

different connotations across different people, which indicates that BL may be under-utilized (Driscoll, 2002).

Design of BL

Although BL has no precise definition, a common general theme of BL presented in most discussions in the literature has been the recognition of some integration of virtual environment (online) and physical environment (face-to-face) (Akpan, 2015). According to Head et al. (2002), the delivery of instruction in different learning environments takes different forms based on time and place:

- same time/same place (traditional classroom),

- same time/different place (satellite system, interactive video),

- different time/same place (computer-based delivery), and

- different time/different place (virtual learning environment, which may include paper-based content, audio- and videotapes, CD-ROM, and web-based modes).

An essential requirement for a blended learning environment is that the "student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path, and/or pace and at least in part at a supervised brick-and-mortar location away from home" (Staker & Horn, 2012, p. 3). Typically, face-to-face interaction occurs in a synchronous setting in the physical classroom when live, two-way oral and/or visual communications between students and instructors occurs at the same time (Graham, 2006; Holden et al., 2010). On the other hand, online learning interaction could be asynchronous when communication between the student and instructor does not take place at the same time, providing students with control of their learning over content, time, and location (Powell et al., 2014; Wu et al., 2008).

Both conventional and online learning have strengths and weakness (Utami, 2018), and the two contexts have different characteristics (Garrison & Vaughan, 2008). Although studies have discussed the strengths and weaknesses of conventional and online learning (Graham, 2006), it is not well known how the two forms can be connected in the BL design (Lai et al., 2016). Designing a BL course is not simply injecting technology onto a conventional course or employing technology as an add-on to deliver extra information (Alebaikan, 2010; Vaughan et al., 2017). It should be built through a transformative redesign procedure by combining physical and virtual instruction, resulting in what is called "bricks and click" (Medina, 2018, p. 43).

At the same time, there is no perfect BL solution (Marsh, 2012), and there is no fixed guideline as to how much, how little, or what parts of courses should be face to face and what parts should take place online (Garrison & Kanuka, 2004). As agreed by Stein and Graham (2020), a measured determination about that a specific percentage must be online, or that a specific amount of traditionally onsite meetings be replaced with online learning is often "arbitrary".

Spring et al. (2018) argued that successfully implementation of blended learning should be well-coordinated that each component (face to face or online) supporting each other. Described as "both simple and complex," BL can be simplistically realized as an association between a traditional classroom and online learning (Garrison & Kanuka, 2004, p. 96). However, the challenge of designing an application in different contexts can make implementation of BL complex (Garrison & Kanuka, 2004; Jerke & Mosterd, 2017). Another challenge is less about measuring time devoted face to face or online than about integrating the two principal constituents such that BL is not "just adding on to the existing dominant approach or method" (Garrison & Kanuka, 2004, p. 97). This issue demonstrated what Stein and Graham (2020)

warned from "course and a half syndrome" by adding online or onsite activities to an existing course design when BL should be designed by replacing not expanding onsite activities.

According to Graham (2006) blended learning could resemble one of four different models: activity-level, course-level, program-level, and institutional-level.

- Blended learning at activity level when a given lesson comprises both face-to-face and online learning activities.

- Blended learning at course level requires integration of instruction delivered face to face and online within a particular course.

- Blended learning at program level could follow one of two different models: in one, the students select a mix between face-to-face and online courses, whereas in the other, integration between the two delivery modes is specified to some degree by the instructor.

- Blended learning at institutional level involves organizational dedication to blending face-to-face and computer mediated instruction to create institution-specific models.

However, the nature of blended learning across all these levels is confirmed by what students, instructors, and administrators decided it together (Graham, 2006). Therefore, blended learning at the level of course or activity is typically conducted by instructor, whereas learning at program and institutional levels is conducted by administrator stakeholders seeking for cost effectiveness and accessibility (Graham, 2009). Accordingly, blended learning can provide several ways to allow users to adapt to the model that perfect match to their pedagogical targets and the physical setting (Kazakoff et al., 2018). Higher education institutions keep seeking the best practices that capitalize on blended learning modes in diverse contexts and levels (Garrison & Vaughan, 2008).

Graham (2006) also proposed three types of blend that relate to the primary purpose of the BL

- Enabling blends: Emphasize consideration of matters of access and convenience. For example, enabling blends are meant to enhance flexibility for the students or strive to ensure the equivalent educational experience to that delivered face-to-face is delivered through a different modality (e.g., students choose the option—face-to-face, online, or BL—that best meets their demands).

- Enhancing blends: Enable slight modification to the pedagogy. For example, enhancing blends aim to improve and supplement learning experiences delivered face-to-face with additional resources and materials delivered online or that use technology-equipped classrooms (e.g., course content and activities that are uploaded on learning management systems "LMSs").

- Transforming blends: Enable major modification in "pedagogical frameworks, activities, and the use of technology" (pp. 13–14). For example, transforming blends intend to provide learning experiences that are not practically possible without high-end technologies (e.g., innovative technology-mediated approaches: live-virtual-constructive simulations, problem-based embedded training, mobile devices).

According to Graham (2006), none of these blends are inadequate, they simply have different concentrations. He also mentions that enabling blends are found in programs that come out of "a distance learning tradition," enhancing blends are found in most traditional university settings, while transformative blends are found more in the corporate environment than in the university environment (Graham, 2006, p.15). The limitations to transforming BL in higher education include specific timelines, classroom occupancy, location concerns, and modern

infrastructure expenses. However, there is some hope that enhancing blends are the first step toward more transformative blends (Graham, 2006). So, institutions of higher education will offer diverse BL classifications instead of developing and offering BL courses that fit one of the classifications (Rust, 2010).

Recently, Stein and Graham (2020) identified three distinct design approaches for the BL course:

- Hybrid: Blending by decreasing the frequency of on-site, face-to-face sessions. Online learning activities are designed to replace a significant amount of on-site learning activities.

- Flipped Classroom: Blending by exchanging learning activities. Typical lectures or presentations are designed to be online while homework is done and reversed for on-site activities.

- Hyflex (hybrid + flexibility): Blending by letting students choose online or on-site. These are fully online courses designed with regular, optional on-site sessions for those students who want face-to-face interactions or need extra help.

Stein and Graham (2020) argued that the right choice of blended course structure depends on the faculty objectives, the subject matter, and the easiness and availability of a technology for both faculty and students. Lockee (2020) emphasized that best practice in these approaches involves keeping up to date with the relevant ideas for designing learning environments that assist distribution over time and space.

Infrastructures used in BL

These days students have been provided with state-of-the-art technology, computer networks, Internet usage, and the use of synchronous and asynchronous technology in most

higher education institutions (Keengwe et al., 2010). Blended learning is referred to as a delivery mode because it uses a "technological system to convey instruction to the intended audience" (Head et al., 2002, p. 264). BL is widely employed to utilize technology inside and outside of the classroom. It has been used as an umbrella term to mean adopting technology to deliver learning in academia (Hrastinski, 2019). However, this technology does not construct learning outcomes; rather, it is one factor among others that contribute to an effective learning experience (Head et al., 2002). According to Clark (1983), "media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition." (p. 445). Thus, any significant difference in learning outcomes occurs because teaching methods are not attributed to a delivery mode (Clark, 1983). Clark further argued that the selection of course delivery mode should be an economic decision (Clark, 1994).

These technologies have been used to supplement traditional courses in higher education institutions (Ahmed, 2010). Mixing between two delivery modes in BL is considered a "bridge" for advanced technologies to be incorporated with instructions methods (Delialioglu & Yildirim, 2008). A primary intention to apply technology in BL is to save time and provide flexibility, these features of technology along with others make ideas that were not possible in face-to-face classrooms feasible in an online or blended learning mods (Stein & Graham, 2020). When technology applied correctly, it enables BL to flourish.

However, keep in mind BL is not just about "finding the right mix of technologies or simply increasing student access to content in a new medium" (Hinkhouse, 2013, p. 4). This concern is reflected well in what Mishra and Koehler's indicated,

> there is no single technological solution that applies for every teacher, every course, or
>
> every view of teaching. Quality teaching requires developing a nuanced understanding of

the complex relationships between technology, content, and pedagogy, and using this understanding to develop appropriate, context-specific strategies and representations (Mishra & Koehler, 2006, p.1029).

"Early studies showed that technology can be a 'double- edged sword' if not properly planned and implemented" (Delialioglu & Yildirim, 2008, p. 475). The selection of an appropriate technology should be based on its potential for conveying necessary media attributes for implementing the chosen teaching methods (Head et al., 2002). Further, selection of such technology is limited by some constraints and available infrastructure (Head et al., 2002).

Today's challenge for institutions is the abundance of technology available, and the awareness of one size does not fit all (Stein & Graham, 2020). So, universities looking to implement BL should have the central technological infrastructure required for adopting BL that is both effective and user-friendly (Taylor & Newton, 2013).

As BL has quickly expanded, determining what instructional technologies are most useful becomes increasingly necessary. Because such technologies are a mixture of hardware and software, the hardware component includes a tool that shapes the technology as a physical object, whereas the software part provides an information base for the tool (Rogers, 2003). Holden et al. (2010) provided some examples of synchronous and asynchronous hardware and software technologies that support content distribution:

- Synchronous technologies: web-based instruction (WBI), video teleconferencing (VTC), and virtual worlds.
- Asynchronous technologies: web-based instruction (WBI), audio conferencing, audio-graphics/electronic whiteboards, computer-based instruction (CBI), correspondence

(print), instructional television (ITV), recorded audio (tape, CD ROM, or podcast), recorded video (tape, DVD, Vodcast), and satellite e-learning.

Any incorporation of these technologies could be used in both the online and traditional portions of the blended learning environment (Holden et al., 2010). Most blended learning integrates synchronous meetings and asynchronous modalities based on technology (Norberg et al., 2011). According to Stein and Graham (2020), on the hand BL synchronous interactions may occur both in face to face during onsite meetings or in conversations, and online, e.g. through live chat or video conferencing. On the other hand, BL asynchronous interactions may occur without instructors and students having to be in the same place at the same time, e.g. send a message or post comments to a discussion forum (Stein & Graham, 2020) (see Table 1).

Table 1

Online Social Tools Designed for Synchronous or Asynchronous Interaction

Technology	Synchronous	Asynchronous
▪ Web conferencing X (e.g., Zoom, Skype)	√	
▪ Discussion forums		√
▪ Blogs (e.g., WordPress, Medium)		√
▪ Email	√	√
▪ Text messaging	√	√
▪ Chat (e.g., Slack, Pronto)	√	√
▪ Collaborative documents (e.g., Google Docs, Office365)		

Note. Adapted from Stein, J., & Graham, C. R. (2020). Blended teaching and learning. In J. Stein & C. R. Graham (Eds.), *Essentials for blended learning: A standards-based guide* (2nd ed., pp. 9–24). Routledge.

Some BL provides both synchronous and asynchronous technologies to accommodate students (such as schedule issues, time zones, etc.), and to provide students with more options (Stein & Graham, 2020). As a result, synchronous and/or asynchronous technologies have

extended the flexibility and accessibility of classroom education resources, including instruction, peer feedback, and course materials (Abdelrahman & Irby, 2016).

Picciano's (2009) broad conceptualization of BL shows that a wide variety of technology could be integrated with conventional and online learning. The extent of integration technology with BL could be divided into four groups. In group A, students attend class in person with minimal use of technology such as email, web for e-lectures, etc. In group B, students meet online with simple technology tools such as course management system (Blackboard, WebCT, Moodle), electronic bulletin boards, etc. In group C, students in the classroom are provided with varying degrees of technology such as integrative simulation, digitally controlled experiment, etc. In group D, students meet instructors online using more advanced technology such as interactive videoconferencing (Picciano, 2009) (see Figure 2).

Because no two blended learning designs are identical, practitioners have employed technologies in different ways to complement face-to-face courses (Al-Busaidi, 2013).

Figure 2

Broad Conceptualization of Blended Learning
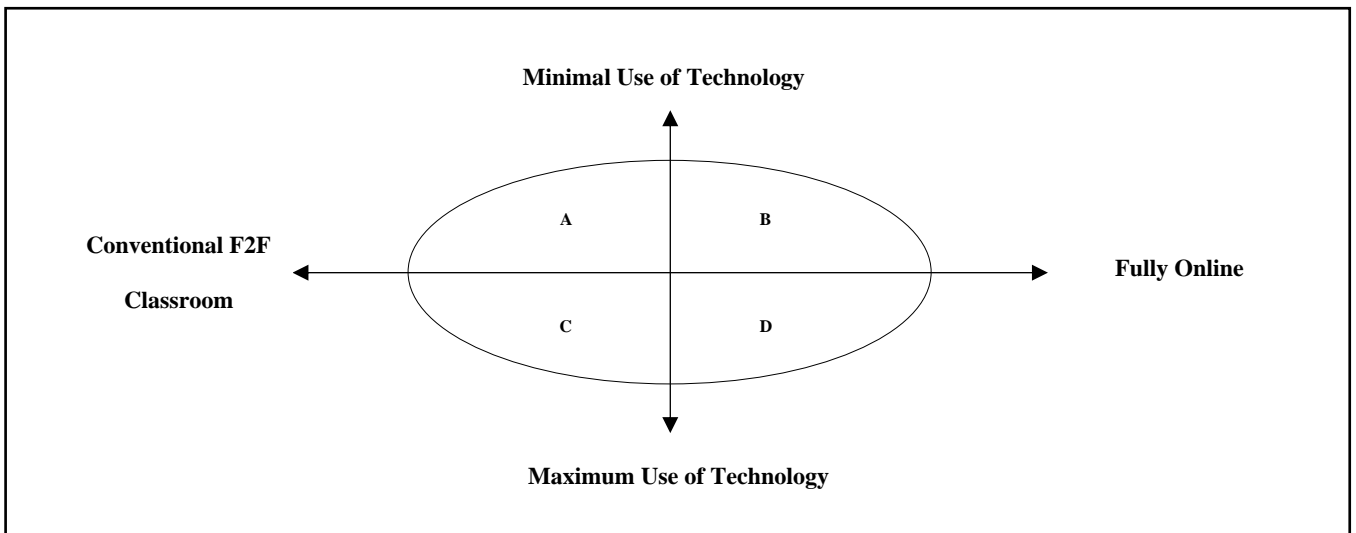
Source: Adapted from Picciano (2009, p. 11)

For example, some universities use information and communication technology (ICT) to deliver course contents outside the physical classroom (Kim, 2007) as a means of flexible teaching and learning to create, share, and save information both inside and outside the classroom. ICTs includes PCs, the Web, broadcasting devices such as radio and TV, phones, tablets, and other communication devices along with software applications such as those for word processing and spreadsheets (Kaur, 2018). Guzzo et al. (2012) mentioned that BL based on ICT technologies and face-to-face approaches have potential benefits such as flexibility and convenience, reduced seat time, place flexibility, and cost reduction. They argued that students can learn at their own pace and on their own schedules, decrease time commuting, and increase time available for work or family commitments.

Educational institutions have begun adopted blended synchronous learning that defined as "learning and teaching where remote students participate in face-to-face classes by means of rich-media synchronous technologies such as video conferencing, web conferencing, or virtual worlds" (Bower et al., 2015, p. 1). These technologies tools have been utilized and distributed differently between instructors and students (Bower et al., 2015). There is a variety of technological tools with a variety of affordances available to facilitate blended synchronous learning. The tools vary from room-based videoconferencing systems, desktop web-conferencing platforms, web-conferencing platforms, chat rooms with video feeds, virtual worlds, and custom combinations of Web 2.0 applications (Bower et.al, 2015). The blended synchronous learning technologies offer students with the option of being present at blended synchronous classes face to face or remotely based on their circumstances (Bower et.al, 2015).

Some universities apply virtual learning environments (VLEs) to deliver the online portion of blended learning (Osgerby, 2013). VLEs need specific software set up on users'

computers, but most VLEs are web-based, so users often need Internet to access VLEs (Akpan, 2015). VLEs benefit both a course's administrative and learning aspects (Ekhmimi, 2018). VLEs are useful for course management functions such as enrollment, student support, attendance, assessment, assignment creation, and submission protocols (Ekhmimi, 2018). VLEs also are employed in sharing learning activities via whiteboards, discussion forums, and chat (Ekhmimi, 2018).

Most universities incorporate learning management systems (LMSs) through which courses can be offered completely online alongside with the traditional classroom (Abdelrahman & Irby, 2016). LMSs sometimes called "course management systems" or "e-learning platforms" (Linder et.al, 2017). Most institutions have funded one LMS for their campus (Linder et.al, 2017). LMSs as virtual platforms have been used by both faculty and students and are considered student's partners, accompanying students throughout their university studies (Appavoo et al., 2018). Vadnere (2018) describes LMSs that are open source, such as Canvas; cloud-based, such as Google Classroom; and proprietary, such as Blackboard. LMSs are powerful and useful tools that help faculty with content delivery, learning assessment, communications, and course management (Almoslamani, 2018). They allow faculty to design content by adding URL links, uploading media, and creating tasks (Eldeeb, 2019). LMSs also provide students with timetables, examination results, assignments, and learning materials (Vadnere, 2018). So, for the faculty who designs BL course, it is important to explore the wide array of tools included in LMSs and decide what tools that support students learning (Linder et.al, 2017). As confirmed by Wichadee (2018), online platform sessions provide students with opportunities to access and interact anywhere and everywhere. Thus, a noticeable relationship in BL environments among flexibility, learning

experience, and the benefits of online platforms in online sessions should be considered a predictor of BL effectiveness (Wichadee, 2018).

Opportunities of BL

There are a lot of excitement about the opportunities that BL presents for institutions, faculty, and students. Matheos and Cleveland-Innes (2018) outlined some advantages of BL, such as increased flexibility, access to instruction, reduced class time, and optimization of resources/cost reduction. They argued that the success of BL in any educational institution requires alignment between faculty and student goals, reallocation of learning resources, support for faculty and students, and strengthened infrastructure.

Halverson et al. (2017) mentioned that institutions seek to implement BL to improved cost effectiveness and resource use, which are important for avoiding financial issues such as decreased governmental or grantor funding and increasing costs of building and campus facility maintenance and power; helping institutions stay current in a progressively competitive educational environment; and increasing access and flexibility for both institutions and students experiencing demographic and economic changes. Chou et al. (2013) agreed that cost-effectiveness in terms of infrastructure and classroom maintenance is the greatest benefit of blended learning for institutions.

Institutions capitalize on providing blended learning courses to maximize classroom space use by reducing seat time, which allows more students and courses to occupy a physical classroom than the traditional classroom environment, particularly with insufficient funding and growing enrollment (Moskal et al., 2013; Oyarzun & Martin, 2013). Graham et al. (2013) mentioned that institutions adopted BL to find a solution for one or more important universities issues, such as need to keep up with rapid growth, seek to provide access to further students,

solve the deficiency of physical infrastructure, and increase flexibility for both faculty members and students. Sharpe et al. (2006) stated that institutions adopt BL for advantages such as ease of provision, meeting variety of student circumstances, enhancement of campus experiences, chances for a global context, and competence of operation.

Some faculty are optimistic about BL enabling them to avoid sacrificing the advantages of one delivery mode for the benefits of the other, thus providing the satisfaction of an asynchronous technology without excluding the advantages of person-to-person contact in face-to-face meetings (Spring et al., 2018). According to Graham (2006), faculty tend to adopt BL to customize delivery of learning materials to course aims. For example, the online learning could be provided between two face to face meetings or before and after the face-to-face meetings as well as materials provided both online and in the traditional classroom. Aldosemani et al. (2019) agreed that BL can integrate the benefits of both face-to-face and online instruction and add flexibility to faculty members' schedules, giving them a chance to manage students' activities and attendance hours for class purposes while reducing on-campus time and offering them extra time for "planning, grading, and supporting out-of-class activities" (p. 2).

BL could provide some benefits for students. Guzzo et al. (2012) mentioned that BL classes may allow students to blend attendance of face-to-face classes for complex subjects with some adaptive online sessions. Students can interact with instructors, peers, and content inside and outside the classroom as online BL sessions expand access to educational offerings, minimize operating costs, and save students mobility and rent costs (Guzzo et al., 2012). Tandoh et al. (2014) stated that students in BL courses enjoy socializing with instructors and peers in face-to-face classroom sessions whereas also enjoying learning where and when you need that offered by online sessions. The authors also mentioned that students can utilize an online self-

paced module to obtain general knowledge on the course content, accompanied by a face-to-face classroom where students drill and practice what they have learned in the module and receive immediate assistance and feedback from teachers and classmates, which enhances learning and performance (Tandoh et al., 2014).

BL could also be suitable for non-traditional students (typically older than college students) trying to obtain post-secondary education to improve their lives (Stein & Graham, 2020). The students work or have families, so they want the flexibility that online offers and rhythm of face-to-face sessions that similar from what they were used to. So, BL schedule may keep them motivated to pursue their studies (Stein & Graham, 2020). Finally, Niemiec and Otte (2010) stated that

> The potential benefits of blended learning are so considerable because blended learning is, at least potentially, the most transformative and pervasive initiative an institution can undertake. It touches on everything, from students and faculty to administration and infrastructure (p.94).

Challenges of BL

Despite the opportunities BL provides, institutions, faculty, and students encounter some barriers in its adoption. Rasheed et al. (2020) examined challenges of BL especially in the online component. The authors mentioned that even though BL provides the benefit of combined face-to-face and online learning, it has raised concerns over the years. They found that providing appropriate technology and effective training support to faculty are the main challenges that educational institutions face. The key challenge for faculty is technology use for teaching. Using learning technology is the key challenge that students face.

Milad (2019) determined the major drawbacks of BL include the high cost of technology accessibility, such as internet access and computers needed for online course components; lack of technical support, which leads instructors to abandon the online component; and the negative attitudes of instructors and students toward online education. Boeren (2016) concluded that even though many universities offer blended learning courses that make resources easily accessible, BL has some disadvantages, such as its high cost, especially at the beginning, including training faculty, setting up the online BL component, hiring technical staff, and providing adequate equipment.

According to Kumi-Yeboah and Smith (2018) issues arising from BL implementation include price of delivery, policy issues, qualified instructional technology staff, faculty training, access to online materials, course creation, student satisfaction, computer and internet skills, and copyright issues. Akpan (2015) mentioned that institutions of higher education need more time and funds for designing and developing BL than for traditional learning. Also, instructors may face a lack of ICT expert support for course design. Along with the aforementioned challenges, Kaur (2013) described the areas where BL could create problems, such as technical challenges, organizational challenges, and instructional design challenges. According to authors, technical challenges may include ensuring the successful use of technology and avoidance of the idea that using technology is simply because of its availability. Another challenge is the lack of organizational understanding that BL is a complex process that needs to be thought out thoroughly to meet students' expectations, redefine instructors' roles, and assess all components of BL to ensure completion (Kaur, 2013).

Lotrecchiano et al. (2013) mentioned some important issues to consider when applying blended learning related to faculty members' and students' time as well as their level of effort

and comfort with online components. Moreover, preparing learning materials for both in-class and online learning, such as presentations, videos, and discussion boards, requires instructors to have the advanced skills necessary to product, format, and edit; without technical skills, this could be a significant challenge (Lotrecchiano et al., 2013). According to Ocak (2010) some barriers preventing faculty from using BL include instructional procedures. community issues, and technical issues. Other challenges include identifying correct instructional methods, finding the time to design, and dealing with the issues of online sections. Community issues could include lack of program support and changes to the instructor's role. Technical issues could arise from discomfort with technology and lack of technical support (Ocak, 2010).

Chen and Lu (2013) stated that although BL has become more popular, there are some negative implications associated with implementing BL in universities. Students' cognitive load increases when instructors designed a lot of face-to-face and online activities. Instructors end up overworked and have trouble balancing the amount of face-to-face and online learning. Moreover, design resources could be lacking in terms of interaction and selection, resulting in much waste in terms of learning resources and energy (Chen & Lu, 2013). Other barriers include students' unrealistic expectations, difficulties with advanced technologies and internet connection, lack of time commitment, insufficient funds, and lack of technical support (Akpan, 2015).

Oh and Park (2009) agreed with other researcher the reasons challenge institutions and faculty towards BL included: lack of instructional and technical support, insufficient training in the use of blended instruction, faculty's motivation and enthusiasm, faculty workloads, time commitment needed to create BL instruction.

So, higher education institutions necessity to confront these issues, or it might be hard to reach widespread success implementing of BL.

Successful Factors of BL

The success of BL is based on multiple factors that must be followed and taken into consideration during implementation (further details about different aspects of these factors will be discussed in chapter 4). No BL advocate can avoid acknowledging that there is plenty to consider particularly from an administrative perspective (Niemiec & Otte, 2010). According to Marsh (2012), although there is no approach to a good blend, several critical factors must be considered to promote effective BL.

According to Niemiec and Otte (2010), understanding the reasons for engaging in blended learning at an institution must take precedence over how to implement it, but there are specific factors that sound indispensable more than the reasons. These include management of change and development within the institution at all levels, implementation of strategies for successful support, utilization of current resources to drive planning and decision making, control of resistance, and solutions to policy issues.

According to Delialioglu and Yildirim (2008), it is necessary to have an effective plan of BL of "how much and what to mix" based on certain criteria (p. 482). These criteria could be attributed to revise of institution policies, design of infrastructure, distribution of resources, arrange scheduling training, support technical problems (Garrison & Kanuka, 2004), student online learning readiness, and instructor competency in online technologies (Delialioglu &Yildirim, 2008).

According to Osguthorpe and Graham (2003), the mix between face-to-face and online instruction is affected by numerous factors such as course instructional objectives, student

characteristics, faculty experience, discipline, developmental level, and online resources. Ten year later Moskal et al. (2013) mentioned that many components determine BL success at any institution, such as student population and acceptance; institutions' mission, plan, and support; faculty responsiveness; and resources availability. After that as confirmed by Halverson et al. (2017), goal alignment and reliable infrastructure are the most substantial factors for successful implementation of BL.

Taylor and Newton (2013) confirmed that successful change to BL requires developing a shared vision, collaborating among executives, faculty, and other institutional individual, aligning the implementation of BL system and process with faculty and student expectations; defining and supporting course design processes and policies, providing technical support for producing, editing, and distributing BL courses materials, and evaluating institutional capability and current practices by employing "self-examination."

Moskal et al. (2013) outlined various components that lead to the framing of BL initiatives at institutions, such as considering the context of institutions, aligning with their goals and objectives, encouraging the alignment of goals and responsibility between the institution's senior executives and faculty, preserving consistency with the institution's capacity, engaging stakeholders in thoughtful deliberation about every element regarding BL, developing faculty members and courses, supporting online students and faculty technically, having sufficient IT infrastructure and network services, conducting longitudinal data collection and ongoing evaluation, constituting institutional policies or contracts, and thinking about how to make BL an investment rather than an expense.

Utami (2018) suggested instructors should develop their computer and internet literacy at the same time institutions must provide training or workshop for the instructors when

implementing BL. Werth and Werth (2014) affirmed that to provide a successful BL environment, instructors should have sufficient technology, training, and time to participate in this environment. They also mentioned that instructors should have intensive training before and during BL implementation to manage courses effectively and that administrative support should be provided.

Milad (2019) mentioned that the implementation of BL can be interpreted differently according to different stakeholders; for example, individual faculty with high levels of performance and care about learning experience select suitable modes of delivery to achieve instructional objectives, whereas administrators with high levels of performance and low concern about learning experience select the most cost-effective modes of delivery to accomplish the same objectives, so the author emphasizes the students' role in selecting and judging what is best for them. Thus, Tandoh et al. (2014) recommended that for implementing BL it is important to concentrate on indicating both limitations and opportunities provided by this delivery mode and to ensure that faculty, students, and administrators are always collaborative, especially in controlling the issues of BL, which requires complete support among all concerned parties.

Once all these factors are met, the processes of transition to BL can be fine-tuned to provide more solid grounds for implementing the BL initiative.

Context of the Study

To put my study into context, it is crucial to provide informative background about Kingdom of Saudi Arabia (KSA) and its educational features. This will include the following: a general background about education, an analysis of higher education in the KSA, an investigation of blended learning (BL) in the KSA, and an overview of BL in universities at large.

General Background about KSA Education

The Ministry of Education was established in 1953 to provide "an exceptional educational system" that builds a wide "knowledge-based community" in the global world (MoE, 2019b). Saudi education is an absolute priority in government planning in the KSA (Jamal Al Lail, 2018). Education is centered on the Islamic faith and Arabic language in most educational sectors and is also free for citizens at all levels, though there is a general policy of gender segregation (Smith & Abouammoh, 2013). This gender separation requirement is attributable to the religious and cultural tenets of the kingdom, which serve as the basis for governmental laws and MoE policies (Almutairy et al., 2014).

Educational sectors in the KSA are institutions that offer general education for students, including schools of all levels, and higher education. This includes public and private universities and specific institutions that teach many programs. All educational institutions' administrations are governed by the MoE (MoE, 2019c).

Currently, Saudi Arabia is concentrating on how to reform the field of education to fulfill its countrywide plans as guided by the 2030 Vision. The 2030 Vision is a nationwide initiative focused on building a knowledge-based economy by decreasing dependence on oil and increasing social vibrancy and economic strength (Vision 2030, 2019).

Thus, education serves as an essential pillar of Vision 2030, and consequently, the largest governmental spending in the KSA goes to enhance education, which was 18.9% (SAR 193 billion) of the budget in 2020 (Abusaaq, 2019) (see Figure 3).

Figure 3

Expenditure by Sector, SAR 1,020 billion

18.9%	Education
17.8%	Military
16.4%	Health and social development
13.8%	General items
10.0%	Security and regional administration
9.6%	Economic resources
5.5%	Infrastructure and transportation
5.3%	Municipal services
2.7%	Public administration
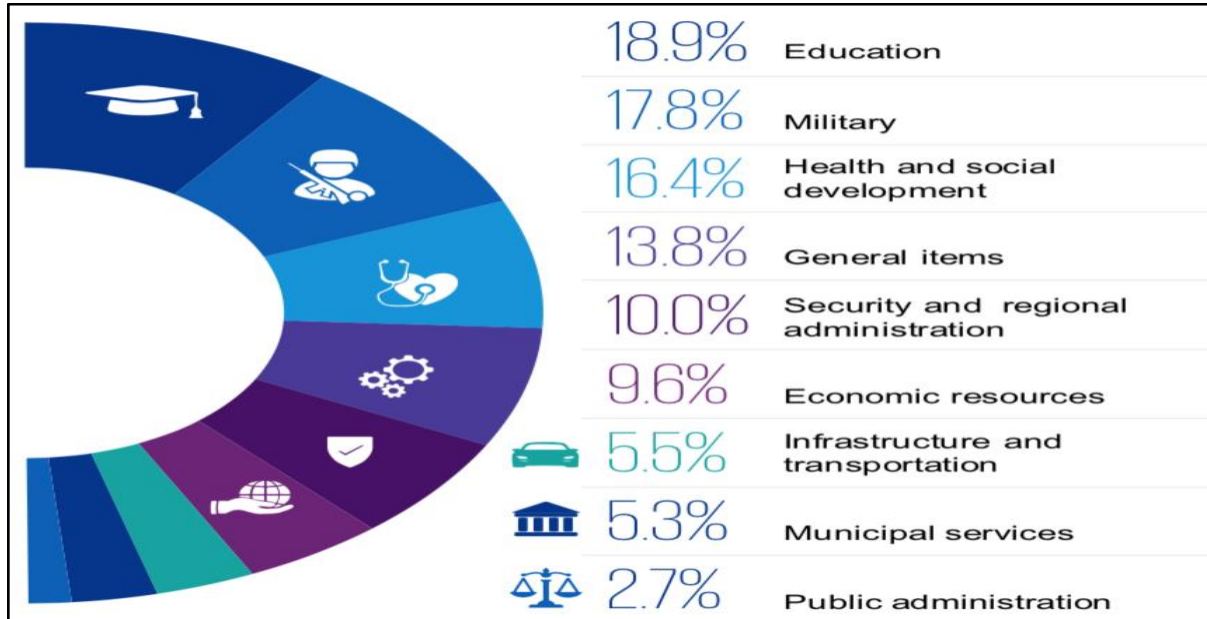
Source: 2020 Annual budget, Ministry of Finance (MoF) [Saudi Arabia].

Higher Education in KSA

Education, specifically higher education, is a crucial institution in a society with a mandate for change and plays a significant role in the political, sociocultural, economic, and academic landscape in the KSA (Binhashim, 2019; Hilal, 2013). Higher education has undergone remarkable improvement over the last few years, and several universities have been established during the last 15 years (Aldawsari, 2016; AlGhanmi, 2018; Weber, 2018). Since the higher education system has received governmental support and extensive funding has been allocated for higher education budgets, it has expanded to include 30 government universities, 10 private universities and 41 private colleges. These institutions are distributed throughout different regions of the KSA to facilitate learning for all students (MoE, 2019b).

To this day, even though the study of Islam remains at the core of Saudi education, higher education provides quality instruction in diverse fields in the arts and sciences to prepare

students for life and work in a global setting or for graduate programs, which grant master and doctoral degrees in different disciplines (Moukali, 2012), and study-abroad opportunities in specialized fields are supported by university or government scholarships (Binhashim, 2019). Furthermore, undergraduate students receive free education, monthly stipends, and lodging in cheap, on-campus dormitories at most Saudi universities (Alahmari, 2017).

All universities in the KSA are gender-segregated, which entails two geographically separated campuses to serve only male or female students, except for King Abdullah University of Science and Technology (KAUST) (Aldawsari, 2016) and some medical schools within specific colleges and universities that allow male and female students to learn together in the same campus (Smith & Abouammoh, 2013). There are gender-specific state universities, such as the Islamic University (which admits male students only) and King Fahd University of Petroleum & Minerals (which admits male students only, except for postgraduate studies) (KFUPM, 2018). Princess Noura bint Abdulrahman University only admits female students (Almalki, 2011).

Male faculties are not allowed to teach female students face-to-face; however, classes taught by male faculty are held using various synchronous technologies, such as closed-circuit television (CCTV) and audio and videoconferencing (Algarni, 2014). When female students attend classrooms, using a telephone in the classroom is the only authorized way for female students to interact with male faculty (Aldawsari, 2016).

Higher education administration has conducted several initiatives that aim to improve the quality and productivity of learning, teaching, research, and community services in both public and private universities (Binhashim, 2019). In a discussion of these initiatives, Gallarotti (2013) mentioned that some of them entailed "the establishment of 10 research centers, 15 university

technological innovation centers in association with King Abdullah City for Science and Technology (KACST), and at least eight technology incubators at KACST and other universities" (p. 5).

Blended Learning in KSA

With the provision of information and communication technology (ICT), higher education has taken fundamental steps to ensure the optimal use of ICT to provide more effective learning environments (Alzahrani, 2017). The Saudi government has instituted a strong physical structure to guarantee ideal utilization of ICT in education (Almutairy et al., 2014).

Since Internet access became officially available across the Kingdom in 1999, most Saudi universities and colleges have gun using Internet-based and technology-based tools to deliver their educational programs (Alahmari, 2017). The introduction of the Internet and modern technology into the educational system has been a major priority in higher education in the KSA. New innovations, such as learning management systems, mobile systems, writing software, and online discussion boards, have all risen in prominence (AlGhanmi, 2018).

The National eLearning Center (NeLC), a division of the MoE, was established as "a clearinghouse and information resource" that provides "digital content," "technical content," "training services," and "advisory services" (Weber, 2018). According to the NeLC, "NeLC is responsible for implementing education, information and communication technologies to improve the efficiency of the educational and training process in all its forms and control its quality" (NeLC, 2019).

The combination of Internet and communication tools within the classroom environment allows Saudi universities to blend face-to-face learning with online modes as a means for adopting technology into any classroom (AlGhanmi, 2018). There is a rapidly growing number

of institutions turning toward BL in Saudi higher education, especially at advanced universities (Aldosemani et al., 2019). Distance education deanships that have been introduced at these universities are now supplemented online with BL models, which will contribute to enhancing these universities' e-learning offerings (Al-Hassan & Shukri, 2017). However, it should be pointed out that BL is still "a novel concept" to many Saudi universities and is still in its developmental stage (Alshathri & Male, 2015).

BL has been implemented in some Saudi universities for many reasons, including a need to update the educational system, growing competition among universities, burgeoning student populations, faculty retention concerns (Alshathri & Male, 2015). Additionally, BL implementation has become even more pressing for education to keep pace with "the needs of a modern world dominated by globalization and technology" (SEU, 2020b). Finally, issues of access and flexibility, cost-effectiveness (DDL, 2016b), and international growth for universities, such as Taibah University and George Washington University, are other factors that influence the adoption of BL (Barry & Alhazmi, 2018).

NeLC helps to equip universities with multimedia resources to facilitate the integration of BL as needed within the university (Alebaikan & Troudi, 2010a). The center's efforts have encouraged Saudi universities to establish online and blended technology to deliver learning for more students (Almonuf, 2017). One of the many initiatives that the center has adopted is a learning management system called Jusur, which is an Arabic word that means "a bridge." Jusur is a web-based application used to launch online courses in Arabic (Almalki, 2011; Almoslamani, 2018). Also, the MoE has entered a contract with Blackboard Inc. to provide a system to all government universities to use as a platform for traditional education, online, and BL classrooms (AlGhamdi & Bahaddad, 2018).

King Saud University (KSU) is the oldest institution of higher education in the KSA and the oldest among the Gulf countries. It was formerly known as Riyadh University and was established in 1957 (Weber, 2018). The Deanship of E-Transactions and Communications at KSU devised and implemented many initiatives to create learning and information technology across all the colleges (Aljaber, 2018). The first appearance of BL in a Saudi university occurred in 2007 in the College of Applied Studies and Community Services at KSU (Alebaikan & Troudi, 2010b). At this time, the college dubbed these courses "e-learning courses" (rather than BL courses) even though they were not conducted entirely online. The instructors combined face-to-face methods with online materials to reduce in-person meetings and used the Jusur LMS to deliver instructions to students online (Alebaikan & Troudi, 2010b).

King Khalid University (KKU) is in southwest Saudi Arabia and was founded in 1998. The university established an E-learning Deanship to provide up-to-date methods that improved access to learning by deploying technology in education (Al-Shahrani, 2016). The deanship has helped the university to introduce three levels of e-courses, which consist of a supportive e-learning level, a BL level, and a full e-learning level (Al-Shahrani, 2016). According to Alshahrani, in supportive e-learning, all classes are taken in physical classrooms and incorporate e-learning tools to facilitate learning. In a BL course, some face-to-face meetings in classrooms are superseded by e-learning resources and the percentage of e-learning hours is decided in advance at three levels, either 25%, 50%, or 75%. Finally, in full e-learning, all face-to-face meetings are superseded by e-learning tools with limited opportunity for in-person meetings and in-classroom final examinations (2015). KKU has also embraced a 5-year strategic plan to "promote the quality of education within the university" (Alshahrani, 2015). The plan seeks to

deliver 10% of the entire curriculum of e-courses in a blended way, which will inevitably

increase the demand for more BL courses in near future (Alebaikan, 2011).

Saudi Electronic University (SEU) was established in the capital city of Riyadh in 2011

with the aim of providing life-long education for students (SEU, 2020a). SEU started with three

branches in Jeddah, Dammam, and Medina; currently it has multiple campuses in 10 cities across

the KSA (SEU, 2020a). SEU is the only university that specializes in distance education that

grants both graduate and undergraduate online degree programs in different disciplines (SEU,

2020a). It is the Saudi university most concentrated on BL (Aljaber, 2018). SEU has even

implemented a BL environment for freshmen students who are in their introductory year

(Almoslamani, 2018). As is noted before, at SEU, BL consists of a traditional structure of face-

to-face meetings combined with online, electronic, computer-assisted activities (Aljaber, 2018)

that include direct lectures, simultaneous virtual lectures, and synchronous/asynchronous

electronic activities using Blackboard (SEU, 2020b). Approximately 25% of the class is

delivered face-to-face and 75% is delivered online (Almoslamani, 2018).

King Abdulaziz University (KAU) was named for the founder of Saudi Arabia, King

Abdulaziz Alsaud. It was established in 1967 by a group of businessmen as a private university,

then the university was converted to a public university to serve the needs of higher education in

the western region of the KSA (KAU, 2019a). It has grown to become a leading university in

many specialized fields, including ocean and sea sciences, aviation, nuclear engineering, medical

engineering, and minerals and oil resources (Aljaber, 2018). KAU is known as a prestigious

university, particularly due to its international standing in research, innovation, accreditations,

and rankings (The world university ranks, 2019). In 2020, it was ranked the No. 1 Arab

university by Times Higher Education (The world university ranks, 2019). Recently, KAU was

one of three universities chosen to be an independent university by the MoE, in line with the general policy of the state. The university began a year-long transitional period under a new university law to achieve financial and administrative independence (KAU, 2019b).

KAU has made efforts to create distance education systems to provide most bachelor, master, and doctorate programs with two instruction alternatives: distance learning or a composite of traditional and distance learning (Aljaber, 2018). Since 2014, the learning management system Blackboard has been available to deliver online content. Prior to using Blackboard, the university used the E- Learning Management Electronic System (EMES) for distance learning students (Kamal, 2013). The system was developed integrated with King Abdulaziz University's on Demand Registration System (ODUS) (Kamal, 2013). To facilitate the application of the latest technologies used in e-learning and distance education, the KAU Deanship of Distance Learning (DDL) was established in 2005 (DDL, 2019c). According to Al-Khalifa,

> DDL was designed to provide distance learning in the western region of the country. Its first academic year of operation was 2007–2008 and its programs are offered by the Faculty of Arts and Humanities and Faculty of Economics and Administration. These programs involve blended learning, the Virtual Class Room System (CENTRA), which provides lectures over the Internet and the E-Learning Management Electronic System (EMES) which facilitates interaction between students and faculty" (Al-Khalifa, 2010, p.751).

Even though BL is offered by some departments, the university has a plan for providing it across the entire university (DDL, 2016a).

In fact, there have been challenges with implementing changes based on technology within Saudi universities (Almonuf, 2017). According to Alebaikan and Troudi (2010a), Saudi university issues could be categorized into three major groups: culture, design, and demands on time. Faculty continue to resist technology in classrooms when it replaces traditional instruction. Furthermore, universities report that students do not take online classes as seriously as they do traditional classes, so universities would need to require a high level of self-discipline and responsiveness before further support can be established (Aldosemani et al., 2019; Alebaikan & Troudi, 2010a).

Moreover, a lack of support, training, and technical skills for both faculty and students lead to inadequate learning management systems, which causes a widespread sentiment that the LMS is complex and unreliable (Aldosemani et al., 2019; Alebaikan & Troudi, 2010a). Linking face-to-face and online delivery modes when designing BL courses requires more time and effort compared to traditional instruction, and this may influence the faculty's reluctance to change (Aldosemani et al., 2019).

Alebaikan (2010) examined the perceptions of Saudi female lecturers and students on BL courses at King Saud University. Alebaikan stated that BL courses encounter such issues as a deficiency of Internet labs on campus, lack of technical skills for both students and faculty, and increases in electronic plagiarism. Students and instructors may also misunderstand BL and consider it less effective than traditional classroom instruction or confuse it with purely online learning (Aldosemani et al., 2019; Barry & Alhazmi, 2018).

Despite these deterrents, Aldosemani et al. (2019) mentioned that faculty concerns could be solved if training is offered regularly, and workshops are provided sequentially to enhance their technical skills. Faculty members could be encouraged to adopt online learning by

incentives such as certificates, promotions, tenure, and other rewards (Owusu-Ansah et al., 2011). Barry and Alhazmi (2018) indicated that, to minimize challenges and maximize benefits, implementers of BL should be patient, flexible, committed, and capable of dealing with any challenges. Alnahdi (2019) concluded that the Saudi government is willing to integrate BL in the higher education system. To do this, it is important to have advanced ICT as well as training for using ICT more effectively for both students and academic staff. At the same time, Saudi institutions of higher education need flexible organizational structures, adequate resources, clear policy, and sufficient supervision and evaluation to integrate effective BL (Almalki, 2011) as well as more time and effort spent in designing, supporting, and training faculty (Aldosemani et al., 2019).

Theoretical Foundation of the Study

To better understand how to facilitate the implementation of BL as a new educational technology innovation, two models need to be examined: Rogers's Diffusion of Innovation (DoI) and Ely's Eight Conditions for Technological Change. These models are distinguished from one another in few key ways: define its elements, and describe how it can be used to understand the implementation of BL.

First, it is useful to differentiate between innovation adoption and implementation. Innovation is defined as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12). Building on this definition, innovation adoption is defined as the decision to utilize an innovation (Klein & Knight, 2005). Adoption refers to the initial or minimal level of behavioral utilization of an innovation (Rogers, 2003).

On the other hand, innovation implementation is defined as "the transition period during which [individuals] ideally become increasingly skillful, consistent, and committed in their use

of an innovation" (Klein & Knight, 2005, p.243). Implementation is a crucial gateway between making the decision to adopt an innovation and practicing the innovation within an institution (Klein & Sorra, 1996). Generally, adoption is considerably easier though sometimes more expensive than implementation (Klein & Knight, 2005).

Rogers's Diffusion of Innovation (DoI)

It was introduced by Everett Rogers in his first publication in 1962. DoI is considered as a framework on the diffusion of agricultural innovations and the change that occurred from the adoption or the rejection of an innovation (Rogers, 2003). It is appropriate to explain the processes of adopting innovations at institutional and individual levels.

Diffusion, according to Rogers (2003) is the "process by which an innovation is communicated through certain channels over time among the members of a social system" (p.5).

In DoI, Rogers (2003) discussed four elements that play a fundamental part in the success of new ideas being adopted in the education process: innovation, communication channels, time, and a social system (see Table 2).

Table 2

Descriptions of Four Major Components in the Diffusion of Innovations

Elements	Descriptions
▪ Innovation	If an idea appears to be new to a person and creates uncertainty in their mind, it is likely a technological innovation.
▪ Communication channels	The process by which a person may decrease a specified quantity of uncertainty in their thoughts by gaining information from two channels: mass media and interpersonal interactions.
▪ Time	The process carried out to decide the diffusion of innovation; the comparative time it takes, whether with haste or delay, for a person to adopt the innovative idea;

		and an innovation's relative speed of adoption by members in a system.
▪ Social system		"A set of interrelated units" that an innovation diffuses through to accomplish shared purpose.

Note. Adapted from Rogers, E. (2003). *Diffusion of Innovations*, New York: Free Press.

At an institutional level, DoI outlines a sequence of five general stages in the innovation process. These stages are divided into two major stages: initiation and implementation. Each stage is then divided into substages (see Table 3).

However, Rogers (2003) noted the innovation process at the institutional level is more complex than the innovation adoption process at the individual level.

Table 3

Descriptions of Five Stages in the Innovation Process at Institutional Level

	Stages	Descriptions
1. Initiation	▪ Agenda setting	Identifying institutional issues that need for innovation.
	▪ Matching	Identifying an innovation that addresses the institutional issues.
2. Implementation	▪ Redefining/Restructuring	Modifying and reinventing the innovation to fit the institution & Reshaping the institutional structure.
	▪ Clarifying	Defining clear relationship between the institution & the innovation.
	▪ Routinizing	Making the innovation ongoing part of the institution's activities.

Note. Adapted from Rogers, E. (2003). *Diffusion of Innovations*, New York: Free Press.

Rogers (2003) provides an organizational innovativeness model (structure characteristics and organization innovativeness), innovativeness of an institution according to Rogers (2003), depends on variables that positively or negatively influence the institution such as management

characteristics and attitudes toward change, internal characteristics of institutional structure, and external characteristics of the institution (see Table 4) (see Figure 3). According to Rogers (2003), these institutional structure variables may be associated with the innovation in the same side within the initiation stage of the innovation process, and in the other side within the implementation stage. For example, lower level of centralization, upper level of institutional complexity, and lower level of formalization encourage innovation in the initiation stage, but inhibit implementation (Rogers, 2003).

Table 4

Descriptions of Independent Variables Related to Institutional Innovativeness

	Stages	Descriptions
1. Individual (Leader) Characteristics	▪ Attitude Toward Change (+)	It has positive influence when an institution's leader has positive attitude toward change.
2. Internal Characteristics of Institutional Structure	▪ Centralization (−)	It has a negative influence when authority in an institution is control by the hands of limited number of certain individuals.
	▪ Complexity (+)	It has a positive influence when an institution's members have considerable degree of knowledge and expertise.
	▪ Formalization (−)	It has a negative influence when the institution stresses its members accepting rules and procedures in their role performance.
	▪ Interconnectedness (+)	It has a positive influence when the institution's members are connected by interpersonal networks.
	▪ Organizational Slack (+)	

		It has a positive influence when the institution has more resources than those required for its daily operations.
	▪ Size (+)	It has a positive influence when the institution is large since larger institutions are more innovative.
3. External Characteristics of Institutional	▪ System Openness	It has a positive influence when the institution open itself to new ideas that could solve a problem compared to other institutions.

Note. Adapted from Rogers, E. (2003). *Diffusion of Innovations*, New York: Free Press.

Figure 4

Independent Variables Related to Institutional Innovativeness

Independent Variables **Dependent Variable**

Individual (Leader) Characteristics
1. Attitude Toward Change (+)

Internal Characteristics of Institutional Structure
1. Centralization (–)
2. Complexity (+)
3. Formalization (–)
4. Interconnectedness (+)
5. Organizational Slack (+)
6. Size (+)

External Characteristics of Institutional
1. System Openness

Institutional Innovativeness

(+) is positive influence
(–) is negative influence
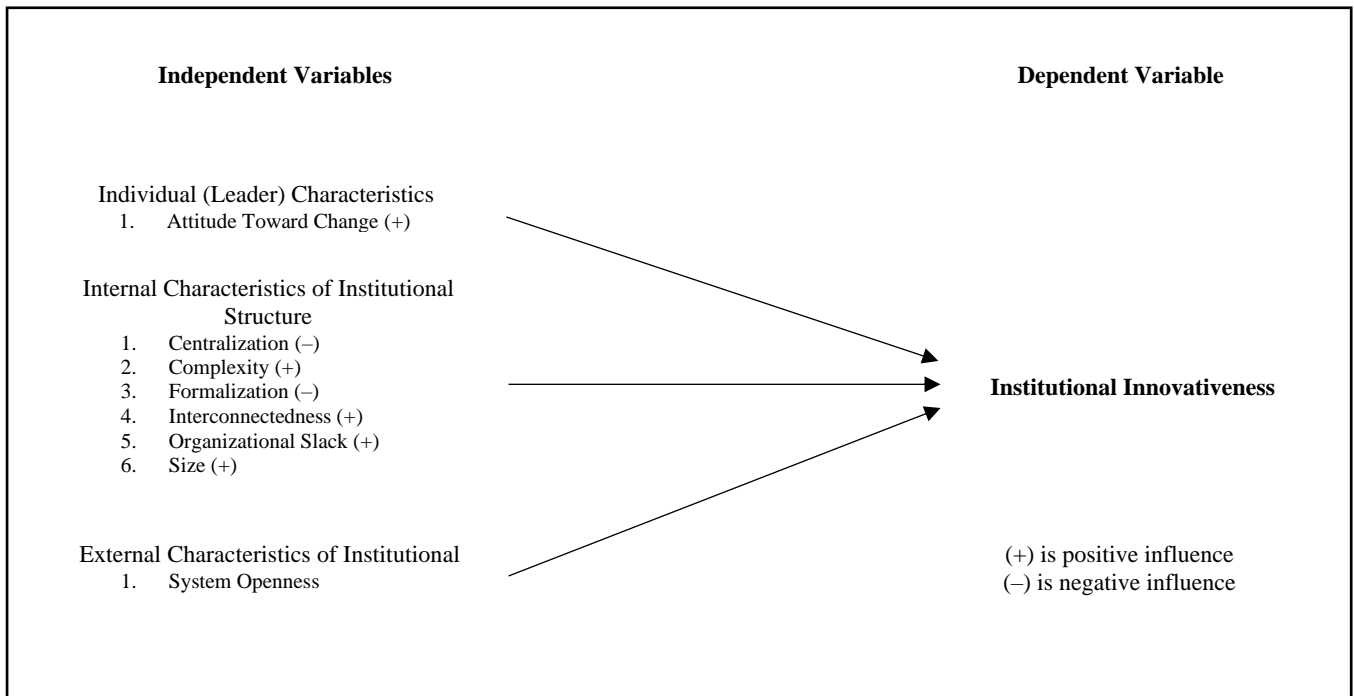
Source: Adapted from Rogers (2003, p. 411)

At an individual level, Rogers (2003) provides a model of the innovation decision process that consists of five distinct stages; individuals and groups go through all stages to reach

consensus about whether to adopt or reject an innovation. These stages are knowledge,

persuasion, decision, implementation, and confirmation (see Table 5).

Table 5

Descriptions of Five Stages in the Innovation-Decision Process at an Individual Level

Stages	Descriptions
▪ Knowledge	Occurs when the individual gets exposed to an innovation's existence where they understand how it works.
▪ Persuasion	Occurs when the individual forms a favorable or unfavorable attitude toward the innovation.
▪ Decision	Occurs when the individual engages in activities that lead to a choice to adopt or reject the innovation.
▪ Implementation	Occurs when the individual puts the innovation into use.
▪ Confirmation	Occurs when the individual seeks reinforcement of an innovation-decision already made or even rejects the innovation due to the conflict.

Note. Adapted from Rogers, E. (2003). Diffusion of Innovations, New York: Free Press.

Based on the rate of adoption of the social system, Rogers (2003) also sorted innovation

adopters according to these categories: innovators, early adopters, early majority, late majority,

and laggards (see Table 6).

Table 6

Descriptions of the Five Groups of Innovation Adopters

Category	Descriptions
▪ Innovators "Venturesome" (2.5%)	They are the first to try out something new. They should have the ability to deal with a higher degree of uncertainty about an innovation at the moment of adoption.
▪ Early adopters "Respect" (13.5%)	They are considered influential by other colleagues of a community organization. They are respected by the colleagues of the organization. They reduce uncertainty about the innovation by adopting it.
▪ Early majority "Deliberate" (34%)	They adopt the innovation just before the average colleague of a community organization. They do not make the first move to

		completely adopt the innovation, but they fully adopt it after deliberating for some time.
▪	Late majority "Skeptical" (34%)	They adopt the innovation just after the average colleague of a community organization. They are not always prepared to adopt. Any sense of uncertainty must be eliminated before they feel it is safe to adopt the innovation.
▪	Laggards "Traditional" (16%)	They are the last in a community organization to adopt the innovation. They are likely to be doubtful about innovative ideas. They must be certain that the innovation will not collapse before they can adopt it.

Note. Adapted from Rogers, E. (2003). Diffusion of Innovations, New York: Free Press.

The implementation of BL at the Saudi education system involves individuals and institutional entities. The purpose for utilizing DoI is to clarify factors for consideration related to institutions and faculty characteristics and ascertain whether an innovation will be diffused in institutions since the adoption of BL is considered at the early stages of implementation particularly in KAU.

However, adoption has no significance if it is not followed by implementation that puts the process into practice and goes beyond the point of adoption (Ely, 1999). At the same time, implementation requires a previous adoption stage that is "a decision" made by authoritative administrators at an institution as to whether the users within the institution will utilize the innovation. Even if BL is adopted by administrators, the success and failure of implementation depend on whether users utilize the innovation frequently, consistently, and assiduously in order to maximize the benefits (Klein & Sorra, 1996).

Ely's Conditions of Change model

It was theorized by Donald Ely in consideration of libraries in 1976 (Ely, 1990). These conditions are considered a baseline to facilitate the implementation of technological inventions in a diversity of educational contexts (Ely, 1990). Ely's work has built upon Rogers's Diffusion of Innovation approach in the field of educational technology implementation. Ely's (1990,

1999) eight conditions are: dissatisfaction, existence knowledge and skills, availability of

resources, availability of time, existence of rewards or incentives, encouragement of

participation, commitment by those who are involved, and evidence of leadership. For the

operational definitions (see Table 7).

Table 7

Descriptions of Ely's Eight Conditions for Technological Change

Conditions	Descriptions
▪ Dissatisfaction with the status quo	Individuals are not content with current things that need to change. Also, individuals seek to improve them.
▪ Existence of knowledge and skills	Individuals must have skills and knowledge to use the innovation.
▪ Availability of resources	To make the change, tools and required resources should be accessible. Resources can include financial resources, hardware and/or software, support, and other relevant materials.
▪ Availability of time	Individuals should have enough time to learn, use, and reflect upon the innovation. Company time and paid time should be provided by the institution where the innovation will be implemented.
▪ Rewards or incentives exist	Rewards vary from additional resources to personal assistance. However intrinsic or extrinsic incentives and rewards should exist in some form.
▪ Participation	Participation includes direct participation when possible, shared decision-making and communication among all those involved in the process.
▪ Commitment	Commitment indicates that the innovation should be supported by key players in the institutions such as a leadership or the board of directors.
▪ Leadership	Two branches of leadership are necessary: institution leaders and project leaders. Leadership should provide encouragement, support, motivation, and inspiration.

Note. Adapted from Ely, D. P. (1999). Conditions that facilitate the implementation of educational

technology innovations. Educational Technology, 39(6), 23-27.

The purpose of mentioning Ely's eight conditions is to utilize them as a guide for evaluating factors and exploring more related factors that facilitate the implementation of BL. Rogers's work in DoI focuses on the adoption process, which is the initial decision-making stage. Ely's work on the conditions that necessary focuses on the implementation process and pays extra attention to factors that facilitate use the innovation. DoI and Ely's conditions are different but complementary. By connecting both works, DoI facilitates understanding of the disparate characteristics of institutions that adopt BL. Ely's conditions elaborates on the factors needed to successfully implement BL. A review of this literature can help predict potential factors, which might ultimately assist or influence Saudi universities in the implementation of BL.

Discussion

As indicated by the initial review of literature, researchers have suggested that BL holds promise comparable to fully online courses and face-to-face courses (Allen et al., 2007; Graham, 2006; Moskal et al., 2013). BL has been utilized in both corporate and higher education spheres, in all aspects of education (Allen et al., 2007). Leaders in campus-based institutions of higher education are driven to offer BL by different motives, such as meeting the demands of 21st century students for accessibility and flexibility, competition in international markets, cost effectiveness, or integrating technology into the classroom (Al-Sarrani, 2010; Adekola et al., 2017; Aldosemani et al., 2019; Alebaikan, 2010).

Despite BL is becoming increasingly popular and some positive effects have been seen, problems are inherent in studies related to BL implementation. It is troubled with concerns of non-existent principles that govern the implementation of this mixing of delivery approaches (Graham, 2013; Oliver & Trigwell, 2005). Few studies have identified and provided details about factors that should be recognized with respect to the successful adoption and implementation of BL (Graham et al., 2013).

A review of this literature, along with the theoretical foundation of Rogers and Ely, helped predict potential institutional factors. These factors, along with appropriately combining the social engagement of face-to-face learning and the flexibility and convenience of online learning, can truly offer the "best of both worlds" in a BL environment (Cavanagh et al., 2017, p. 118). Further examination of the research is needed to identify these institutional factors related to overall implementation of BL by combining the disparate results from different empirical studies, which might ultimately assist or influence Saudi universities in their implementation of BL.

Chapter Three: Research Methodology

This chapter discusses the research methodology employed in the current study and describes how an integrative literature review was conducted. This study utilizes an integrative literature review approach that is based on five stages. These five stages allow the researcher to integrate (Compare and Contrast) what others have done and said regarding factors that should be considered for BL implementation in higher education. Using the results of this review, a conceptual classification will be developed and presented to summarize the factors that guide administrators in implementing BL in their universities. The factors will be identified and examined through an integrative review of the literature that specifically addresses BL implementation in higher education. A literature search revealed that little research has been conducted for the purpose of guiding Saudi universities to adopt and implement BL. Thus, the current study attempts to narrow the gap.

Study Design

Background of Integrative Literature Review (ILR)

This study will employ an ILR. The ILR was developed initially through behavioral (Cooper, 1984) and health-care research (Whittemore, 2005), and is now used in a variety of disciplines. The ILR is the most comprehensive type of literature review, covering one or more methodological, empirical, or theoretical bodies of literature depending on the purpose of the research (Whittemore, 2005). ILR is, "a form of research that reviews, critiques and synthesizes representative literature on a topic in an integrated way such that new frameworks and perspectives on the topic are generated" (Torraco, 2016a, p. 404). Cooper (1982) described ILR as, "the synthesis of separate empirical findings into a coherent whole" (p. 291). Terms closely associated with ILR include "literature review," "meta-analysis review," and "systematic review"

(Russell, 2005). According to Cooper (1982), "literature review" covers all these terms, and some are broader or narrower than others. Winchester and Salji (2016) defined a literature review as, "an evidence-based, in-depth analysis of a subject by a critical appraisal of the current knowledge in the subject area" (p. 308). Meta-analysis review is, "a distinctive method of reviewing the literature that uses numbers and statistics to reveal patterns of causal relationships across empirical studies of a given topic" (Torraco, 2016b, p. 63), whereas systematic review is about, "focusing on empirical research findings and have the goal of integrating past research by drawing overall conclusions (generalizations) from many separate investigations that address identical or related hypotheses" (Cooper, 2017, p. 7). The integrative review, meta-analysis review, or systematic review has a distinct definition, purpose, scope, sampling frame, and analysis (Whittemore, 2005). According to Cooper's (1988) taxonomy, all literature reviews can be categorized based on their focus, goals, perspective, coverage, organization, and audience (p. 109) (see Table 8).

Table 8

Taxonomy of Literature Reviews

Characteristic	Categories
▪ Focus	Research finding
	Research methods
	Theories
	Practices or applications
▪ Goal	Integration:
	▪ Generalization
	▪ Conflict resolution
	▪ Linguistic bridge building
	Criticism
	Identification of central issues
▪ Perspective	Neutral representation
	Espousal of position
▪ Coverage	Exhaustive of all studies

		Exhaustive with selective citations
		Representative citations
		Central or pivotal citations
▪ Organization		Historical
		Conceptual
		Methodological
		Specialized scholars
▪ Audience		General scholars
		Practitioners or policy makers
		General public

Note. Adapted from Cooper, H. M. (1988). Organizing knowledge syntheses: a taxonomy of literature reviews. *Knowledge of Society*, *1*(1), 104–126.

Benefits of ILR

Properly done ILRs can be employed for a wide range of purposes such as to review, update, or critique a concept, theory development, methodology problems, etc. ILRs can be used to synthesize a topic previously reviewed in the literature, to reconceptualize a topic, to infer generalizations on a topic, to expand on the topic over an extended period, and to determine applicability to practice and policies as well as future directions for research (Cooper, 1988; Torraco, 2016b; Whittemore & Knafl, 2005). An integrative review can make crucial contributions to concept development and generate direct influences on future research practice implications (Broome, 2000).

Limitations of ILR

The inclusion of multiple research designs can complicate analysis, and the complexity of these research designs can lead to a deficit of rigor and increase in error and bias (Whittemore, 2005; Whittemore & Knafl, 2005). Methods developed to collect, analyze, synthesize, and draw conclusions from data, such as literature search strategies, inclusion and exclusion criteria, and so on, continue to be poorly formulated (Whittemore & Knafl, 2005).

Rationale of ILR in this study

The integrative literature review technique was selected for this study. The significance of this technique is to uncover rich detail on factors surrounding the implementation of BL in institutions of higher education. Due to the new emergence of blended learning in Saudi Arabia, there is currently very little existing research that addresses the implementation of BL at the institutional level. Therefore, an integrative literature review is an appropriate means by which to investigate the "what" and "how" research questions. The ILR allows the researcher to synthesize factors to be considered for the purpose of successful implementation of BL from other international research studies.

Five Stages of ILR

ILR as a research process involves five stages: problem identification, data collection, data evaluation, data analysis and interpretation, and presentation of results (Cooper, 1984; Whittemore & Knafl, 2005). A potential for bias, error, and lack of rigor exists at any stage, so paying attention to the quality of the studies is required at all stages (Whittemore & Knafl, 2005).

Stage 1, or problem identification, involves a clear identification of the problem, the conceptual and operational definitions of the variables to be examined, and the purpose and rationale of the study to understand the research focus and boundaries (Cooper, 2017; Whittemore & Knafl, 2005).

Stage 2, the data collection, or literature search, involves identifying the target and accessible population for the study and creating well-defined search strategies such as search terms, the databases and journals used, and inclusion and exclusion criteria for identifying relevant studies (Cooper, 2017; Whittemore & Knafl, 2005). A comprehensive search with at

least two complementary search strategies is important to enhance the rigor of a review and minimize biases (Cooper, 2017; Whittemore & Knafl, 2005).

Stage 3, data evaluation, involves making a judgment about the available data on whether study data are valid enough to be added as part of the findings (Cooper, 2017). There is no specific method or evaluation tool to judge the quality of data because of the inclusion of diverse methodologies in ILR (Whittemore & Knafl, 2005). However, in questioning the trustworthiness of data, the criteria could be based on the reliability and internal validity of all relevant studies (Whittemore, 2005), as well as the degree to which the study's design and implementation match the inferences that can be drawn from the study (Cooper, 2017). For example, researchers can review the methodological features and findings of each study to see whether the findings are too different from others and whether data recording irrelevancies or errors exist (Cooper, 1984).

Stage 4, data analysis and interpretation, involves summarizing and integrating the data to build a unified picture of the research problem (Cooper, 2017). Particularly, data analysis involves, "working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others" (Bogdan & Biklen, 2006, p. 159). Data interpretation involves applying decision principles to distinguish systematic data patterns from, "noise or chance fluctuation" (Cooper, 2017, p. 190). Because there is no obligation to apply any standard analysis and interpretation techniques in synthesizing data, researchers may use inexplicit principles of inference (Cooper, 1982). The problem can be addressed by introducing quantitative methods into the synthesizing process (Copper, 2017). Whittemore (2005) argued that the strategies and procedures of the data analysis stage vary in accordance with the purpose and the type of ILR.

The main goal of analyzing data is to summarize and describe it in a way that ensures valid interpretation (Cooper, 2017).

Stage 5, presentation of results, involves creating a public document that represents a comprehensive understanding about the research topic as a final task that completes the researcher's effort (Cooper, 2017). The coding forms are eventually transformed into a cohesive public document, providing a synthesis of the exhaustive literature (Cooper, 2017). The results from completing all stages of ILR reflect the depth and breadth of the topic examined, new understanding of the area of concern, and implications for practice, research, and policy (Whittemore & Knafl, 2005). The conclusions from an ILR may be reported in table or graphical form (Whittemore & Knafl, 2005), but there is no single approved guideline for reporting ILR (Cooper, 1982). Torraco (2016a) suggested five synthesis formats for ILR: a research agenda, a taxonomy or other conceptual classification of constructs, alternative models or conceptual frameworks, meta-analysis, and metatheory.

Procedures of Integrative Literature Review in this Study

Because ILR is suitable for exploring dynamic or new topics in various fields (Torraco, 2016a) such as BL, it will be utilized to obtain knowledge of the key factors associated with implementing BL in published articles. The current study utilizes the ILR based on the five stages developed by Cooper (1984) and Whittemore & Knafl (2005) (see Figure 5). It focuses on identifying, synthesizing, and integrating factors influencing the implementation of BL (Cooper, 1984; Whittemore & Knafl, 2005).

Figure 5

Stages of Research Design for this Study
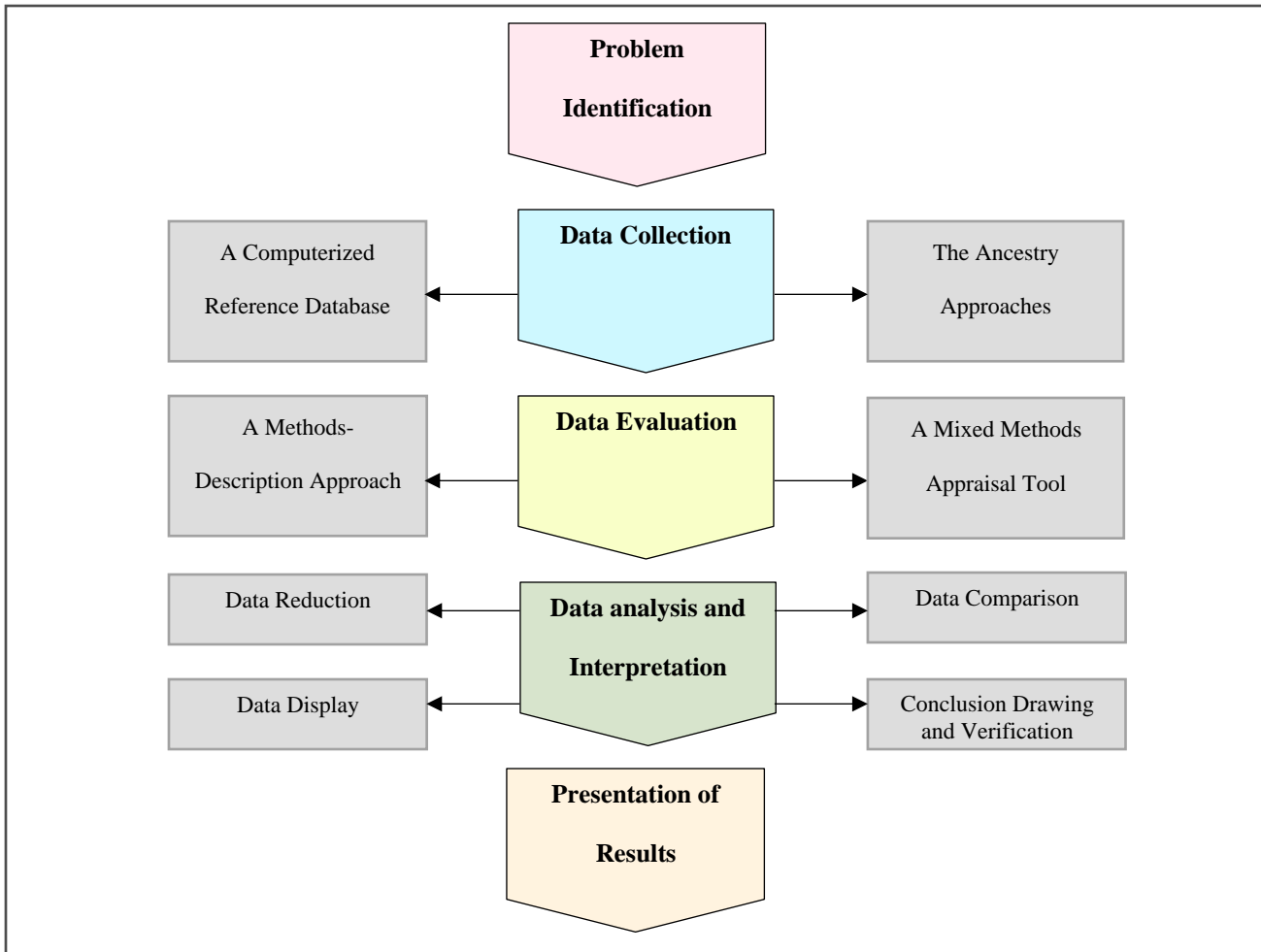
Problem Identification

While there has been growth in implementing BL in different higher education

institutions, only a few studies provide standard guidance for institutions that are looking to

implement BL (Mirriahi et al., 2015; Potter et al., 2014). On the one hand, BL is in the early

stages of implementation in Saudi Arabia, and still lacks clearly guiding principles (Alshathri &

Male, 2015; Al-Hasan & Shukri, 2017). Consequently, some of the impediments have not been

completely addressed or some of the assistances have been disregarded (Alshathri & Male,

2015). The first appearance of BL was more than a decade ago in Saudi higher education at King Saud University (Alebaikan & Troudi, 2010b). However, there is still a need for BL to be considered and explored since it was not accepted and implemented on a large scale in other communities outside of KSU. Thus, responsive best practices have not been thoroughly considered, and few studies examine BL at Saudi universities (Aldosemani et al., 2019).

On the other hand, numerous institutions have offered BL courses that have been piloted or adopted by faculty, although the institutions themselves have not officially approved them (Blanchette, 2016; Graham et al., 2013). Indeed, the current body of literature indicates specific initiatives rather than systematic and strategic implementation of BL at the institutional level (Wang & Han, 2017). Furthermore, most BL research studies have been conducted at a course or program level, with little or no engagement by entire academic institutions (Porter et al., 2014). There is very little research has been concentrated on implementation stage at the institutional level (Graham et al., 2013). Therefore, there is a gap to be bridged between BL research and practices at the institutional level.

In general, when institutions recognize the need to transition towards another learning delivery mode, the transformative potential should be explored first. This should occur prior to making the transition to increase success (Singleton, 2012). Institutions should seek to recognize how they can best utilize both face-to-face and online learning (Garrison & Kanuka, 2004). In particular, the implementation of BL courses and programs at higher education institutions is a complex task that does not always happen smoothly or successfully (Kastner, 2019; Picciano, 2014). Transitioning to this delivery mode with unreconciled and opposing challenges makes it difficult for practitioners to effectively implement BL. Thus, the time is right to look at the guiding factors that may assist institutions attempting to transition to BL on their campuses.

With this in mind, a comprehensive exploration of success factors, and a clear idea about the scope of potential challenges can ensure a more fruitful move to BL. Consequently, a clear conceptualization of BL factors that facilitate implementation as a delivery medium is required. This study seeks to provide evidence-based guidelines to better inform those implementing BL within an institution of higher education.

Data Collection

The second step in ILR is to describe what procedures will be used to seek out relevant research studies. The target literature for the current study includes all previous studies related to higher education, and that address the research problem. In addition to this, the amount of literature accessed was limited to obtainable study reports. The literature search inclusion criteria for collecting data were based on the need to obtain empirical studies employing qualitative, quantitative, and mixed methodologies. Qualitative studies included ethnography, narrative research, phenomenology, grounded theory, and case studies (Creswell & Poth, 2018). Experimental and nonexperimental quantitative studies were also included (Howell, 2013). All studies were peer reviewed, published in academic journals, written in English, and published between 2000 and 2020. All studies had the central topic of BL, defined it as a combination of face-to-face and online learning, and investigated the implementational practices associated with BL in higher education settings.

Publications were excluded if they were dated prior to January 2000 and after August 2020, not peer-reviewed (editorials, bulletins, government reports, conference papers, and book chapters), formatted as a literature review/gray literature (i.e. abstracts, proceedings, and case reports), not focused on blended learning, not publicly available or archived, in languages other than English, secondary research studies, comparison studies, studies addressing the impact of

BL on student achievement or academic performance, studies conducted in K-12 school settings, or if studies were concentrated solely on the face-to-face or online portions of BL.

The literature search strategies involved two of the complementary approaches recommended by Cooper (2017) and Whittemore and Knafl (2005). These two search approaches were used to ensure retrieval of the most extensive body of literature that is relevant to BL. The first approach to the literature search began with a computerized reference database using the indexing search term, "Blended Learning" OR "Hybrid Learning" OR "Blended Instruction" OR "Hybrid Instruction" which could be found in a research article's title, abstract, or author-specified keywords in four respectable databases including Education Research Complete, Education Resource Information Center (ERIC), JSTOR, and ProQuest Dissertation and Theses (see Appendix A). Reference databases, according to Cooper (2017), "are indexing services maintained by both private and public organizations associated with social science (or other) disciplines" (p. 93). These online reference databases were accessed via Virginia Tech's university library, https://lib.vt.edu/.

The second approach to finding literature involved the ancestry approach, which is also known as the backward search, or footnote chasing. This approach involves the manual examination of an article's reference lists to obtain additional articles that may be relevant to the search (Cooper, 2017).

The selection of research studies for this review followed the protocol and steps in the Preferred-Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidance. According to Moher et al. (2009), the purpose of the PRISMA is to ensure quality and rigor as well as to enhance the reporting of systematic reviews and meta-analyses. The PRISMA statement consists of a 27-item checklist and a 4-phase flow diagram. The 4-phases of

identification, screening, eligibility, and inclusion may be applied as criteria when reviewing a report (see Appendix B). The checklist includes 27 items that fall under the scope of a topic such as title, abstract, introduction, methods, results, discussion, and funding (Moher et al., 2009). For the purpose of the selection phase, the 4-phase flow diagram was used. The diagram was helpful in providing a way to visually display and critique review findings by identifying and screening potentially eligible studies that were included in the final number.

Initially, all databases together yielded over 20,000 records that were identified using the first search strategy. The end of all databases search was the first week of August 2020. In this step (identification): the indexing search term, "Blended Learning" or "Hybrid Learning" or "Blended Instruction" or "Hybrid Instruction" was used via each search engine from the database. In the second step (screening), 4,747 articles were retrieved after database filters relevant to the inclusion criteria were applied. Filters included criteria such as peer-reviewed journals, language (English), availability (full text), specific range of date (from 2000 to 2020), subject (higher education), and availability of references. In the third step (eligibility), the number of records was reduced to 172 after duplicates were removed and full text reviewing (title, abstract, keywords, and descriptors were assessed for each article to determine appropriateness for inclusion in the study). In the last step (inclusion), when there was doubt about an article's relevance, the content of the article was read again to check for an overall fit with the inclusion criteria. For an overview of the computerized reference database approach based on the PRISMA flow diagram (see Figure 6).

Ultimately, 30 studies were retrieved from the computer databases. Following the first approach, the second strategy or "ancestry approach" was applied. This involved the manual examination of the reference lists for 30 studies. Through the ancestry approach, 6 additional

studies of interest were identified. In total, 36 studies were selected for the next evaluation phase. For an overview of the number of studies (see Appendix C).

Data Evaluation

Data evaluation is a critical phase in the integrative literature review method where diverse primary sources are included, increasing the complexity (Whittemore & Knafl, 2005). These diverse sources may be used to evaluate quality in sources that represent outliers. In this study, a set of criteria were considered and discussed. These included: study relevance, quality of methodology, findings, and strengths and limitations. Two strategies were used: the methods-description approach and the MMAT.

A methods-description approach was used to evaluate the study design and data analysis (Cooper, 1984, 2017). The methods-description approach involves describing the characteristics of each study as described by the primary researchers in their reports (Cooper, 2017). Some characteristics of each study were coded into Microsoft Office Word, including the study author, aim, design, major findings, and strengths and limitations.

The categories listed above were low-inference approaches, which only required researchers to locate desired information and record it in the coding sheet (Cooper, 2017). A Mixed Methods Appraisal Tool (MMAT) was also used to appraise studies. The MMAT is a critical appraisal tool designed for systematic mixed-study reviews that include qualitative, quantitative, and mixed methods studies (Hong et al., 2018). It describes the quality of studies in five categories: qualitative research, randomized controlled trials, non-randomized studies, quantitative descriptive studies, and mixed-methods studies (Hong et al., 2018). This tool comes with a user guide that is comprised of two parts: a checklist (Part I) and an explanation of the criteria (Part II).

Figure 6

An Overview of the Computerized Reference Database Approach Based on the PRISMA Flow
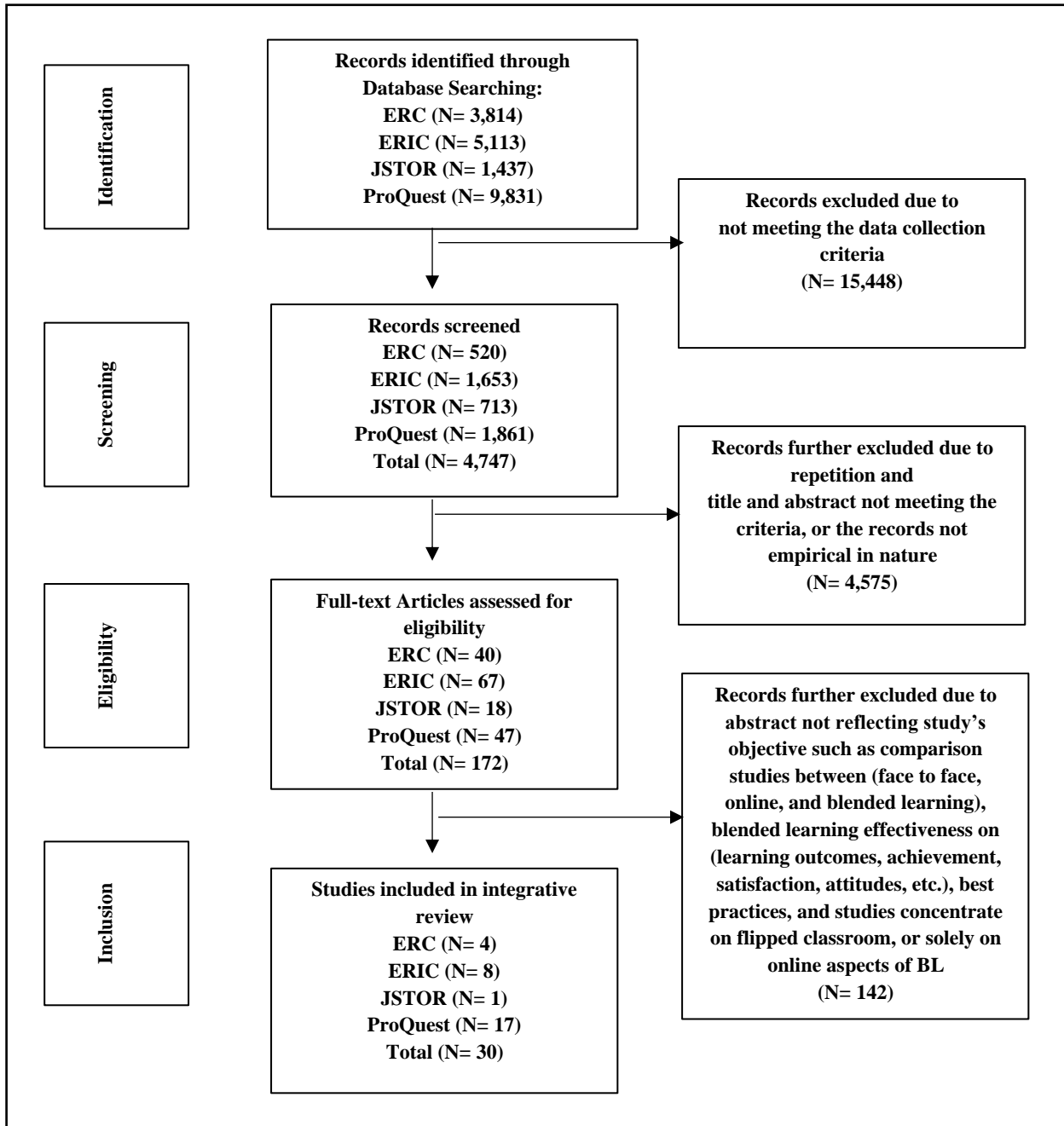
Diagram

Source: adapted from PRISMA Flow Diagram (Moher et al., 2009)

Part I involves two screening questions and 20 items across five study categories: qualitative studies (five items), quantitative randomized controlled trials (five items), quantitative non-randomized (five items), quantitative descriptive (five items), and mixed methods (five items) (see Appendix D). Starting with Part I, there are two questions used to screen studies. If the response to either of these questions is, "No" or "Can't tell," it indicates that the study is not an empirical study and should be excluded. Next, for each included study, there are five design-related questions with three types of responses: Yes, No, or Can't tell.

Part II involves indicators for some pervious criteria. However, these indicators are not comprehensive, and researchers may consider what is relevant for their field (Hong et al., 2018). The purpose of using this tool is that the content validity, reliability, and efficiency of the MMAT is supported by previous research (Hong et al., 2017). It covers all types of research methodology obtained from the previous phase of data collection. It does not involve multiple appraisals for the original information, lowering the possibility for ambiguous meanings. At the end of this stage, each primary article was reduced to a set of characteristics on a coding sheet, which served as a starting point for analysis in the next stage (see Appendix E).

Data Analysis and Interpretation

Based on the recommendations of Cooper (1998), the extracted data were ordered, categorized, and summarized to present a descriptive summary of the selected studies. This summary was used to draw conclusions that would answer the research questions. According to Whittemore and Knafl (2005), strategies for data analysis conducted with ILR are often difficult and prone to error, so the strategies for data analysis should be mentioned explicitly before undertaking the process.

A qualitative analysis was employed with attention paid to forming an unbiased interpretation of individual studies. The full primary studies were read to extract data manually on paper regarding possible institutional factors that could influence the implementation of BL. Next, the extracted data from each individual study were compared item by item with those of all other studies to identify similarities that would categorize and group them together (Whittemore & Knafl, 2005).

The process of qualitative analysis was implemented using a constant-comparison method. This technique is a procedure whereby the categories within the data are contrasted constantly until data saturation is reached (Cohen et al., 2018). In the constant comparison method, new data is compared with existing data, and categories aim to achieve a perfect complement (Cohen et al., 2018). According to Cohen et al. (2018), through constant comparison, the data is compared through a whole set of, "situations, times, groups of people, and through a range of methods" (p. 719).

In this study, the constant-comparison method was utilized with different data from different methodologies, and was divided into four steps: data reduction, data display, data comparison, and conclusion drawing and verification (Whittemore & Knafl, 2005). With this systemic approach, each step builds upon the previous one to produce "higher-order clusters" (Whittemore & Knafl, 2005).

Data Reduction. Data reduction is the process of classifying and pulling up data from chosen primary studies into a reasonable format that allows for clarification, abstraction, concentration, and management. There are many ways to classify data that may be based on chronology, settings, sample characteristics, etc. (Whittemore & Knafl, 2005).

In this study, the primary studies were organized into different categories based on the problem identification and research questions. Initial categories used to identify the overall characteristics of studies were: (1) article title, (2) author(s), (3) year, (4) country, and (5) participants. To explore the first research question, (6) examples of sentences, (7) codes, (8) themes (possible influential factors) were also explored.

Data Display. Data display is the process of developing a form to display all of the coded data from each primary study by category. This display may be in the form of, "matrices, graphs, charts, or networks" (Whittemore & Knafl, 2005). The goal of data display is to reinforce the visualization of scheme, themes, or interrelationships in and across the primary studies, and to serve as a starting point for further interpretation (Whittemore & Knafl, 2005). Each study was simplified and abstracted into a manageable table hosted on an Excel sheet for further interpretation.

Data Comparison. Data comparison is an iterative process of examining extracted data (Whittemore & Knafl, 2005). The aim of this process is to recognize patterns, relationships, or themes across the data display (Whittemore & Knafl, 2005). Next, similar variables are grouped near one another.

In this study, the iterative comparison was conducted across the extracted data to identify commonalities and differences among themes (possible influential factors affecting the implementation of BL in higher education). Data saturation was achieved somewhere in the middle of the data analysis process. However, all research studies were analyzed to completion. The complete data were converted into 23 emerging themes (factors) based upon several iterative comparisons across primary data sources. These factors were 1) BL Advocacy, 2) BL Definition, 3) BL Plan, 4) BL Policies, 5) BL Programs/Courses, 6) BL Purpose, 7) BL Vision, 8)

Collaboration, 9) Commitment, 10) Communication, 11) Evaluation, 12) Faculty and Students Existing ICT Skills and Experience, 13) Faculty and Students Perceptions, 14) Faculty and Students Readiness, 15) Faculty and Students Support, 16) Funds, 17) Incentives and Rewards, 18) Infrastructure and Resources, 19) Leadership, 20) Professional Development, 21) Professional Staff Assistance, 22) Service, 23) Time. In the process of exploring answers to other research questions regarding alignment with Rogers's diffusion of innovation, and Ely's eight conditions, the given themes (factors) were constantly compared with the work of Rogers and Ely.

       Conclusion Drawing and Verification. Conclusion drawing and verification is the final process of data analysis, and focuses on transferring patterns, relationships, or themes from interpretive description into elevated levels of abstraction (Whittemore & Knafl, 2005). The aim of this process is to subsume all particulars such as identified patterns, relationships, or themes into an integrated general synthesis or summation (Whittemore & Knafl, 2005). Since data will be conceptualized at elevated levels of abstraction, each primary source should be examined to confirm that the new conceptualization is consistent with the primary sources (Whittemore & Knafl, 2005).

       In this study, data on the coding sheet was further extracted to higher levels of abstraction. Commonalities and differences among themes (factors) were analyzed and elaborated in the table. To verify the synthesis or summation, each theme (factor) was reviewed to ensure accuracy, to confirm that there had been no misinterpretation, and to confirm that the summation was congruent with the initially selected sources.

Presentation of Results

The final phase of the study involves the presentation of findings. There is a wide selection of appearance for presentation of results in integrative literature reviews including "a research agenda", "a taxonomy or other conceptual classification of constructs", "an alternative model or conceptual framework", and "a metatheory" (Torraco, 2016a, p. 363). For this study, the results were presented in text, tables, and conceptual classification that illustrate the findings. The conceptual classification is considered as a form to synthesize results from the previous research (Torraco, 2016a). The results of this study are presented in Chapter 4.

Validity of Integrative Literature Review in this Study

Validity is an important factor to consider for effective research. There are many methods of establishing validity, and there are also many threats that may impact validity (Cohen et al., 2018). While these threats may not be removed entirely, the consequences of these threats can be reduced through attention to validity throughout the research process (Cohen et al., 2018).

Asserting scientific integrity when performing an IRL should involve in-depth review of threats to validity (Russell, 2015). For example, in ILR, a potential for bias, error, and lack of rigor exists constantly. Thus, paying attention to the quality of the selected studies is required at all stages (Whittemore & Knafl, 2005). Copper (1982) documented rigorous and transparent strategies at each stage of IRL to minimize invalidity and maximize validity.

Regarding threats to validity in the problem identification stage, Cooper (1982) advises that a researcher should not define variables in a limited way because this will affect the quality of the findings when applied to different situations. Cooper also discouraged the use of broad operational definitions because this could lead to the omission of important study details and distinctions in the results. To minimize these threats and protect research validity, Cooper

suggested that the researcher begin with a few central operational definitions and remain open to other definitions that may be discovered during the review. Also, if the researcher begins with the broadest conceptual definitions, they must pay exhaustive attention to differences in each study's procedures and methods (Cooper, 1982).

In this study, to minimize overly broad or unclear concepts and definitions of BL, the researcher began with a few recognized operational definitions that were used at different academic institutions and remained open to other operational definitions that might be discovered during the review. It was also considered that some terms such as "blended learning," "hybrid learning," "blended instruction," and "hybrid instruction" were used interchangeably in research studies referring to one concept.

According to Cooper (1982), a major threat to validity in the data collection or literature search stages is the inability to gather all studies relevant to the topic of interest. Also, the units of concern in collected studies might not represent all units in the target population. To minimize these threats and protect research validity, Cooper (1982) suggests that researchers should conduct an exhaustive data collection to access as much information as possible, clearly describe the data collection process (including information on each study such as the date of publication and keywords), indicate potential retrieval bias when it exists, and summarize the characteristics of the participants included in the studies.

In this study, to minimize biases in selecting data, the researcher accessed the most extensive databases recommended in consultation with a librarian to gain the most applicable data sources. The researcher established specific search criteria, as described in the data collection phase. The researcher explicitly reported on the studies that were included as well as

those that were not included, and the reasons why. This was done through utilizing the PRISMA diagram.

Threats to validity in the data evaluation stage include researchers' use of biased criteria in evaluating data, and failure to evaluate the methodologies within each study. Methods evaluation is important to determine whether results are valid, and to protect against the possibility of unreliable results due to a lack of information reported by the primary studies (Cooper, 1982). To minimize these threats and protect validity, Cooper suggested that researchers may create evaluative criteria before reviewing the literature, explicitly clarify the criteria used for including or excluding studies (particularly based on the methodology), and have another reviewer also evaluate the studies.

In this study, to minimize biased criteria during data evaluation, the researcher utilized a wide variety of empirical research methods that were obtained from peer reviewed journals. Additionally, the researcher employed two different ways to appraise research studies (a methods-description approach and the MMAT) and documented these critically and explicitly.

According to Cooper (1982), threats to validity in data analysis and interpretation may arise because the researcher may misinterpret the data and fail to follow the right guidance of inference. Also, the researcher may infer inappropriate causality between variables when reviewing research. To minimize these threats and protect validity, Cooper (1982) suggested that researchers state their guidance of inference explicitly and carefully distinguish between direct study-based evidence and review-based evidence arising from indirect references from individual studies.

In this study, to minimize misinterpretation in data analysis, the researcher paid close attention to differentiating direct study-based evidence from indirect references. So, most

evidence of ILR collected from chapter 5 (discussion and conclusion) if the study is a dissertation or conclusion section if the study is journal article.

At the presentation of results stage, Cooper (1982) describes the threat to validity as the omission of important details about how an ILR was conducted. The researcher may also omit important findings about units and relationships that other researchers find important. To minimize this threat and protect validity, Cooper (1982) suggested that researchers be aware of and explicitly state all potentially important details in the report.

In this study, to minimize the omission of important findings in data presentation, the researcher wrote a chapter for findings (Chapter 4) that was formatted similarly to a primary research piece, and that focused much attention on all potentially important details.

Chapter Four: Results

The purpose of this study was to obtain understanding about the factors contributing to the successful implementation of blended learning (BL) in higher education institutions. These factors demonstrate why it is essential to gain insight into the perceptions of higher education administrators surrounding BL fulfillment, as well as the factors that impact the utilization of technology for educational purposes at universities. This chapter presents the results of the integrative literature review (ILR) that were empirically related to these factors, and determines whether there is underlying alignment between these factors and Rogers's Diffusion of Innovation and Ely's Eight Conditions. Evidence from an ILR comprised of 36 research studies has resulted in a visual representation to present the factors that assist higher education institutions transitioning into blended learning formats. As stated in Chapter 1, this study seeks to answer the following three research questions:

1. Based on the literature, what are the factors affecting the implementation of BL?

2. Based on the literature, how do the factors affecting the implementation of BL align with the work of Rogers's Diffusion of Innovation?

3. Based on the literature, how do the factors affecting the implementation of BL align with the work of Ely's Eight Conditions for Technological Change?

The results from this study are provided in two sections. The first section that follows discusses the general characteristics of the research studies. Tables showing the categorical characteristics of studies (distribution by years, methodology design, location, and participants) are presented and discussed to provide an overview of the studies included in this review. The second section reports results for research questions 1, 2, and 3.

Characteristics of Studies

In total, 36 empirical studies were selected for the integrative literature review. Of these, 19 studies were peer reviewed journal articles, and 17 studies were dissertations. All dissertations were Ph.D. studies

This ILR reviewed studies spanning the years from 2004 to 2019. Most of the studies took place between 2012 and 2019 (N = 19) (see Figure 7). Half of the studies were conducted during and after 2013 (Median = 2013), and the number of included studies was highest for the year 2012 (Mode = 2012).

Figure 7

Distribution of Studies by Years

Distribution of Studies by Years
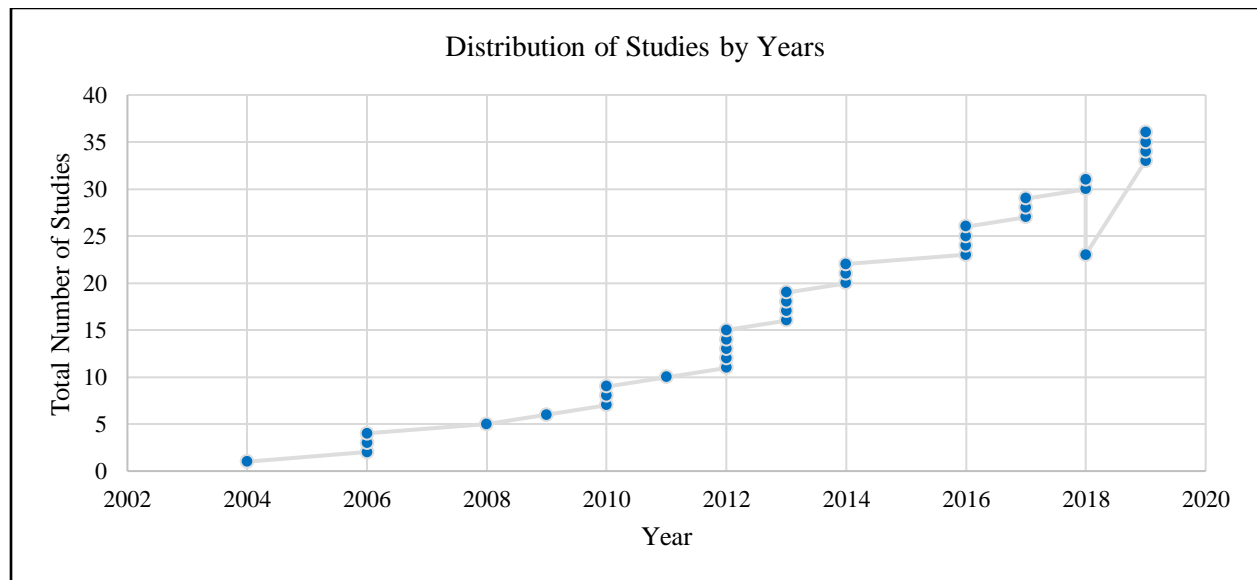
The empirical studies were divided into three categories based on methodology design. Studies were categorized as Qualitative, Quantitative, or Mixed Methodology, with 17 studies being Qualitative, 4 being Quantitative, and 15 studies being mixed (see Figure 8).

Figure 8

Distribution of Studies by Methodology Designs

Distribution of Studies by Methdology
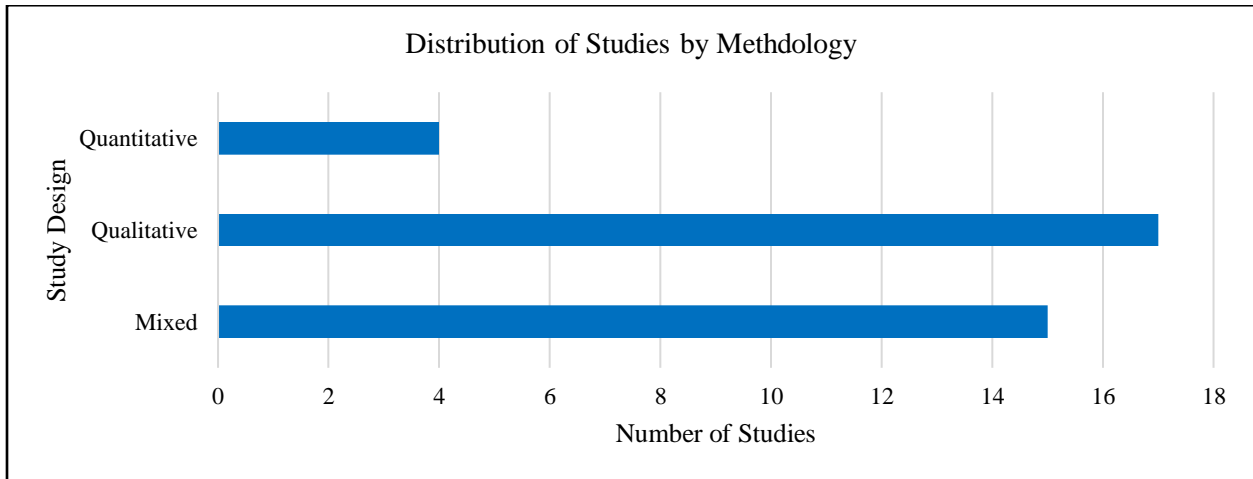
Studies included in the review were conducted across different continents in over 11 countries including Australia, Canada, China, Colombia, KSA, Netherlands, South Africa, Tanzania, Caribbean Island States, UK, and the USA. Most of them (N=18) were conducted in the United States (see Figure 9).

Figure 9

Distribution of Studies by Location

Distribution of Location
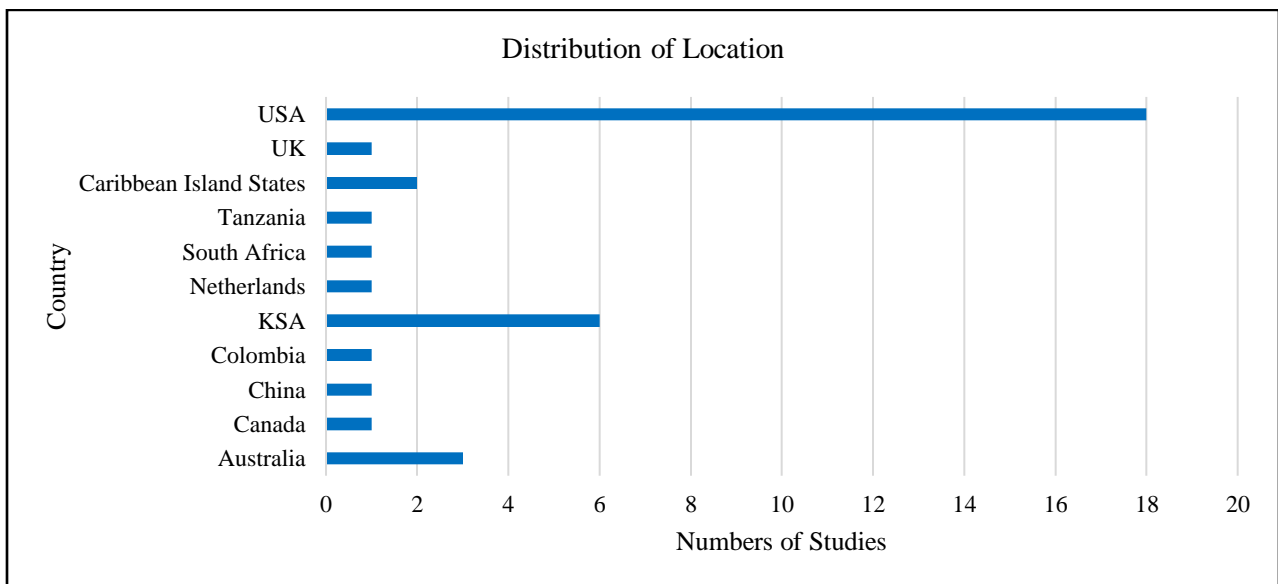
As shown in the following figure (Figure 10), faculty members were the most common participants, and were mentioned within 31 studies. Faculty members represented different ranks including full professors, associate professors, assistant professors, adjunct professors, lecturers, or teaching assistants. They represented a variety of subject areas including Accounting and Taxation, Applied Studies, Arts, Business Administration, Community Service, Computer Science, Criminal Justice, Education, Engineering, Healthcare, History, Humanities, Information Systems, Kindergarten, Languages, Law, Library and Information Sciences, Management, Marketing, Math, Medicine, Natural Science, Nursing Education, Political Science, Psychology, and Sciences.

Administrators participated in 22 studies, and were identified as administrative office workers, directors of distance learning, directors of BL initiatives, deans, heads of academic departments, and vice or associate provosts. Student participants were also mentioned in 12 studies. Additional types of participants were mentioned in 7 studies, and were identified as instructional designers, learning technologists, or librarians (see Figure 10).

Figure 10

Distribution of Participants by Studies
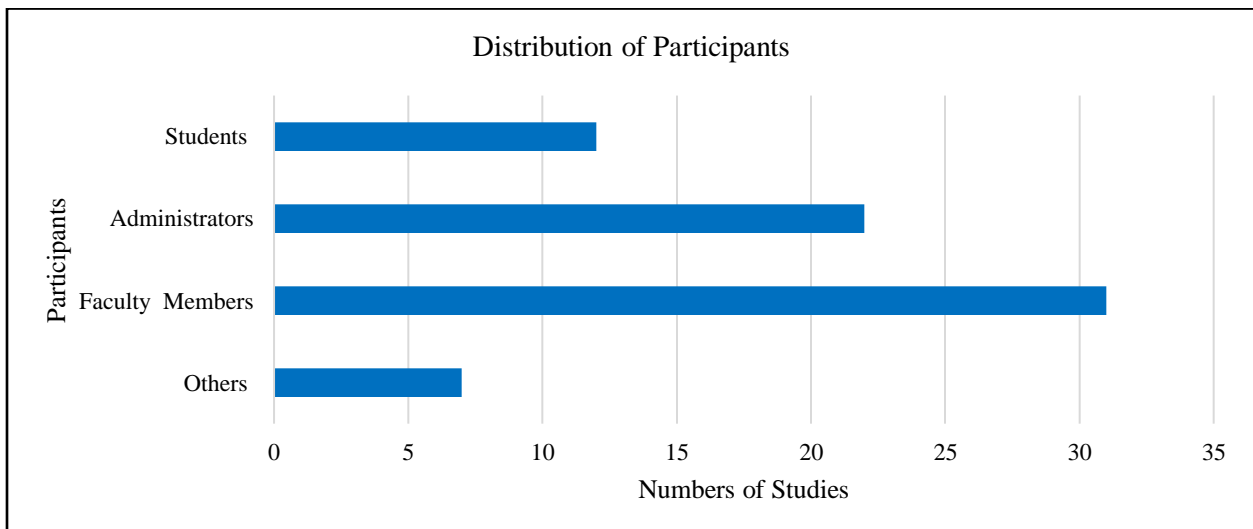
In the following section, results centered on answering the three research questions are presented and discussed. The section begins by identifying factors from the literature review that relate to the implementation of BL in higher education. This is then supported by a discussion of alignment between the factors and the theoretical foundations of Rogers and Ely.

Results for Research Question One

Research Question One states, "Based on the literature, what are factors regarding the implementing of BL?" The primary purpose of this question was to review and summarize some of the institutional factors that had proven to be crucial for BL implementation in previous empirical studies. One finding from this study was that 23 factors emerged as prominent from the integrative literature review (ILR). These included (alphabetically): 1) BL Advocacy, 2) BL Definition, 3) BL Plan, 4) BL Policies, 5) BL Programs/Courses, 6) BL Purpose, 7) BL Vision, 8) Collaboration, 9) Commitment, 10) Communication, 11) Evaluation, 12) Faculty and Students' Existing ICT Skills and Experience, 13) Faculty and Students' Perceptions, 14) Faculty and Students' Readiness, 15) Faculty and Students' Support, 16) Funds, 17) Incentives and Rewards, 18) Infrastructure and Resources, 19) Leadership, 20) Professional Development, 21) Professional Staff Assistance, 22) Service, and 23) Time.

Factor #1: BL Advocacy

Approximately 25% of studies remarked upon this factor. This indicates that the change process should start with increasing awareness for the potential benefits of BL, as well as the needs for adopting and implementing BL methods (Garrison & Vaughan, 2013; Mestan, 2019). BL plans may incorporate the general design process of BL, including forms of advocacy (Graham et al., 2013). Graham et al. (2013) extrapolated that successful implementation of BL courses commences with "an administrative advocate" who can persuade others of the

importance of conducting BL. These advocates also help to disseminate the idea of a BL initiative to other academic units. This is especially important when BL first starts to diffuse. Once BL becomes more advanced, institutional systems can be asked to support the BL format (Graham et al., 2013). The administrative advocate, such as a respected college dean, can serve as an inspiration for change. They can also continue endorsing successful BL faculty members during the implementation of BL courses (Robison, 2004). Porter et al. (2014) asserted that institutions must distinguish and develop a group of advocates at several institutional levels including, "school and department administrations, faculty resource centers, faculty members, and students." The rationale behind this is to create a common BL implementation vision, to gain necessary appropriations, to attract possible adopters (Porter et al., 2014), and to accelerate the promotion of BL ideas and possibilities (Wang & Han, 2017). Advocacy can be different for different individuals such as deans and administrative officers (Mestan, 2019; Thurab-Nkhosi, 2018), leaders of academic units (Graham et al., 2013), faculty (Crosz, 2014), and existing BL adopters (Porter et al., 2016). For example, administrators could educate faculty members and students about the institution's objectives and the possible advantages of BL (Mestan, 2019). They might also make sure that academic departments are fully prepared to implement BL (Thurab-Nkhosi, 2018). Leaders of academic units could participate in making decisions, specifically concerned with how BL would have implications for their own units (Graham et al., 2013). Faculty members can serve as advocates through implementation. In this case, implementing BL seems less threatening since the innovation is pushed forward by faculty rather than "an administrative mandate" (Crosz, 2014). Existing BL adopters such as innovators and early adopters can also help with advocacy and professional development work (Porter et al., 2016).

Factor #2: BL Definition

Approximately 36.1% of studies included this factor. Authors affirmed that it would be necessary for institutions to undertake concerted efforts to explain what BL means. An explicit definition is required to have all individuals on the same wavelength (Adekola et al., 2017; Alebaikan, 2010; AlGhanmi, 2018; Graham et al., 2013; Mestan, 2019; Porter et al., 2016; Robison, 2004, Taylor & Newton, 2013; Thurab-Nkhosi, 2018). Administrators should publish a standard definition of BL that classifies two major dimensions of BL structure: face-to-face and online instruction (Porter et al., 2014). Porter et al. (2014) emphasized that the acknowledged definition of BL must concentrate on the structural dimensions of BL rather than the pedagogical. The definition must be "inclusive" instead of "restrictive" (Garrison & Vaughan, 2013), allowing faculty to have pedagogical flexibility based on their subject areas and students (Porter et al., 2014). Graham et al. (2013) extrapolated that institutions may start with no uniform definition of BL, progress to a proposed initial definition of BL, and finally reach a mature level of implementation in which they have formally adopted a refined definition of BL. Wittmann (2006) suggested having open dialogue with faculty in order to reach an agreed upon meaning for the BL concept. Each and every stakeholder has to be cognizant about the definition of BL before asking them to widely embrace it (Alebaikan, 2010; AlGhanmi, 2018; Taylor & Newton, 2013). Creating an obvious label and adequate definition for BL will facilitate different purposes including helping to update institutional enrollment and scheduling systems to differentiate BL courses from other delivery formats (Graham et al., 2013), providing students with a chance to make decisions regarding delivery options, offering students straightforward expectations about BL courses, helping faculty to design suitable instructional learning strategies (Taylor & Newton, 2013), and outlining newly required BL duties (Tshabalala et al., 2014).

Factor #3: BL Plan

Approximately 33.3% of studies mentioned this factor. Once an institution decides to adopt and implement a BL approach, the first essential prerequisite for success is planning (Singleton, 2012). BL as a new initiative should be carefully regulated in coherent and coordinated context (Adekola et al., 2017). This requires a definite, transparent, action plan to determine, assess, and diffuse this approach (Aldosemani et al., 2019; Garrison & Vaughan, 2013; Medina, 2018). Authors emphasized the need for an institutional strategic plan when making a fundamental shift to BL modalities (AlGhanmi, 2018; Aljahni, 2014; Garrison & Vaughan, 2013; Kastner, 2019; Singleton, 2012; Thurab-Nkhosi, 2018; Wang & Han, 2017). Carbonell et al. (2013) highlighted the importance of the role of a visionary leader that coordinates the BL plan at an institutional level regarding appropriate technology infrastructure and tools, support systems, and financing. The plan, according to Graham et al. (2013), may include elements related to BL design for a whole course or program such as a BL definition, advocacy, degree, purpose, and related policies. In general, developing a strategic plan should be involved to support the integration of BL structures into the normal operations of institutions.

Factor #4: BL Policies

Approximately 36.1% of studies discussed this factor. Drafting clear institutional policies that outline and enhance the implementation of BL is crucial (Kastner, 2019; Porter et al., 2016; Thurab-Nkhosi, 2018; Tshabalala et al., 2014; Wittmann, 2006). Authors affirmed that clear and comprehensive official institutional policies are important for adopting and implementing BL (AlGhanmi, 2018; Aljahni, 2014; Kastner, 2019; Porter et al., 2016; Thurab-Nkhosi, 2018). AlGhanmi (2018) argued a BL initiative plan may become ambiguous when there is failure to provide rigorous rules that guide the adoption and implementation of BL. Graham et al. (2013)

described institutional policy structure among the three levels of BL adoption. First, there is no regular BL policy in place at the awareness level. Next, there are temporary policies at the early implementation level, and finally, there are strong policies with minor need for revision at the mature implementation level. Garrison & Vaughan (2013) asserted that writing directive documents should be accomplished in "an open and collaborative manner," and could be done in the form of a BL Handbook to serve as, "a uniform course quality framework across the institute" (Wang & Han, 2017). Oh (2006) extrapolated that the practices of BL are diverse in accordance with blended instructional circumstances and institutional policies. Authors have suggested that intuitional policies may be established to "enable and even encourage BL" (Graham et al., 2013), concentrate on "ownership and accessibility of materials" (Graham et al., 2013), "facilitate uniformity and provide adequate guidance" (Porter et al., 2016), succussed the transition to BL (Singleton, 2012), offer "guiding principles for implementation" (Thurab-Nkhosi, 2019), provide "on-going guidance for BL design and delivery (Wang & Han, 2017), or "standardize quality assurance for courses across the whole institute" (Wang & Han, 2017).

Factor #5: BL Programs/Courses

Approximately 38.9% of studies described this factor. Calderon et al. (2012) stated that institutions may investigate appropriate modalities for, "designing original blended courses and/or programs as well as converting face to face courses or programs into a blended format." The authors also added that the institution may consider appropriate modalities for supporting BL programs in the domains of, "admissions, advising, registration, financial aid procedures, etc." (Calderon et al., 2012). Institutions may manage and form a BL team to lead the new processes of course or program design, or to work as a group of judges to provide and apply their opinions and modifications to existing course or program designs (Alebaikan, 2010; Robison,

2004; Wang & Han, 2017). According to several authors, the institution can also provide instructional design and course development support to aid the course development process, create opportunities for individual consultation (Al-Sarrani, 2010; Adekola et al., 2017; Blanchette, 2016; Porter et al., 2016; Singleton, 2012; Thurab-Nkhosi, 2019), and promote templates created by instructional designers and authored by faculty (Singleton, 2012). Authors suggested providing opportunities to pilot portions of BL courses with students who are able to provide intelligent criticism about user-friendliness and the academic value of "a learning activity or resource." With this input, modifications might be made before moving forward to full-scale implementation (Garrison & Vaughan, 2013). When it comes to implementing BL as a delivery mode, approval should be provided from different levels such as from both the institution and department (i.e., deans and department chairs) (Graham et al., 2013). Institutions vary in their procedures to approve new programs/course delivery. According to Graham et al. (2013), in institutions at an awareness stage of BL, there is no authorized approval or implementation system present. In institutions at an early stage of implementing BL, there is an emerging system to approve BL courses. In institutions at a growth stage of BL, there is a strong system to make decisions regarding BL courses. After a course is approved and ready for the final experiment, institutions may update course catalogs to include BL courses until awareness for BL courses evolves rapidly (Moukali, 2012; Porter et al., 2014). Graham et al. (2013) indicated that the designation for BL courses at institutions may vary based on the level of BL implementation from awareness to mature. At the awareness level, course catalogs do not designate whether a class is blended or face to face. At the early implementation level, the course catalogs designate whether a class is blended or face to face. Finally, at the mature level, the course catalogs designate if a class is blended or face to face with modality metadata. To

advertise a course, the institution may design a BL course demo to provide stakeholders a clear overview of BL, as well as the specific benefits (Moukali, 2012). In general, in order to create and launch BL courses/programs, collaboration among faculty, the BL team, and administrators is needed.

Factor #6: BL Purpose

Approximately 47.2% of studies discussed this factor. Whenever an institution establishes "a university-wide modification," there needs to be a fundamental purpose behind the transformation (Singleton, 2012), and several significant questions must be discussed concerning both the merits and demerits of this transformation (Suwa, 2011). It is obligatory for an institution to articulate the BL purpose along with "measurable goals" inclusive of planning procedures (Aljahni, 2014; Singleton, 2012). These purposes serve as reasons that justify an institution's implementation of BL (Alebaikan, 2010; Singleton, 2012), while measurable goals contribute to the effectiveness of implementation (Singleton, 2012). The purpose of BL should be established with input from stakeholders including students, faculty, and institutional needs, hopes, and affordability (Medina, 2018, Porter et al., 2014). Graham et al. (2013) and Porter et al. (2016), have asserted the need for administrators to be clear about their purposes for implementing BL. Porter and Graham (2016) and Porter et al. (2014) found that alignment between administrators' "goals and values" and faculty purposes for implementing BL may have a greater impact on a respondent's decision for adoption. Mestan (2019) found that administrators also need to inform stakeholders about the institutional purpose and possible advantages of the BL delivery mode. According to Graham et al. (2013) and their BL adoption framework, administrators and faculty at the awareness stage may informally specify the purposes for adopting BL as a delivery mode. At the adoption stage, administrators may specify

purposes to encourage the adoption of BL. At the growth stage for implementation of BL, administrators improve the purposes for the further "promotion/funding of BL." According to the authors in this integrative review, there are a variety of purposes for implementing BL methods. For example, incorporating current technology in the learning environment (Al-Sarrani, 2010; Alebaikan, 2010; AlGhanmi, 2018; Singleton, 2012), accomplishing desired projects (Al-Sarrani, 2010), solving a problem such as an inadequate number of faculty members (Al-Sarrani, 2010) or inadequate number of facilities (Alebaikan, 2010), meeting stakeholder needs and anticipation (Adekola et al., 2017; Carbonell et al., 2013; Medina, 2018; Taylor & Newton, 2013), addressing the needs of an advanced digital landscape (Adekola et al., 2017), staying competitive (Adekola et al., 2017; Singleton, 2012, Wittmann, 2006), enhancing student learning experience (Adekola et al., 2017; Alebaikan, 2010; Singleton, 2012), reaching higher education strategies and standards (Adekola et al., 2017), moving with the international trends (Adekola et al., 2017, Alebaikan, 2010), removing the obstacles of time and space (Alebaikan, 2010), minimizing the costs of education (Al-Sarrani, 2010; AlGhanmi, 2018, Thurab-Nkhosi, 2018), and making BL a consistent alternative option throughout the whole institution (Singleton, 2012; Wittmann, 2006). In general, if institutions implement the BL delivery mode to address the needs of all stakeholders simultaneously, then this format will be a powerful force for change.

Factor #7: BL Vision

Approximately 16.7% of studies described this factor. Substantial institutional change to the BL modality should take place in the presence of a shared vision that reaches all sectors of an academic institution (Taylor & Newton, 2013). This shared vision could maximize the real possibilities of this approach (Kastner, 2019). Authors have suggested that having a BL vision would be worthwhile if it was aligned with the university's mission, goals, and objectives

(Aldosemani et al., 2019; Garrison & Vaughan, 2013; Kastner, 2019). Taylor and Newton (2013) clarified that the vision of BL as innovation is created over a period of time as a result of social progress based on interpersonal relationships. Garrison and Vaughan (2013) found that strategic change to BL is dependent on a collaborative workspace to create a clear, shared vision among constituting members. Kastner (2019) indicated that while institutions are the ones implementing BL courses, all stakeholders should be involved in consultation and provision to create a common vision. Wang and Han (2017) argued that in the absence of BL vision in an academic institution, it would be difficult for stakeholders to begin and sustain BL adoption and implementation. Thurab-Nkhosi (2018) affirmed that guaranteeing a shared vision by involving all stakeholders, including students, makes it easier to prevent insufficient awareness of BL in addition to facilitating the development of an appropriate strategic management plan.

Factor #8: Collaboration

Approximately 22.2% of studies mentioned collaboration. Collaboration is crucial to achieving significant goals of BL implementation (Carbonell et al., 2013; Deutsch, 2010; Garrison and Vaughan, 2013; Grosz, 2014; Kastner, 2019; Taylor & Newton, 2013; Thurab-Nkhosi, 2018). It is dynamic work that depends upon sharing and building upon existing expertise among team members, who assist each other to create new expertise for an institution (Carbonell et al., 2013). Radical transformations to BL teaching and learning methods can bring forward collaboration that involves all levels of the institution (Garrison & Vaughan, 2013). Therefore, implementing BL demands engagement among the two main levels: administrative and faculty with considerable degrees of collaboration and commitment (Carbonell et al., 2013). The authors stated that some of the benefits of collaboration include reducing faculty feelings of loneliness and discouragement, facilitating active participation in employing technology in BL

courses (Deutsch, 2010), and preventing resistance that may happen during adoption and

implementation (Thurab-Nkhosi, 2018). Therefore, faculty must be given the opportunity to

exchange experiences, reflect on their teaching practices, and discuss the impacts of BL delivery

in a professional community with institutional leaders and peers (Blanchette, 2016; Deutsch,

2010; Grosz, 2014; Kastner, 2019; Taylor & Newton, 2013). Garrison and Vaughan (2013)

affirmed that BL programs or courses could not be achieved or sustained when there was a

failure to provide "collaborative and distributed institutional leadership."

Factor #9: Commitment

Approximately 11.1% of studies mentioned commitment. Institutional stakeholder

commitment is also a fundamental component (Adekola et al., 2017; Blanchette, 2016). Garrison

and Vaughan (2013) asserted that significant transformation to a BL approach, and the

considerable pedagogical advantages of BL can be accomplished with sustained commitment.

Major drivers for implementing BL such as improving learning environments, ensuring quality

learning, meeting stakeholders' expectations, etc. may influence the commitment of stakeholders

including "students, faculty, and senior management" (p.12).

Factor #10: Communication

Approximately, 19.4% of studies mentioned communication. In speaking about

communication, Singleton (2018) expressed that when planning for change to BL,

communication needs to be a substantial part of the process. Creating an effective link between

top and local levels to make BL plans operational requires communication across the institution

(Adekola et al., 2017). Authors suggested that institutions provide all those involved in the

change process with a window of opportunity for communication as a committee (Calderon et

al., 2012; Suwa, 2011). Communication may occur among all parties including students, faculty,

and administration regarding the resources available (Calderon et al., 2012), student success in a new learning environment (Singleton, 2012), full awareness of BL requirements (Suwa, 2011), and faculty perspectives in reference to BL (Wittmann, 2006). It may also occur among faculty, administration, and instructional designers in order to resolve problems that are detected during the implementation process (Singleton, 2018). In truth BL models that capitalize on respect and engagement from all levels of the institution are immediately recognizable and achievable (Garrison & Vaughan, 2013; Meyertons, 2006). It is crucial for institutions to provide "psychological safety" for making this engagement happen, especially when experimenting with new teaching and learning formats in which challenges may be encountered (Carbonell et al., 2013).

Factor #11: Evaluation

Approximately 52.8% of studies remarked upon this factor. BL evaluation must be purpose driven. At the time when institutions make "a university-wide transition," a technique to evaluate the transition needs to be available (Singleton, 2012). Authors affirmed that in order to manage the shift to BL, evaluation methods should exist and be enhanced through triangulation of data from multiple sources provided by faculty members (Al-Sarrani, 2010; Alebaikan, 2010; AlGhanmi, 2018; Blanchette, 2016; Suwa, 2011; Wang & Han, 2017) and students (Alebaikan, 2010; AlGhanmi, 2018; Mestan, 2019; Porter et al., 2014; Wang & Han, 2017). Medina (2018) postulated that even before shifting to BL, "a preliminary needs analysis" must be carried out to assess the possible advantages and disadvantages of implementing BL methods. This needs analysis should serve as a base for further action. Taylor and Newton (2013), Alebaikan (2010), Calderon et al. (2012), and Singleton (2012) extrapolated that concentrating on faculty and student experiences means that both units have a voice and contribution towards the evolution of

the BL approach and the construction of delivery standards. Alebaikan (2010) stated that periodic

assessment based on faculty and student feedback aids in program improvement and the

enhancement of learning experience. AlGhanmi (2018), Porter and Graham (2016), and Peruso

(2012) agreed that it is necessary to have designated evaluation procedures from start to finish

when adopting and implementing BL. Institutional productiveness should be rooted in

"intentional assessment and evaluation practices" for each program and course (Blanchette,

2016). AlGhanmi (2018) suggested that institutions may have obvious and practical evaluation

rubrics to assess BL programs or courses. Graham et al. (2013), in their BL adoption framework,

mentioned that no official evaluation is conducted to address BL delivery at the awareness level

of BL. Limited institutional evaluation is conducted at the early implemention level of BL. By

contrast, systematic data review is conducted at the mature implementation level of BL.

According to authors, some of the underlying motivations for distributing assessment surveys are

to identify faculty concerns and challenges in the BL environment (Deutsch, 2010), judge the

usefulness of the BL environment (Graham et al., 2013; Porter et al., 2016), know if BL

objectives and goals are being achieved (Singleton, 2012), determine pedagogical and

technological requirements and effects (Taylor & Newton, 2013), investigate the effectiveness of

services provided by the institution (Raphael & Mtebe, 2016), and measure faculty technological

qualifications and attitudes toward BL (Villalon & Rasmussen, 2017).

Factor #12: Faculty and Students' Existing ICT Skills and Experience

Approximately 41.7% of studies commented about faculty ICT skills and experience and

19.4% of studies about student's ICT skills and experience. ICT skills (mentioned by authors as

technical capabilities, digital literacies, technological or computer skills) have a significant role

to play in BL implementation (Adekola et al., 2017; Oh, 2006, Tshabalala et al., 2014).

Administrators should pay special attention to identifying the need for important ICT skills in order to respond accordingly and provide adequate support (Blanchette, 2016; Deutsch, 2010; Suwa, 2011; Thurab-Nkhosi, 2018). Authors specified that administrators should be sure that faculty who teach BL courses currently have, and persistently update their ICT skills capacity to facilitate student learning (Raphael & Mtebe, 2016, Suwa, 2011). Students who are taking BL courses should also have the basic skills and equipment needed to make use of required technologies (Suwa, 2011; Taylor & Newton, 2013). Both faculty and students should have competence to undertake pressing tasks (Adekola et al., 2017; Raphael & Mtebe, 2016; Robison, 2004; Villalon & Rasmussen, 2017). Aljahni (2014) found that ICT skills were important to faculty and students as the human element that enables the establishment of a BL environment. Moukali (2012) in his dissertation recommended encouraging faculty to improve their ICT proficiency by attending applicable seminars, workshops, and conferences. Students should also do this by attending free training courses about software applications. Several authors have proven that ICT skills and expertise with technology have impacted faculty views towards the implementation of BL courses (Alebaikan, 2010; Villalon & Rasmussen, 2017), that ICT skill levels have a high and positive correlational relationship with faculty attitudes toward BL (Brooks, 2008, Villalon & Rasmussen, 2017), and that ICT skill level is a strong indicator for the potential success of a BL course (Robison, 2004; Villalon & Rasmussen, 2017). Brooks (2008) also found that expertise with online instructional technology, training, and an introduction to BL may be predictive of faculty attitudes toward BL.

Factor #13: Faculty and Students' Perceptions

Approximately 22.2% of studies indicated that this factor was important. Stakeholder perceptions (including those of faculty and students), regarding how they view the

implementation of BL are important to know. This is especially true, considering that faculty

perceptions of BL may aid in creating change (Wittmann, 2006; Blanchette, 2016). Brooks

(2008) declared that administrators should make every effort to recognize faculty perceptions

and opinions about aptitudes required within the BL environment. Concerns and needs should

also be discussed regarding the innovation itself, time, energy, skills required by the innovation,

the availability of resources, etc. (AL-Sarrani, 2010). Faculty might reveal that they have some

awareness about BL courses, but that they have concerns regarding support, training, and extra

workload (Aljahni, 2014). AL-Sarrani (2010) and Porter et al. (2016) confirmed that

administrators should identify any faculty concerns and needs that may affect their adoption of

BL courses. On the other hand, Peruso (2012) mentioned that a student's point of view (as

customers of a university) is also significant and important to educational administrators in order

to guarantee the survival of the university. This is particularly related to "retention and future

enrollments" influenced by student perceptions of the advantages associated with an academic

experience (Peruso, 2012). It therefore appears necessary to know about all stakeholder

perceptions, including students, before and during the development and implementation of BL

(Suwa, 2011).

Factor #14: Faculty and Students' Readiness

Approximately 13.8% of studies included this factor. Taylor and Newton (2013)

highlighted that readiness occurs when BL is favorably received by the entire university and

actively involved stakeholders. Authors extrapolated that one of the roles of senior leadership is

to make sure that the entire institution is ready and able to implement BL (Taylor & Newton,

2013; Thurab-Nkhosi, 2018). Senior leadership should aim to facilitate, sponsor, and investigate

the initiation of BL to ascertain that it is resourced at the highest level to achieve "a groundswell

of readiness" (Taylor & Newton, 2013). Thurab-Nkhosi (2018) confirmed that administrators should guarantee that faculty members are fully prepared to implement BL. It is essential for administrators to get to know faculty impressions regarding BL in order to effectively address demand for assistance and advancement (Blanchette, 2016). It is likely to be true that faculty attitudes toward BL are influenced by different variables, even if faculty members are trained adequately (Brooks, 2008). Brooks (2008) extrapolated that faculty attitudes, whether positive or negative, were affected by BL as a general concept, BL offerings at their campus, the attitude of the administration toward BL, and other faculty attitudes toward BL. Oh and Park (2009) extrapolated that a broad array of faculty are deeply convinced about the BL format, and are willing to learn essential technology skills for their classes. When faculty members take part in establishing and delivering BL, this means that they have positive attitudes and are willing to improve their instructional delivery quality (Oh & Park, 2009). Taylor and Newton (2013) argued that students should be ready to receive "academic, technological, administrative and personal support" that is needed throughout the entire student learning journey. Readiness is not readily known but can be measured. In summary, readiness means that the institution has an overall positive attitude towards the implementation of BL, and that the institution plays an active role to engage diverse people (Taylor & Newton, 2013).

Factor #15: Faculty and Students' Support

Approximately 69.4% of studies discussed faculty support, and 41.7% of studies discussed student support. Alebaikan (2010) stated that BL in an academic environment without any online learning experience demands carefully planned support and programs to train both students and faculty members. Administrators must provide faculty and students with chances to acquire quality technical support in a reliable and regular manner (Meyertons, 2006). Faculty

members are one of the most crucial components to the implementation process of BL. Faculty

support is vital to BL adoption and implementation, and it should be emphasized that faculty

support should be of the greatest importance at any educational institution (AlGhanmi, 2018;

Aljahni, 2010; Carbonell et al., 2013; Deutsch, 2010; Mestan, 2019; Oh & Park, 2009; Taylor &

Newton, 2013; Villalon & Rasmussen, 2017). As demonstrated by Mestan (2019), the quality of

BL can be enhanced if faculty are given satisfactory pedagogical and technical support, with

more emphasis on technological support (Adekola et al., 2017; Blanchette, 2016; Garrison &

Vaughan, 2013; Thurab-Nkhosi, 2018). Raphael and Mtebe (2016) and Suwa (2011) predicted

that the effectiveness of faculty support could be a key success indicator for delivering BL

courses. Faculty support, according to Graham et al. (2013), must be addressed in relation to

problems that an institution may experience in order to ease the implementation and maintenance

of BL. Authors suggested that it is necessary for faculty to be well supported by their institutions

through a variety of modalities (Raphael & Mtebe, 2016; Suwa, 2011) to ensure the efficient

implementation of a recently adopted approach (Thurab-Nkhosi, 2019; Wittmann, 2006).

Institutions looking to implement BL must decide how to constantly facilitate and support faculty

implementation of BL (Deutsch, 2010; Graham et al., 2013; Medina, 2018; Meyertons, 2006;

Porter & Graham, 2016; Porter et al., 2014; Porter et al., 2016; Singleton, 2012). Students are

also important stakeholders in any institution (Singleton, 2012). Ensuring appropriate and

continuous technical and pedagogical support for students is important - especially for those who

do not have the skills needed to succeed in BL classes (Porter et al., 2014; Suwa, 2011). The

authors assured the needs of technical support especially (Blanchette, 2016; Calderon et al.,

2012; Meyertons, 2006; Thurab-Nkhosi, 2018; Wang & Han, 2017). Adekola et al. (2017),

Robison (2004), and Suwa (2011) confirmed that the student transition to BL courses must be

supported by administrators with adequate mechanisms. The authors suggested different ways to support students through the transition to BL. Several authors highlighted the importance of training students with opportunities for continued professional development (Aldosemani et al., 2019; Alebaikan, 2010; Medina, 2018). Moukali (2012) found that students may be motivated to strengthen their technical proficiency if offered free training sessions about technology and their applications related to BL. Other authors suggested that before BL courses are officially launched, "orientation sessions" could be dedicated to preparing students for how the BL format will work, why some courses or programs will be delivered through the blended format, how to schedule BL courses, what technology is required, how to use these technologies (especially learning management systems), faculty and student expectations, how and where to request technical services when needed, and so on. So, the implementation of BL may require offering an adequate orientation (Alebaikan, 2010; Moukali, 2012; Taylor & Newton, 2013). Based on Graham's BL adoption framework (2013), an institution in the process of exploring BL prioritizes face to face classes, and there are no formal technical support or course improvement procedures in place. At an institution in the process of adopting of BL, the priority shifts to BL/online technical support for both students and faculty with new experimentation and formal course improvement procedures. At an institution with mature implementation of BL, firmly rooted BL/online technical support for both students and faculty is present, with strong course improvement procedures.

Factor #16: Funds

Approximately 19.4% of studies discussed this factor. Senior leadership must play their part in sourcing funds and conducting audits regarding BL implementation (Thurab-Nkhosi, 2018). Initiating and sustaining a BL environment can be costly (AlGhanmi, 2018). Aljahni

(2010) extrapolated that the economic element of "budget and financial incentives" is a necessary factor to establish a successful BL environment for long term sustainability. Mestan (2019) argued that BL should not be used as a way for institutions to cut costs. Instead, it is an investment that demands substantial expense to work well. Graham et al. (2013), in their BL adoption framework, mentioned that institutions at the growth implementation phase showed refinement in their aims to continuously fund BL. Authors indicated that there were different institutional perspectives on what funding goals to accomplish, such as seeking initial financing, recruiting trainers and developers for BL (AlGhanmi, 2018; Thurab-Nkhosi, 2018), employing new hardware and software technologies (Meyertons, 2006; Thurab-Nkhosi, 2018), hiring teaching assistants to relieve faculty workload while utilizing the BL format (Suwa, 2011; Thurab-Nkhosi, 2018), and providing faculty with supplies (Mestan, 2019).

Factor #17: Incentives and Rewards

Approximately 47.2% of studies included this factor. Authors agreed that faculty members could be motivated if credited for their extra work in accepting the transformation to BL. According to Brooks (2008) and Carbonell et al. (2013), incentives are items that may encourage faculty to adopt courses in the BL format. Graham et al. (2013) mentioned that when institutions are at the awareness stage of BL adoption, there is no definite faculty incentive system. Once institutions are in the process of adopting BL, there is more investigation aimed at a faculty incentive system for training and professional course development. Finally, when institutions are already implementing BL, there is a strong faculty incentive system for systematic training and professional course development. The incentives can come through multiple mechanisms, which are recommended in the literature. Course completion certificates (Aldosemani et al., 2019; Calderon et al., 2012; Thurab-Nkhosi, 2019), monetary compensation,

allowances (Aldosemani et al., 2019; Alebaikan, 2010; Aljahni, 2014; Brooks, 2008; Porter et al., 2016), recognition (Aldosemani et al., 2019; Brooks, 2008; Garrison & Vaughan, 2013; Meyertons, 2006), tenure and promotion (Porter et al., 2016), paid conferences and workshops (Meyertons, 2006; Raphael & Mtebe, 2016), and reduced workload (Adekola et al., 2017; AlGhanmi, 2018; Graham et al., 2013; Kastner, 2019; Porter et al., 2016) are examples of incentives. Aldosemani et al. (2019) and Thurab-Nkhosi (2019) suggested that a formal course completion certificate is a worthy initial incentive to promote the right attitudes toward preparing and delivering blended courses. According to Brooks (2008), recognition is just as important as a financial reward. Garrison & Vaughan (2013) found that from the faculty perspective, it is necessary to have incentives that include academic recognition. Raphael and Mtebe (2016) argued that administrators could employ a variety of means to motivate faculty involvement in BL courses. One of these means was a chance to participate in seminars and workshops followed by payment for transportation. Tenure and promotion incentives could attract, and be more influential for "newer faculty" (Porter et al., 2014) and faculty who have not yet obtained tenure, or at institutions with additional tenure procedures (Porter et al., 2016). Course load reductions might also be significant, especially for new adopters who need more time to plan, pilot, and reflect upon BL courses (Aldosemani et al., 2019; AlGhanmi, 2018; Porter et al., 2016). Porter et al. (2016) concluded that administrators might examine faculty opinions regarding these incentives in order to figure out whether these incentives would attract faculty at their institutions.

Factor #18: Infrastructure and Resources

Approximately 75% of studies discussed infrastructure and resources. This makes sense since utilizing technology underpins any BL method (Suwa, 2011). One of the most important

institutional priorities should be to have reliable resources and infrastructure. These should be ready and accessible in order to make the transition more appealing (Garrison & Vaughan, 2013; Porter et al., 2014; Singleton, 2012). Most authors in this integrative literature review agreed that significant change is dependent upon basic physical and virtual infrastructure. Blanchette (2016), Meyertons (2006), and Thurab-Nkhosi (2018) affirmed that institutions that adopt and implement BL require considerable investment in order to have strong infrastructure. Examples include physical aspects such as flexible learning spaces (Adekola et al., 2017; Alebaikan, 2010), high-speed Internet connections (Al-Sarrani, 2010; Adekola et al., 2017; Aldosemani et al., 2019; Alebaikan, 2010; Moukali, 2012; Oh, 2006; Porter et al., 2016; Porter et al., 2014) computer labs (Aldosemani et al., 2019; Alebaikan, 2010; Moukali, 2012; Oh, 2006), and advanced electronic devices (Al-Sarrani, 2010; Alebaikan, 2010; AlGhanmi, 2018; Carbonell et al., 2013; Moukali, 2012; Suwa, 2011; Tshabalala et al., 2014). Infrastructure also includes virtual aspects such as virtual learning environments (Adekola et al., 2017; Carbonell et al., 2013; Moukali, 2012; Raphael & Mtebe, 2016; Robison, 2004), digital libraries (Adekola et al., 2017; Calderon et al., 2012), and a streaming server (Carbonell et al., 2013). Al-Sarrani (2010), Moukali (2012), and Robison (2004) stated that the institution may have an instructional design division to assist faculty members in developing BL courses. On the other hand, Oh (2006), Raphael & Mtebe (2016), and Singleton (2012) suggested that there could be an information technology division to support faculty and students through the use of related eLearning technologies. Alebaikan (2010) also suggested that each institution may have a BL department in charge of ensuring academic rigor and the quality of BL course and program offerings. Administrators should take into account the allocation of sufficient resources to support both faculty and students (Adekola et al., 2017; Aldosemani et al., 2019; AlGhanmi, 2018; Calderon et al., 2012; Garrison & Vaughan,

2013; Kastner, 2019; Mestan, 2019; Singleton, 2012; Suwa, 2011). A faculty repository made up of a combination of resources may provide on-demand support. This repository might include "podcasts, videos, and MOOCs" (Aldosemani et al., 2019). A student repository might also be maintained. The student repository might include a variety of BL resources and lists of BL classes that are offered, along with a link to student support through the IT office (Calderon et al., 2012).

Factor #19: Leadership

Approximately 41.7% of studies named this factor. There is a need for support from institutional stakeholders when adopting and implementing a BL approach in learning and teaching (Adekola et al., 2017; Aljahni, 2014; Carbonell et al., 2017; Garrison & Vaughan, 2013; Medina, 2018; Porter et al., 2014; Taylor & Newton, 2013; Thurab-Nkhosi, 2018; Thurab-Nkhosi, 2019; Tshabalala et al., 2014; Wang & Han, 2017; Wittmann, 2006). Institutional stakeholders "are agents exert leadership and enforce decision-making processes" to enhance the academic standards for BL (Medina, 2018). Blanchette (2016) indicated that, in order to establish academic standards and expectations, it is appropriate to engage in crucial conversations between the administration and faculty members. According to Carbonell et al. (2017), changes can happen in two different ways: change can be determined by leadership and go down to faculty members (top-down procedure), or it can be initiated by faculty and go up to the leadership (bottom-up procedure). Carbonell et al. (2017) argued that both procedures have their strengths and weaknesses. Carbonell et al. (2017) and Wittmann (2006) extrapolated that distinctive change requires "an entrepreneurial spirit" by senior leadership to scale-up transformations to the BL approach and "unleash creativity" by faculty members to design and implement BL programs. To get the full benefits of both processes, both need to be involved. Wang and Han

(2017) asserted that a relationship between senior leadership and faculty members is an extremely important and productive relationship that moves BL implementation forward. Through this, a distribution of leadership should begin to emerge. Thurab-Nkhosi (2018) found that deans play a crucial role in filtering information down to heads of departments and administrative officers charged with the responsibility of exchanging information regarding BL affairs. At the same time, as BL affairs develop from the faculty level, they should be supplemented by senior leadership attention. This can be worthwhile for the institution, faculty, and students (Graham et al., 2013). As affirmed by Carbonell et al. (2017) the right people should be engaged in making change – for example, a leader who is in a position to provide a secure environment, and faculty who are not content with the current situation and who seek to improve it. This makes a significant contribution in a bottom-up manner (Carbonell et al., 2017). It is therefore necessary to have clear directives on who might be responsible for leading the change, and how deans and administrative officers among departments are supposed to collaborate with other change champions or leaders (Thurab-Nkhosi, 2018). As Porter et al. (2014) suggested, BL governance must involve multiple agents such as institutional administrators, departmental heads, and faculty members. Those agents are responsible for providing facilities and plans for BL and career development. They should articulate vision (Adekola et al., 2017), establish objectives, develop policies, devise strategies (Aljahni, 2014; Wang & Han, 2017), concentrate on educational and financial affairs (Medina, 2018), investigate implementation to ensure it is resourced and sponsored at the highest standards (AlGhanmi, 2018; Taylor & Newton, 2013), monitor implementation to ensure the availability of technical and pedagogical support (AlGhanmi, 2018; Thurab-Nkhosi, 2019; Wang & Han, 2017),

reconstruct IT infrastructure (AlGhanmi, 2018; Wang & Han, 2017), and sustain and coordinate implementation to a unified standard (Wang & Han, 2017).

Factor #20: Professional Development

Approximately 86.1% of studies cited this factor. Most studies asserted an inherent need for faculty professional development in order to successfully implement BL. Professional development presents a prime opportunity not only to expand knowledge, but to build confidence, acquire skills, support competency, increase positive attitudes toward current and emerging technology practices (Aldosemani et al., 2019; Medina, 2018; Moukali, 2012; Raphael & Mtebe, 2016; Thurab-Nkhosi, 2019; Tshabalala et al., 2014; Villalon & Rasmussen, 2017; Wittmann, 2006), and most importantly to lead to a greater rate of innovation adoption (Grosz, 2012). Both new hires and experienced BL faculty members should be involved with development programs that train them to successfully adopt and implement BL (Deutsch, 2010; Graham et al., 2013). Authors have also recommended that when designing training programs, administrators should take into consideration several variables including potential trainers, the number of faculty that need training, faculty needs, faculty attitudes toward technology, faculty enthusiasm about BL, etc. (Deutsch, 2010; Porter et al., 2014). Al-Sarrani (2010) contended that professional development could take the form of sessions that provide faculty with information on major topics regarding BL. Authors confirmed that the sessions should be proactive (Blanchette, 2016), intensive (Wang & Han, 2017), extensive (Alebaikan, 2010), effective, extended (Grosz, 2012), and offered on an ongoing basis (Aldosemani et al., 2019). Administrators may take advantage of several delivery methods to meet faculty preferences and needs, such as providing group, one-on-one, face to face, or online training sessions (Aldosemani et al., 2019; Porter et al., 2016) supplemented with online materials such as online handouts,

video tutorials (Aldosemani et al., 2019), or a BL guidebook (Singleton, 2012). Authors asserted that professional development sessions should be organized around topics. Examples of potential topics included, "Instructional design, e-learning strategies, content creation, learning management system use, student assessment" (Aldosemani et al., 2019), "computer applications and e-learning" (Alebaikan, 2010), "technology not only on functionality but potential learning applications" (Blanchette, 2016), "facilitating online discussions; facilitating group work in online courses; creating and using rubrics for assessment of blended/online courses, and using Blackboard and Web 2.0 tools to aid faculty in their teaching" (Calderon et al., 2012), "how to effectively create and integrate technology-based learning in a way that compliments what they do face-to-face" (Porter et al., 2016), "how to design, implement and manage a blended learning course" (Al-Sarrani, 2010; Robison, 2004), "equip faculty with the knowledge, skills, and attitudes for developing and delivering blended courses" (Thurab-Nkhosi, 2019), and "consistent information and support to produce, edit and distribute multimedia learning materials" (Taylor & Newton, 2013).

Factor #21: Professional Staff Assistance

Approximately 41.7% of studies pointed out this factor. Studies mentioned that administrators may consider additional staff support to assist faculty members. Formation of a BL team to lead the process of course design should be an administrator's priority (Wang & Han, 2017). Administrators may also invite "credible experts" or "leading national BL advisors" from outside of the institution, who can support the pedagogical and practical BL approach through conducting seminars (Garrison & Vaughan, 2013; Wang & Han, 2017). This diverse BL team or expert involvement contributes to the success of the change process since they are able to deal with innovation through a deliberate combination of new means and technologies (Carbonell et

al., 2013). There is a need to provide support to faculty members in the form of qualified personnel such as knowledgeable peers, educational technologists, instructional designers (Blanchette, 2016; Meyertons, 2006), and multimedia experts (Meyertons, 2006). Peers are considered role models for learning and sharing best practices (Adekola et al., 2017), and peer support is recommended by several authors (Adekola et al., 2017; Garrison & Vaughan, 2013, Meyertons, 2006; Porter & Graham, 2016; Singleton, 2012; Villalon & Rasmussen, 2017). Villalon and Rasmussen (2017) suggested that administrators take into consideration the importance of peer mentorship in providing information on best practices to implement BL effectively. Peer mentorship with the "show and tell" method allowed faculty members to receive valuable advice from their peers about their work (Garrison & Vaughan, 2013). Peer training is also recommended to help to provide a more complete picture of the BL model (Singleton, 2012). Blanchette (2016) recommended that administrators provide opportunities for peer mentoring and collaboration within their faculty professional development. Meyertons (2006) suggested that peer support could be encouraged and rewarded. Instructional designer support is also important. Administrators may consider hiring specialists to support faculty members in analysis, design, development, implementation, and evaluation of BL courses for the purpose of creating quality academic experiences (AL-Sarrani, 2010; Blanchette, 2016; Garrison & Vaughan, 2013; Meyertons, 2006; Porter et al., 2016; Raphael & Mtebe, 2016; Robison, 2004; Singleton, 2012; and Wittmann, 2006). They may also acknowledge that any new hardware, software, or media streaming servers may require additional support from specialists from the technology department (Carbonell et al., 2013; Meyertons, 2006). Thurab-Nkhosi (2019) contended that specialists could offer more professional development and support in the form of "hands-on-training" and follow-up consultations to encourage the design of BL courses.

Factor #22: Services

Approximately 25% of studies mentioned faculty services, and 22.2% of studies

mentioned student services. Effective implementation of BL demands the support of pedagogical

services for faculty and technical services for both faculty and students. Providing

complementary services is important to guarantee that faculty members are equipped with both

needed technological skills (Al-Sarrani, 2010; Adekola et al., 2017; Raphael & Mtebe, 2016;

Singleton, 2012), and pedagogical skills (Graham et al., 2013; Raphael & Mtebe, 2016). Also,

there is a need to consider accessibility of learning experiences for diverse students (Adekola et

al., 2017; Taylor & Newton, 2013; Wang & Han, 2017). Oh (2006) affirms that, in order to

increase student access to required classroom technologies, administrators must actively operate

appropriate services. Support for technical services is deemed critical for meeting various

degrees of digital competency (Adekola et al., 2017), as well as making the learning environment

conducive to utilizing technology for teaching and learning (Suwa, 2011). Calderon et al. (2012)

found that the presence of support services was a major predictor of satisfaction with BL courses,

especially because both faculty and students rely on technology to perform their responsibilities.

Administrators may assign and recruit appropriate IT staff members to solve hardware, software,

technical, and access problems (Al-Sarrani, 2010). IT staff members may be available through

on-campus services at particular times for technical assistance (Alebaikan, 2010), or as suggested

by Al-Sarrani (2010), Suwa (2011), and Oh (2006), may be available 24/7 through web-based

services in the form of a help desk or help line. IT staff members could provide services by

utilizing well-documented written instructions (Alebaikan, 2010; Suwa, 2011) or oral

instructions (Alebaikan, 2010). According to Taylor and Newton (2013), these services may

include guidance on necessary technical abilities for BL courses. For example, student services

could be catered towards, "headset with microphone for Elluminate, conferencing program, how to access online resources, how to download files," while faculty services could be designed to assist with "produce, edit and distribute multimedia learning materials" (p.56).

Factor #23: Time

Approximately 41.7% of studies brought up this factor. Time is important as a support mechanism that should be provided to faculty members (Adekola et al., 2017; Alebaikan, 2010; Aljahni, 2014; Carbonell et al., 2013; Kastner, 2019; Mestan, 2019; Meyertons, 2006; Porter et al., 2016; Porter et al., 2014; Suwa, 2011). An adequate amount of time is necessary to fully adopt and implement BL at institutions (AlGhanmi, 2018; Porter et al., 2016; Suwa, 2011; Taylor & Newton, 2013; Wittmann, 2006), and it would be helpful for administrators to recognize that changes to the way instruction is delivered will take additional time and energy (Aldosemani et al., 2019; Kastner, 2019; Wittmann, 2006). Singleton (2012) and Mestan (2019) have argued that transitions should not occur rapidly, and that administrations need to allow gradual transitions for higher quality course formation. Authors indicated that faculty members should be provided with additional time to develop new BL courses due to the fact that designing BL courses is more "labor intensive" than traditional courses (Alebaikan, 2010; AlGhanmi, 2018; Mestan, 2019; Meyertons, 2006; Suwa, 2011).

Summary of Research Question #1

Based on the evidence from previous empirical studies, implementing BL at the institutional level should be achieved while considering potential factors such as BL advocacy, BL definition, BL plan, BL policies, BL programs/courses, BL purpose, BL vision, collaboration, commitment, communication, evaluation, faculty and students' existing ICT skills and experience, faculty and students' perceptions, faculty and students' readiness, faculty and

students' support, funds, incentives and rewards, infrastructure and resources, leadership, professional development, professional staff assistance, services, and time. No one factor is superior to the others, especially because these factors were discussed based on participants' viewpoints, many of which were faculty members as shown in Figure 9. The percentages provided do not mean that one factor is more important than another. Instead, the percentages represent statistical measures for how many authors mentioned each factor in their studies. For a summary of results related to Research Question One, (see Table 9 below), for more details (see Appendix F). A conceptual classification was produced to visually display the institutional factors that were found in the review of the 36 empirical studies. These factors should be taken into account when implementing BL at higher education institutions based on evidence from this study (see Figure 11).

Table 9

Possible Influential Factors in Higher Education to Implement BL with Example Studies

Factors	Example Studies
BL Advocacy	Garrison & Vaughan, 2013; Graham et al., 2013; Crosz, 2014; Mestan, 2019; Porter et al., 2016; Porter et al., 2014; Robison, 2004; Thurab-Nkhosi, 2018; Wang & Han, 2017.
BL Definition	Adekola et al., 2017; Alebaikan, 2010; AlGhanmi, 2018; Garrison & Vaughan, 2013; Graham et al., 2013; Mestan, 2019; Porter et al., 2016; Porter et al., 2014; Robison, 2004; Taylor & Newton, 2013; Thurab-Nkhosi, 2018; Tshabalala et al., 2014; Wittmann, 2006.
BL Plan	Adekola et al., 2017; Aldosemani et al., 2019; AlGhanmi, 2018; Aljahni, 2014; Carbonell et al., 2013; Garrison & Vaughan, 2013; Graham et al., 2013; Kastner, 2019; Medina, 2018; Singleton, 2012; Thurab-Nkhosi, 2018; Wang & Han, 2017.
BL Policies	AlGhanmi, 2018; Aljahni, 2014; Garrison & Vaughan, 2013; Graham et al., 2013; Kastner, 2019; Oh, 2006; Porter et al., 2016; Singleton, 2012; Thurab-Nkhosi, 2018; Thurab-Nkhosi, 2019; Tshabalala et al., 2014; Wang & Han, 2017; Wittmann, 2006.
BL Programs/Courses	Al-Sarrani, 2010; Adekola et al., 2017; Alebaikan, 2010; Blanchette, 2016; Calderon et al., 2012; Garrison & Vaughan, 2013; Graham et al., 2013; Moukali, 2012; Porter et al., 2016; Porter et al., 2014; Robison, 2004; Singleton, 2012; Thurab-Nkhosi, 2019; Wang & Han, 2017.
BL Purpose	Al-Sarrani, 2010; Adekola et al., 2017; Alebaikan, 2010; AlGhanmi, 2018; Aljahni, 2014; Carbonell et al., 2013; Graham et al., 2013; Medina, 2018; Mestan, 2019; Porter & Graham, 2016; Porter et al., 2016; Porter et al., 2014; Singleton, 2012; Suwa, 2011; Taylor & Newton, 2013; Thurab-Nkhosi, 2018; Wittmann, 2006.
BL Vision	Aldosemani et al., 2019; Garrison & Vaughan, 2013; Kastner, 2019; Taylor & Newton, 2013; Thurab-Nkhosi, 2018; Wang & Han, 2017.
Collaboration	Blanchette, 2016; Carbonell et al., 2013; Deutsch, 2010; Garrison & Vaughan, 2013; Grosz, 2014; Kastner, 2019; Taylor & Newton, 2013; Thurab-Nkhosi, 2018.
Commitment	Adekola et al., 2017; Blanchette, 2016; Carbonell et al., 2013; Garrison & Vaughan, 2013.
Communication	Adekola et al., 2017; Calderon et al., 2012; Garrison & Vaughan, 2013; Meyertons, 2006; Singleton, 2012; Suwa, 2011; Wittmann, 2006.

Evaluation	Al-Sarrani, 2010; Alebaikan, 2010; AlGhanmi, 2018; Blanchette, 2016; Calderon et al., 2012; Deutsch, 2010; Graham et al., 2013; Medina, 2018; Mestan, 2019; Peruso, 2012; Porter & Graham, 2016; Porter et al., 2016; Porter et al., 2014; Raphael & Mtebe, 2016; Singleton, 2012; Suwa, 2011; Taylor & Newton, 2013; Villalon & Rasmussen, 2017; Wang & Han, 2017.
Faculty Existing ICT Skills and Experience	Adekola et al., 2017; Alebaikan, 2010, Aljahni, 2014; Blanchette, 2016; Brooks, 2008; Deutsch, 2010; Moukali, 2012; Oh, 2006, Raphael & Mtebe, 2016; Robison, 2004; Suwa, 2011; Taylor & Newton, 2013; Thurab-Nkhosi, 2018; Tshabalala et al., 2014; Villalon & Rasmussen, 2017.
Students Existing ICT Skills and Experience	Adekola et al., 2017; Aljahni, 2014; Moukali, 2012; Oh, 2006, Suwa, 2011; Taylor & Newton, 2013; Tshabalala et al., 2014.
Faculty and Students Perceptions	AL-Sarrani, 2010; Aljahni, 2014; Blanchette, 2016; Brooks, 2008; Peruso, 2012; Porter et al., 2016; Suwa, 2011; Wittmann, 2006.
Faculty and Students Readiness	Blanchette, 2016; Brooks, 2008; Oh & Park, 2009; Taylor & Newton, 2013; Thurab-Nkhosi 2018.
Faculty Support	Adekola et al., 2017; Alebaikan, 2010; AlGhanmi, 2018; Aljahni, 2010; Blanchette, 2016; Carbonell et al., 2013; Deutsch, 2010; Garrison & Vaughan, 2013; Graham et al., 2013; Mestan, 2019; Medina, 2018; Meyertons, 2006; Moukali, 2012; Oh & Park, 2009; Porter & Graham, 2016; Porter et al., 2016; Porter et al., 2014; Raphael & Mtebe, 2016; Singleton, 2012; Suwa, 2011; Taylor & Newton, 2013; Thurab-Nkhosi, 2018; Thurab-Nkhosi, 2019; Villalon & Rasmussen, 2017; Wittmann, 2006.
Students Support	Adekola et al., 2017; Aldosemani et al., 2019; Alebaikan, 2010; Blanchette, 2016; Calderon et al., 2012; Graham et al., 2013; Meyertons, 2006; Medina, 2018; Moukali, 2012; Porter et al., 2014; Robison, 2004; Suwa, 2011; Taylor & Newton, 2013; Thurab-Nkhosi, 2018; Wang & Han, 2017.
Funds	AlGhanmi, 2018; Aljahni, 2010; Graham et al., 2013; Mestan, 2019; Meyertons, 2006; Suwa, 2011; Thurab-Nkhosi, 2018.
Incentives and Rewards	Adekola et al., 2017; Aldosemani et al., 2019; Alebaikan, 2010; AlGhanmi, 2018; Aljahni, 2014; Brooks, 2008; Calderon et al., 2012; Carbonell et al., 2013; Garrison & Vaughan, 2013; Graham et al., 2013; Kastner, 2019; Meyertons, 2006; Oh & Park, 2009; Porter et al., 2016; Porter et al., 2014; Raphael & Mtebe, 2016; Thurab-Nkhosi, 2019.
Infrastructure and Resources	Al-Sarrani, 2010; Adekola et al., 2017; Aldosemani et al., 2019; Alebaikan, 2010; AlGhanmi, 2018; Aljahni, 2014; Calderon et al., 2012; Carbonell et al., 2013; Garrison & Vaughan, 2013; Graham et al., 2013; Kastner, 2019; Medina, 2018; Mestan, 2019; Meyertons, 2006; Moukali, 2012; Oh, 2006; Porter & Graham, 2016; Porter et al., 2016; Porter et al., 2014; Raphael & Mtebe, 2016; Robison, 2004; Singleton, 2012; Suwa, 2011; Taylor & Newton, 2013; Thurab-Nkhosi; 2018; Tshabalala et al., 2014; Wang & Han, 2017.
Leadership	Adekola et al., 2017; AlGhanmi, 2018; Aljahni, 2014; Blanchette, 2016; Carbonell et al., 2017; Garrison & Vaughan, 2013; Graham et al., 2013; Medina, 2018; Porter et al., 2014; Taylor & Newton, 2013; Thurab-Nkhosi, 2018; Thurab-Nkhosi, 2019; Wang & Han, 2017; Wittmann, 2006.
Professional Development	AL-Sarrani, 2010; Aldosemani et al., 2019; Alebaikan, 2010; AlGhanmi, 2018; Aljahni, 2014; Blanchette, 2016; Brooks, 2008; Calderon et al., 2012; Carbonell et al., 2013; Deutsch, 2010; Garrison & Vaughan, 2013; Graham et al., 2013; Grosz, 2012; Kastner, 2019; Medina, 2018; Meyertons, 2006; Moukali, 2012; Oh & Park, 2009; Porter & Graham, 2016; Porter et al., 2016; Porter et al., 2014; Raphael & Mtebe, 2016; Robison, 2004; Singleton, 2012; Suwa, 2011; Taylor & Newton, 2013; Thurab-Nkhosi, 2019; Tshabalala et al., 2014; Villalon & Rasmussen, 2017; Wang & Han, 2017; Wittmann, 2006.
Professional Staff Assistance	AL-Sarrani, 2010, Adekola et al., 2017; Blanchette, 2016; Carbonell et al., 2013, Garrison & Vaughan, 2013, Meyertons, 2006; Porter & Graham, 2016; Porter et al., 2016; Raphael & Mtebe, 2016; Robison, 2004; Singleton, 2012; Thurab-Nkhosi, 2019; Villalon & Rasmussen, 2017; Wang & Han, 2017; Wittmann, 2006.
Faculty Services	Al-Sarrani, 2010; Adekola et al., 2017; AlGhanmi, 2018; Calderon et al., 2012; Graham et al., 2013; Oh & Park, 2009; Raphael & Mtebe, 2016; Singleton, 2012; Suwa, 2011.
Students Services	Adekola et al., 2017; Alebaikan, 2010; Calderon et al., 2012; Oh, 2006; Singleton, 2012, Suwa, 2011; Taylor & Newton, 2013; Wang & Han, 2017.
Time	Adekola et al., 2017; Aldosemani et al., 2019; Alebaikan, 2010; AlGhanmi, 2018; Aljahni, 2014; Carbonell et al., 2013; Kastner, 2019; Mestan, 2019; Meyertons, 2006; Porter et al., 2016; Porter et al., 2014; Singleton, 2012; Suwa, 2011; Taylor & Newton, 2013; Wittmann, 2006.

Figure 11

Possible Influential Factors to Implement BL in Higher Education Institutions Found in the Literature Review

| BL Plan | BL Vision | BL Purpose | BL Definition | BL Programs/Courses | BL Advocacy | Funds |

| Faculty & Student Readiness | | | | | | BL Policies |

| Faculty & Student Perceptions | | | **Possible Influential Factors for Implementation BL at Higher Education** | | | Support |

| | | | | | | Leadership |

| Infrastructure & Resources | | | | | | Professional Development |

| ICT skills & Experience | | | | | | Staff Assistance |

| Time | Evaluation | Services | Commitment | Incentives & Rewards | Communication | Collaboration |

Results for Research Question Two

Research Question Two states, "Based on the literature, how do the factors affecting the implementation of BL align with the work of Rogers's Diffusion of Innovation?" The primary purpose of this question was to determine if there was agreement between the ILR factors identified in response to Research Question One, and Rogers's three classifications for independent institutional variables.

The 23 ILR factors found in the literature were: 1) BL Advocacy, 2) BL Definition, 3) BL Plan, 4) BL Policies, 5) BL Programs/Courses, 6) BL Purpose, 7) BL Vision, 8) Collaboration, 9) Commitment, 10) Communication, 11) Evaluation, 12) Faculty and Students' Existing ICT Skills and Experience, 13) Faculty and Students' Perceptions, 14) Faculty and Students' Readiness, 15) Faculty and Students' Support, 16) Funds, 17) Incentives and Rewards, 18) Infrastructure and Resources, 19) Leadership, 20) Professional Development, 21) Professional Staff Assistance, 22) Service, and 23) Time.

Institutions have uniquely characterizing structures that may influence their innovativeness. Rogers's DoI theory puts forward Rogers' organizational innovativeness model (structure characteristics and organization innovativeness). It includes three categorizations of institutional independent variables which are 1) individual leader characteristics, 2) internal characteristics of institutional structure, and 3) external characteristics of the institution associated with one dependent variable (institutional innovation).

The first categorization is "individual leader characteristics," which has one independent variable: attitude toward change.

1) Attitude toward change (+) refers to existing innovation champions that have a positive influence on institutional innovativeness (Rogers, 2003). An innovation champion is, "a

charismatic individual who throws his or her weight behind an innovation, thus overcoming indifference or resistance that the idea might provoke in the organization" (Rogers, 2003, p. 414). A positive attitude towards change, that is held by an individual or leader, can be an important factor in the initiation of BL innovation for an institution. Rogers articulated that effective champions have properties such as 1) electing to occupy a "linking position" in their institution, 2) possessing logical and conjectural skills in grasping beyond expectations, and 3) exhibiting leading-edge interpersonal skills in debating with others. Rogers (2003) mentioned that the innovation champion is not necessarily the highest authority individual at the institution but may be an individual who is especially clever at communicating with people. Thus, implementing BL requires champions who are able to work for the success of BL implementation in the institution. Authors in their discussions of ILR factors have mentioned that a champion could be a leader in a formal position of authority such as a dean, administrative officer, or department head, or an informal position of authority such as a faculty member or existing BL adopter. This champion has the distinct ability to persuade others about the significance of implementing BL and to lead the initiative. The ILR factors of BL Advocacy supports the importance of this first variable, which is correlated with DoI theory.

The second categorization within Rogers's DoI theory is "internal characteristics of institutional structure," which includes six independent variables: centralization, complexity, formalization, interconnectedness, institutional slack, and size.

1) Centralization (–) refers to the extent to which authority at an institution is controlled by the hands of a limited number of individuals (Rogers, 2003). Higher levels of centralization have a negative influence on the institutional innovativeness (Rogers, 2003). Rogers indicated that centralized leadership could prohibit the adoption of an innovation, but could assist its

implementation. Therefore, lower levels of centralization may facilitate the initiation of BL while higher levels of centralization may facilitate the implementation of BL. The overall effect of centralization on institutional innovativeness is negative although it is not very strong (Rogers, 2003). Thus, in order to implement BL, power should be kept to a moderate level of centralization in the hands of a certain number of individuals (senior leadership). This is because, while strong centralization is a dominating strategy that may ignore the needs of the end-consumer (faculty), the institution still needs centralization to effectively scale up and spread the implementation of BL. Authors discussing ILR factors suggested that decision making regarding the BL environment should be made using both top-down (senior leadership level) and bottom-up (faculty level) processes in order to form a powerful alliance and empower others to move forward. The ILR factor of Leadership aligns with the variable of centralization, and is correlated with the DoI theory.

2) Complexity (+) refers to the extent at which an institution's members have a considerable degree of knowledge and expertise (Rogers, 2003). Rogers (2003) determined that extremely educated members within a workplace are more likely to grasp the value of innovations. According to Rogers (2003), greater complexity may make it more complicated to achieve consensus about implementation. However, the overall effect of complexity on institutional innovativeness is positive, though it is not very strong. In order to implement BL, institutions may promote that possessing ICT skills is a shared responsibility. They may invest in increasing technical and pedagogical knowledge and expertise for faculty and students through professional development and other training activities. Authors discussing ILR factors suggested that faculty members and students should have at least a basic set of ICT skills and experiences needed to use required technologies for BL. They suggested that if faculty and students lack

these basic skills, they will require carefully planned support and programs for training. The ILR factors of Existing ICT Skills and Experience is aligned with the second variable of complexity, which is correlated with the DoI theory.

3) Formalization (–) refers to the extent at which the institution stresses that its members accept rules and procedures in their role performance (Rogers, 2003). According to Rogers (2003) the extent to which the institution is "bureaucratic" is measured by its formalization. Rogers indicated that the formalization attribute has an influence that is very similar to centralization. It impedes initiation but encourages implementation (Rogers, 2003). Thus, the overall effect of formalization on institutional innovativeness is negative in relation to successful adoption. Consequently, to implement BL, a flexible environment is needed to unleash creativity and unite academic staff. This would encourage faculty members to learn about BL and implement it immediately. The presence of a rule handbook regarding employee roles and job descriptions is also needed. Authors discussing ILR factors affirmed the importance of drafting clear institutional policies that designate and enhance BL. However, they have not mentioned the presence of rule handbook regarding employee's role or job descriptions. There are no ILR factors align with the third variable formalization, which is not correlated with the DoI theory.

4) Interconnectedness (+) refers to the extent at which the institution's members are connected by interpersonal networks (Rogers, 2003). According to Rogers (2003), the more interconnected the interpersonal networks, the easier the flow of new ideas among institutional members, which leads to more institutional innovativeness. Thus, to implement BL, institutions may broaden and deepen social networks across institutions via different mechanisms which foster the flow of information on BL adoption and implementation. Authors discussing ILR factors suggested that institutions may provide opportunities to communicate and form

committees for all those involved in the change process (students, faculty, and administration). The ILR factor of Communication is relevant to the fourth variable of interconnectedness, and is correlated with the DoI theory.

5) Institutional slack (+) refers to the "uncommitted resources" that are available to the institution (Rogers, 2003). The more resources an institution has beyond those required for daily operations, the more institutional innovativeness. According to Rogers (2003), the higher the institutional slack, the higher the level of institutional innovativeness, "especially for innovations that are higher in cost" (p. 412). Rogers supposed that larger institutions may be more innovative because they have more slack resources. Thus, to implement BL, an institution should have available financial, material, and human resource slack. Authors discussing ILR factors suggested that having reliable resources and infrastructure along with sufficient funds as well as effective professional staff assistance should be an institutional priority to make the transition to BL more appealing. The ILR factors of BL Funds, Infrastructure, and Resources, and Professional Staff Assistance relate to the fifth variable of institutional slack, which is correlated with the DoI theory.

6) Size (+) refers to the size of the institution itself (Rogers, 2003). The larger size of an institution is positively related to its innovativeness, particularly for innovations that are heavy in cost. Rogers stated that size could be one of the best predictors of innovativeness, and perhaps a surrogate for many factors that guide innovation such as resources, complexity, institutional slack and so on. Thus, to implement BL, the size of the institution should be considerable since larger institutions may be able to invest in expenditures such as new hardware and software technology and resources, better volume production, and the extra manpower necessary for implementation. Authors discussing ILR factors suggested that institutions implementing BL

should strongly consider investment in infrastructure, hardware and software, time, resources, appropriate staff, and training. The ILR factors of BL Funds, Infrastructure and Resources are relevant to this last variable of size, which is correlated with the DoI theory.

The third categorization under Rogers's DoI theory is "external characteristics of the institution," which has one independent variable - system openness.

1) System openness (+) is the extent to which the institution opens itself to new ideas that could solve a problem compared to other institutions (Rogers, 2003). Rogers (2003) mentioned that, "most organizations engage in opportunistic surveillance by scanning the environment for new ideas that might benefit the organization" (p. 422). Thus, to implement BL, the institution should promote information exchange outside of institutional boundaries, learn from successful characteristics of BL at other institutions (best practices), use outside information sources to guide BL delivery (such as higher education standards), collaborate with international universities, or affiliate with other academic institutions to provide training for employees. Authors discussing ILR factors suggested that institutions implementing BL should have a logical purpose behind the transformation, and should recognize the advantages and disadvantages. The authors also discussed different purposes that encourage an institution to adopt and implement BL. The ILR factor of BL Purpose is relevant to this variable of system openness, which is correlated with the DoI theory.

Summary of Research Question #2

Rogers's DoI theory (structure characteristics and organization innovativeness) suggests that the implementation of BL at a higher education institution depends on important institutional structure variables. The results of the ILR factor analysis found that these independent variables from Rogers's DoI theory align with some of the ILR factors such as BL Advocacy, BL Purpose,

Communication, Existing ICT Skills and Experience, Funds, Leadership, Professional Staff

Assistance, Infrastructure, and Resources. For a summary of the results related to research

question two, (see Table 10).

Table 10

Possible Alignment between ILR Factors and Rogers's Institutional Independent Variables

ILR Factors	Rogers's Independent Variables							
	Individual Characteristics	Internal Characteristics of Institutional Structure						External Characteristics of Institutional
	Attitude Toward Change +	Centralization −	Complexity +	Formalization −	Interconnectedness +	Organizational Slack +	Size +	System Openness +
BL Advocacy	√							
BL Definition								
BL Plan								
BL Policies								
BL Programs/ Courses								
BL Purpose								√
BL Vision								
Collaboration								
Commitment								
Communication					√			
Evaluation								
Existing ICT Skills and Experience			√					
Faculty and Student Readiness								
Faculty and Student Perceptions								
Faculty and Student Support								
Funds						√	√	
Incentives and Rewards								
Infrastructure and resources						√	√	
Leadership		√						
Professional Development								
Professional Staff Assistance						√		
Services								
Time								

Results for Research Question Three

Research Question Three states, "Based on the literature, how do the factors affecting the implementation of BL align with the work of Ely's Eight Conditions for Technological Change?"

The primary purpose of this question was to determine if there was agreement between the ILR factors identified in Research Question One and Ely's Eight Conditions.

Ely's significant contribution to the literature was the development of eight conditions that facilitate implementation. The eight conditions were developed by Ely, and include dissatisfaction with the status quo, existence of knowledge and skills, availability of resources, availability of time, rewards or incentives, participation, commitment, and leadership.

1) "Dissatisfaction with the status quo" refers to a time when individuals are not content with the current status, and seek to change or improve it (Ely, 1990, 1999). Ely (1990) identified this condition as one of the early conditions that initiate change. Dissatisfaction is an emotion that requests change (Ely, 1999). This emotional state could be self-induced or state-induced resulting from institutional awareness or marketing campaigns for the necessity for change (Ely, 1999). According to (Ely, 1999), once individuals understand why the current situation is displeasing, they are able to help change or modify it, which increases the connection between inventions and users. Thus, prior to implementing BL, the individuals (senior leadership and/or faculty members) may feel discomfort with using current processes or technologies that may be considered ineffectual, incompetent, or not competitive. Authors discussing ILR factors confirmed that the change process should start with an increasing awareness for the potential benefits of BL and the need for adopting and implementing BL methods to solve a problem. Without awareness, institutions would not recognize a problem, and implementing BL would

seem irrelevant. The ILR factor of BL Purpose is similar to this condition, which correlates with Ely's Eight Conditions.

2) The "existence of knowledge and skills" condition refers to when users have the needed skills and knowledge to use the innovation it (Ely, 1990, 1999). Ely agreed with Verspoor in calling this condition "competence" (Ely, 1990). According to Ely (1990), the fundamental truth is that the basic knowledge and skills should already exist to facilitate the change process. The knowledge and skills could be gained via different avenues such as, "in-service courses, self-instructional programs, tutorial assistance, and formal education" (p. 300). Thus, to implement BL, institutions should consider the importance of acquiring and developing users' technical and pedagogical competencies. Authors discussing ILR factors asserted that institutions should pay special attention to identify faculty and students who possess or do not possess ICT skills and experience in order to respond to needs for support. This support may come through different forms of professional development, professional staff assistance, or 24/7 technical services. The ILR factors of Existing ICT Skills and Experience is relevant to this condition, which correlates with Ely's Eight Conditions.

3) "Availability of resources" refers to when tools and required resources are accessible and convenient (Ely, 1990, 1999). Ely (1990) considered this condition to be the "most self-evident of all" (p. 300). Ely (1990, 1999) mentioned that resources can include financial resources, hardware and/or software, support, and other relevant materials that are not always expensive. In order to implement BL, institutions should consider the general infrastructure and availability of budget. Also, it should consider the human resources and to what extent that professional staff assistance may support the innovation. Authors discussing ILR factors agreed that institutions may realize that significant change is dependent upon having qualified team,

basic physical and virtual infrastructure and keeping in mind implementing BL may cost institutions a lot of money. The ILR factors of BL Funds, Infrastructure, and Resources, Professional Staff Assistance are similar to this condition, which correlates with Ely's Eight Conditions.

4) "Availability of time" refers to when institutions provide users enough time to learn, use, and reflect upon the innovations, along with the user's readiness to devote some of their own personal time to engage in this process (Ely, 1990, 1999). Ely (1990) considered time to undoubtedly be "a resource" (p. 300). Ely (1990, 1999) determined that "good time," "company time," or "paid time" should be provided by the institution where the innovation will be implemented. In order to implement BL, institutions should allow faculty to have enough time to successfully implement the change. Authors discussing ILR factors emphasized that more time would be necessary to fully adopt and implement BL in institutions. The ILR factor of Time is similar to this condition, which correlates with Ely's Eight Conditions.

5) "Rewards or incentives exist" refers to whether intrinsic or extrinsic incentives and rewards are offered as a consequence of applying the innovation (Ely, 1990, 1999). Ely (1999) distinguished between incentives and rewards. An incentive is anything that acts as a stimulus for encouraging individuals to action. A reward is anything provided for higher achievement (Ely, 1999). According to Ely (1990), rewards and incentives may vary for individuals from additional resources to personal assistance. Whether incentives or rewards are intrinsic or extrinsic, they should exist in some form (Ely, 1990). As a result, to implement BL, institutions may provide rewards to faculty members as a method to motivate them to implement BL. Authors discussing ILR factors recommended that institutions offer rewards or incentives to their academic members for hard work during transformation to BL. These might take the form of course completion

certificates, monetary compensation, recognition, tenure and promotion, paid conferences and workshops, or reduced workload. The ILR factor of Rewards and Incentives is similar to this condition, which correlates with Ely's Eight Conditions.

6) "Participation" refers to direct participation when possible, shared decision-making, and communication among all those involved in the process of adopting and implementing an innovation (Ely, 1990, 1999). Ely (1990) suggested that all the potential users of an innovation should participate in the conversation about utilization of the innovation. Ely argued that innovations are sometimes refused or challenged because users are forced to utilize the invention without being involved in the decision-making process. According to Ely (1990), participation could happen at various levels including identifying issues, finding substitute solutions, and reaching decisions when innovative programs are adopted. Ely (1990, 1999) suggested that when direct participation is difficult, it can occur through representatives who can provide feedback from other potential users. Thus, to implement BL, institutions may provide all stakeholders with opportunities to have a sense of ownership over an innovation. Authors discussing ILR factors affirmed that in order to make radical transformations to the BL format, institutions should give all stakeholders a feeling of belonging by involving them in decision making and considering their perspectives. These perspectives contribute to the evolution of the BL approach and the construction of delivery standards. They have also suggested that implementing BL demands engagement at both the administrative and faculty levels with a considerable degree of collaboration. The ILR factors of Collaboration is related to this condition, which correlates with Ely's Eight Conditions.

7) "Commitment" refers to firm and visible support by key players at the institution, such as leadership or the board of directors, for implementation of the innovation (Ely, 1990, 1999).

Blind and simple endorsement of the innovation by those key players does not build commitment (Ely, 1990). According to Ely (1990), a first commitment is initiated by senior leadership, which is then endorsed afterwards by "those who will be affected by innovation." Comments and inputs are collected, and commitment occurs through collaboration at all levels. Thus, to implement BL, institutions may consider visible contributions of commitment such as developing BL strategic plans, dedicating resources, supporting faculty and students, encouraging active involvement of stakeholders, and so on. Authors discussing ILR factors asserted that the sustained commitment of institutional stakeholders is a fundamental component in the implementation of BL, and should be a common goal. The ILR factor of Commitment is similar to this condition, which correlates with Ely's Eight Conditions.

8) "Leadership" refers to the level of ownership and support provided by two branches of leadership: institution leaders and project leaders (Ely, 1990, 1999). Ely (1990) mentioned that institution leaders provide encouragement, support, motivation, and inspiration while project leaders manage the daily work of those using the innovation. After creating the executive board of directors, project directors should be assigned to assist with the implementation since they are closer to the users (Ely, 1999). Consequently, to implement BL, institutions should encourage two-pronged, enthusiastic leadership that provides immediate support, encouragement, consultation, allays concerns, resolves problems, etc. Authors discussing ILR factors contended that there was a need for support from institutional stakeholders when adopting and implementing a BL approach in learning and teaching. This involves senior leadership playing an active role in supporting and communicating the change (top-down process), and faculty members (bottom-up process) playing an active role in ensuring the change or innovation. The

ILR factor of Leadership is similar to this condition, which correlates with Ely's Eight

Conditions.

Summary of Research Question #3

In conclusion, Ely's Eight Conditions suggest that the process of introducing BL into an

institution depends on important administrative conditions that foster the use of innovation. The

results from the ILR factor analysis found that these eight conditions correspond to some of the

identified ILR factors such as BL Purpose, Collaboration, Commitment, Existing ICT Skills and

Experience, Funds, Leadership, Rewards and Incentives, Professional Staff Assistance,

Infrastructure, and Resources, and Time. While some conditions were clearly associated with

ILR factors, others (such as the condition of dissatisfaction with the status quo and participation)

were not. For a summary of the results related to research question three, (see Table 11).

Table 11

Possible Alignment between ILR Factors and Ely's Conditions

ILR Factors	Ely's Condition							
	Dissatisfaction	Knowledge and Skills	Resources	Time	Rewards	Participation	Commitment	Leadership
BL Advocacy								
BL Definition								
BL Plan								
BL Policies								
BL Programs/ Courses								
BL Purpose	√							
BL Vision								
Collaboration						√		
Commitment							√	
Communication								
Evaluation								
Existing ICT Skills and Experience		√						
Faculty and Student Readiness								
Faculty and Student Perceptions								
Faculty and Student Support								

Funds			√					
Incentives and Rewards					√			
Infrastructure and resources			√					
Leadership								√
Professional Development			√					
Professional Staff Assistance								
Services								
Time				√				

Chapter Five: Discussion and Conclusion

This chapter provides a brief overview of the current research study. Following this will be a discussion of the study findings, and presentation of the limitations faced while conducting the study. The contributions of this study to the current literature will also be discussed. Lastly, the chapter offers recommendations for future research and practice.

Study Review

A literature search revealed that little research has been conducted for the purpose of guiding Saudi universities to adopt and implement BL. The current study has attempted to narrow this gap. In order to achieve this purpose, this study employed an integrative literature review (ILR) research methodology inclusive of five phases: (1) the problem identification phase, (2) the data collection phase, (3) the data evaluation phase, (4) the data analysis and interpretation phase, and (5) the presentation of results phase (Cooper, 2017; Whittemore & Knafl, 2005). The rigor demonstrated in the five phases of the design can be explained as follows. In the problem identification phase, a shortage of guidelines and clearly identified factors to consider when implementing BL were clearly identified, and explicit research questions were formulated. The clear development of the research questions guided the literature search in the data collection phase where two research strategies were conducted: the computerized reference database approach and ancestry approach. In addition to this, inclusion/exclusion criteria for the studies were established. In the third phase (data evaluation), the characteristics of the selected studies were defined using two strategies. The methods-description approach and the mixed methods appraisal tool were both conducted to determine the overall quality of the studies. Next, in the data analysis and interpretation phase, the extracted data (possible institutional factors) from each selected study were ordered, categorized, and

summarized in a proximally objective and unbiased manner. Lastly, in the presentation of results phase, a descriptive summary of all institutional factors affecting the implementation of BL, along with their alignment with Rogers's and Ely's works, was developed and presented visually. This visual representation was supported by evidence from the original data sources.

Discussion of Study Findings

The first research question focused on determining what institutional factors supported the implementation of BL in higher education. The second and third research questions discussed how these identified institutional factors aligned with Rogers' Diffusion of Innovations (particularly the three classifications of institutional independent variables) and Ely's Eight Conditions for Change. In this section, the research questions will be discussed using findings from the integrative literature review (ILR). Following this, the institutional factors found through the ILR will be aligned with previously conducted studies.

The first research question stated, "*Based on the literature, what are the factors affecting the implementation of BL*?" Results showed that successful implementation of a new delivery mode demands major contributions from institutions. To facilitate this implementation, administrators or others (change agents) who are responsible for change or implementing innovations, must consider all of the factors that may possibly enhance or derail success.

The BL advocacy factor was identified, meaning that effective BL implementation needs to involve advocacy among administrators, faculty, and other institutional staff. Advocacy may begin as informal in the early phases of implementation, shifting to more formal advocacy in the growth implementation phase of BL. This factor aligns with other studies regarding the importance of identifying and involving institutional BL advocates (Mazer, 2014; Moskal et al., 2013; Vaughan & Garrison, 2006, Owston, 2013).

Regarding the BL definition factor, creating a uniform definition of BL is important to facilitate different institutional purposes, and should allow room for faculty to make pedagogical decisions for their classes. Vaughan et al. (2017) argued that the absence of "a universal definition of BL" could absolutely lead to a lack of common language to describe initiatives or to address possibilities and issues. For successful implementation of BL, there needs to be a clear meaning associated with BL. This way, courses and/or programs that are identified as blended can be widely known and disseminated (Niemiec & Otte, 2010).

The BL plan factor was also identified, meaning that institutions should have a strategic plan when making a fundamental shift to BL delivery modes. The development of this plan could take a long time prior to the implementation of BL. Garrison and Kanuka (2004) distinguished between two processes of planning: strategic and operational. The strategic plan involves determining "needs, goals, and objectives; potential costs; and available resources." The operational involves determining "promotional and advertising strategies; creating relationships for shared resources; managing technology; and creating an effective assessment process" (p. 101). This factor aligns with other scholars' recommendations that institutions should start early to draft an overarching plan for the changes necessary to implement BL (Garrison & Kanuka, 2004; Mazer, 2014; Moskal et al., 2013; Niemiec & Otte, 2010).

In relation to the BL policy factor, institutions may create explicit written policies to meet necessary benchmarks in the transition to BL delivery modes. Key areas such as program/course permissions, copyright legislation, amount of work, incentives system, evaluation procedures, course outlines and schedules, and accessibility matter (Niemiec & Otte, 2010). The identification of this factor was aligned with the work of other researchers calling for the creation

of clear policies with specific institutional rules to provide a consistent BL learning experience (Garrison & Kanuka, 2004; Moskal et al., 2013; Niemiec & Otte, 2010).

Regarding the BL program or course factor, studies often mentioned key procedures aimed at investigating appropriate BL modalities as well as identifying BL courses or programs that are best suited to institutional possibilities. Mazer (2014) argued that institutions are in the awareness/exploration stage of adopting BL if they do not have specific designations for BL courses in their registration or catalog system, but there is a grass-roots movement by individual faculty to implement BL courses. Scheduling BL courses requires significant thought, and both faculty and administrators would need to rethink how BL courses would be provided through a traditional or more flexible format (Garrison & Kanuka, 2004; Ustun, 2018). Considerable thought must be given in order to comply with course scheduling changes and requirements set by the registrar office, which can create significant challenges (Garrison & Kanuka, 2004).

In regards to the BL purpose factor, institutions implementing BL must determine the goals that they anticipate achieving. However, to successfully implement BL, institutions must align their purposes with all stakeholders' goals and values. Scholars affirmed that there is a need to identify specific goals for implementing BL at the institutional level, and to tailor these goals to the needs and objectives of all three constituencies: institution, faculty, and student (Dziuban et al., 2011; Cavanagh et al., 2017; Moskal et al., 2013; Shebansky, 2018).

The BL vision factor can be useful when it aligns with an institution's mission, goals, and objectives. It should be formulated in the best interest of the institution, and certainly collaborative among the constituents. Vaughan et al. (2017) indicated that transformative administrators should be courageous in having an institutional vision for BL, and keep "undeterred in the pursuit of their vision" even when tough decisions are required. A clear vision

with strong support is a requirement when shifting to BL delivery if the success of BL delivery aims to be "a transformational force" across institutions (Dziuban et al., 2011). Scholars emphasized the importance of articulating a shared and understood BL vision across the entire enterprise, while empowering others to communicate this vision (Dziuban et al., 2011; Moskal et al., 2013; Vaughan et al., 2017).

Based on the BL collaboration factor, collaboration is significant to reach BL implementation goals. Administrators may foster communities where collaboration and motivation are respected for all individuals who have the power to make final decisions on procedures regarding the implementation of BL delivery. For example, Vaughan et al. (2017) argued that faculty should not "reinvent the wheel" and develop their own BL courses separately. Instead, opportunities should be given for sharing and exchanging information to build a body of knowledge and relationships that are founded on esteem and support.

In relation to the BL commitment factor, it is important for senior administrators to have the commitment to develop and support BL environments across an institution. VanDerLinden (2014) differentiated between administrator and faculty member commitments towards BL courses. For example, designing BL courses is a faculty member's responsibility while positioning BL as a delivery mode is an administrator's responsibility. Scholars indicated that the role of institutional commitment is crucial to facilitate and hopefully succeed in BL implementation. This is because commitment involves several other important factors such as providing needed resources, support, and continual evaluation (Garrison & Kanuka, 2004; Dziuban et al., 2011; VanDerLinden, 2014).

In regards to the BL communication factor, effective communication amongst administrators, faculty, and students is recommended to solve possible challenges that may occur

during BL courses. Liu and Tourtellott (2011) differentiated between two types of communication: formal and informal. Formal communication involves "a set of scheduled review meetings." Dynamic informal communication is the process of what can be considered "personal communication" (p. 60). The communication factor aligns with other scholars' assertions that effective communication is one of the indispensable essentials needed to have successful implementation of BL (Liu & Tourtellott, 2011; Niemiec & Otte, 2010; Vaughan et al., 2017).

The evaluation factor should also be considered, since it is essential to have ongoing formative and summative evaluation procedures from start to finish when implementing BL. According to Niemiec and Otte (2010), when implementing a BL initiative, carrying out regular evaluation is vital for a couple of reasons. First, the reliability and validity provided through evaluation is designed to accurately inform BL implementation in relation to measurable goals. Second, evaluation provides valuable feedback that can determine whether BL is evolving or requires improvement.

Through examining the factor of faculty and students' existing ICT skills and experience, administrators may play a role in identifying faculty and students' digital literacies and pedagogical experiences to respond to needs for support. This factor conformed with scholars' recommendations that, in order to function effectively while transitioning to BL, the technological foundations and experiences of faculty and students should be assessed, and training provided prior to starting BL courses (Halverson et al., 2017; Liu & Tourtellott, 2011; Poon, 2013).

When considering the faculty and students' perceptions factor, stakeholders' perceptions were found to be beneficial for understanding how the implementation of BL affects their levels

of teaching, learning, interest, and satisfaction. Administrators may show that they value student and faculty perceptions through asking for their help in identifying strengths and weaknesses that they have encountered while experiencing BL (Dziuban et al., 2011; Halverson et al., 2017; Napier et al., 2011; Niemiec & Otte, 2010). According to Vaughan and Garrison (2006), discussions with community members regarding needs, concerns, and fears makes them understand that they are not alone in experiencing the BL format, which can lead them to feel a sense of "trust and risk taking."

In consideration of the faculty and students' readiness factor, administrators may have to diagnose whether all stakeholders are ready and willing to move in the new direction of BL delivery. According to Cavanagh et al. (2017) the combination of strong faculty preparation in terms of training and faculty support resources for delivering BL courses could build an environment of faculty readiness that supports the implementation of BL. The authors also mentioned that student readiness requires transparency of expectations. This could be achieved through a BL orientation and detailed syllabus that discusses different components such as course materials, technology, face to face and online portions, and times and places for class meetings (Cavanagh et al., 2017).

In relation to the faculty and students support factor, institutions seeking to implement BL should make decisions regarding support systems and support network teams that facilitate faculty and students' implementation of BL. Faculty members teaching BL courses should be provided with both technical and pedagogic support - particularly those who are not experienced in online learning (Cavanagh et al., 2017; Jerke & Mosterd, 2017). Similarly, according to Jerke and Mosterd (2017), technical, academic, and student support should be provided to all students that are enrolled in BL courses. Students should have a clear understanding about how, when,

and where they can access technical support. They should be clear about, "library resources, testing/proctoring, tutoring/supplemental instruction, and math and writing centers" that students can access for academic support. Finally, they should also be clear about, "advising, registration, financial aid, student life, counseling" that students can access for general student support (p.106). This factor aligns with the literature emphasizing the importance of providing adequate support for students and faculty during BL implementation (Dziuban et al., 2011; Cavanagh et al., 2017; Jerke & Mosterd, 2017; Niemiec & Otte, 2010).

In connection with the funds factor, budget is a basic component that is needed to establish a successful BL environment. Klein and Knight (2005) stated that, "implementation is, of course, not cheap" (p. 245). According to Garrison and Kanuka (2004), one of the important requirements for any BL initiative to be lasting is the formation of a BL fund to supply the financial support. Financial support motivates and provides assistance to faculty and departments, encouraging them to start BL program/course conversions. Niemiec and Otte (2010) emphasized that institutions should investigate the extent to which BL implementation fits proposed funding, even if it is expected to produce revenue via enrollment growth, since BL could benefit all students and, "not only a select constituency." Moskal et al. (2013) argued that considering BL, "as an investment rather than a cost" causes institutions to consider the future benefits. Thus, they may be motivated to improve teaching experiences by increasing faculty professional development, using classroom resources effectively, providing "convenient and flexible" learning experiences, or keeping up with enrollments by increasing access.

With regard to the incentives and rewards factor, institutions may keep in mind that incentives and rewards are important motivators influencing faculty adoption of BL delivery modes. Scholars have noted the importance of providing faculty with varying incentives and

rewards from their institutions. These rewards can be intrinsic or extrinsic and include things such as professional development opportunities, workload reduction, release time, financing for technical equipment, funding (Garrison & Kanuka, 2004, Previtali & Scarozza, 2019, Wallace & Young, 2010), financial incentives, rewards, or compensations (Previtali & Scarozza, 2019, Shebansky, 2018).

The infrastructure and resources factor was identified as another major item that institutions should be taking into consideration. Specifically, institutions should establish a reliable resource and technological infrastructure to make the transition effective. Scholars underscored the need for adequate accessible infrastructure (Cavanagh et al., 2017, Niemiec & Otte, 2010; Ustun, 2018; Vaughan et al., 2017) and resources (Jerke & Mosterd, 2017; Niemiec & Otte, 2010; Ustun, 2018; Vaughan et al., 2017) while implementing BL.

Leadership was another important factor to consider. Effective institutional leadership is critical to implement BL and move the change forward efficiently. Vaughan et al. (2017) asserted the importance of senior leadership roles in developing BL initiatives that involve all stakeholders such as "students, faculty, administrators, and campus community." This factor conformed with the literature, recommending that strong leadership would be necessary to create changes at institutions (Garrison & Kanuka, 2004; Liu & Tourtellott, 2011; Acree et al., 2017).

Regarding the professional development factor, supporting faculty members by providing professional development courses should be an administrator's priority to prepare them to implement BL. Institutions may offer preparatory courses, training, workshops, or tutorial sessions for faculty members (Cavanagh et al., 2017; Vaughan et al., 2017). This factor conformed with scholars' recommendations that institutions should keep professional development in mind as a major component for faculty seeking to implement BL courses

effectively (Cavanagh et al., 2017; Halverson et al., 2017; Previtali & Scarozza, 2019; Shebansky, 2018; Vaughan et al., 2017).

The professional staff assistance factor was also identified as important. Institutions may provide qualified personnel to assist faculty members and students, when required, to create effective and smooth learning experiences. According to Garrison and Kanuka (2004), when using a new format to deliver instruction, comprehensive assistance for all institutional community constituencies must be ready when needed. This may take the form of competent teams. Scholars in previous work have highlighted the importance of adequate support teams during BL implementation (Cavanagh et al., 2017; Jerke & Mosterd, 2017).

The service factor refers to the idea that constructive implementation of BL requires consistent pedagogical and technological services for faculty and students. Jerke and Mosterd (2017) mentioned that institutions should provide similar training and support to both faculty members who are already versed in online learning and those who are not. The same idea should be applied to students. BL students should be treated as fully online students who will never set foot on campus, and should have easily available access to similar services and support (Jerke & Mosterd, 2017). These support services can be made available in person at a help desk or by telephone, through instant messaging or e-mail, or on a website comprised of tutorials and other resources advantageously offering several formats (Moskal et al., 2013).

In relation to the time factor, it could be useful if institutions devote large amounts of time to incorporating new changes in their delivery modes. Aycock et al. (2002) explained that developing BL courses can take at least six months, so the advice to, "start early and plan very carefully; hybridization is a lot of work" is worth keeping in mind (p. 2). Thus, a critical factor in achieving quality for institutional delivery formats is having sufficient time (VanDerLinden,

2014). This factor complied with scholars' recommendations that developing BL courses may take relatively more time (Akpan; 2015; Aycock et al., 2002; Stein & Graham, 2020; VanDerLinden, 2014; Vaughan et al., 2017).

In sum, based on the evidence shared by many scholars in their examinations of BL implementation, it has been found that there are several essential factors at the intuitional level that must be taken into account in order to conduct a successful transition to BL delivery modes.

The second research question stated, "*Based on the literature, how do the factors affecting the implementation of BL align with the work of Rogers's diffusion of innovation*?" Results showed that institutions have structural features that may influence their innovativeness in favorable or unfavorable ways. The results from applying Rogers's organizational innovativeness model (structure characteristics and organization innovativeness) to this question provided clear guidance for how to increase successful BL implementation at the institutional level.

Rogers's organizational innovativeness model (structure characteristics and organization innovativeness) has three classifications for independent variables (individual leader characteristics, internal characteristics of institutional structure, external characteristics of the institution) that affect a dependent variable (institutional innovation). The first categorization, individual leader characteristics, is related to the independent variable of leader attitude towards change (–). When BL advocators and leaders have particular traits, they can be highly effective at rallying enthusiasm and managing the implementation of BL. The findings from the ILR regarding the factor of *BL advocacy* aligned with Rogers's independent variable (leader attitude towards change). The resulting alignment was supported by Duarte (2016) in his research study stressing the role of advocators in enhancing and arranging BL implementation efforts.

VanDerLinden (2014) also developed multiple guiding questions to help institutions to approach

BL. One of these questions emphasizes the need for contributions by a champion and asks, "Who

is the 'change champion' for blended learning?

The second categorization, internal characteristics of institutional structure, is related to

the independent variable of centralization (–). Making decisions should be collaborative both

from a top-down (senior institutional leadership initiates) and bottom-up (faculty members

initiates) approach. The reason behind this collaboration is that senior leaders will likely

concentrate on the legislative-level, which can far remove them from the working-level that is

able to identify problems and concerns regarding BL implementation. The findings from the ILR

regarding the factor of *leadership* were aligned with Rogers's independent variable of

centralization (–). This alignment was supported by Duarte's (2016) statement that whether, "in

fact BL has been institutionalized, there is a clear indication that the information has not been

properly disseminated throughout the university and throughout faculty/administrator levels" (p.

103).

Internal characteristics of institutional structure is also associated with the independent

variable of complexity (+). Existing faculty members who are professionals with a higher level

of technical and teaching skills are useful, and their experience would be necessary to improve

the quality of BL implementation. The findings from the ILR regarding the factor of *existing ICT*

skills and experience align with Rogers's independent variable of complexity (+). The resulting

alignment was supported by Al-Shohaib's (2009) study investigating the effects of individual,

organizational, and social contexts on adoption of the internet in Saudi public departments. The

author used "level of computer literacy" as a variable to measure complexity, and found that

participants employed few and easy internet features to conduct their tasks, and that they did not

receive adequate training by their workplace. The study concluded that the possession of internet skills and taking training courses were predicted to lead to faster internet adoption time.

The second categorization of internal characteristics of institutional structure is also associated with the independent variable of formalization (–). Formal written policies are important and result in standardized work. However, while authors from the ILR asserted the need for institutional policies to govern the implementation and execution of BL courses/programs (guidelines for BL practices), they did not mention the policies regarding rule manuals, position descriptions, and evaluating the performance of faculty and staff. Thus, there were no ILR factors that aligned with Rogers's independent variable of formalization (–).

Internal characteristics of institutional structure relates also to the independent variable of interconnectedness (+). Bringing all institutional constituencies together for learning and socializing should be encouraged and welcome in order to share and exchange new ideas and expertise concerning the implementation of BL. This community building can influence the adoption of BL. The findings regarding the ILR factor of *communication* correspond with Rogers's independent variable of interconnectedness (+). The results regarding this alignment were supported by Fyvie and Ager (1999), who extrapolated that a pervasive feature of the innovation climate is communication. The cross-communication of thoughts via formal weekly gatherings to discuss project changes were noted to be useful in enhancing social linkages amongst staff.

The second categorization of internal characteristics of institutional structure relates to the independent variable of institutional slack (+). Initiating new technological infrastructure and resources requires sufficient financial resources along with vigorous efforts by human resources. These frame the relationship between individuals and institutions in that all are significant to turn

the wheel of change regarding BL implementation. The findings regarding the ILR factors of *BL funds, infrastructure and resources, and professional staff assistance* were consistent with Rogers's independent variable of institutional slack (+). This alignment was supported by the findings of Ishaq et al. (2013), who concluded that technological infrastructure and resources were the most important and obvious factors that institutions needed to establish. They are a vital determinant in the procedures for the adoption, and are positively correlated to the adoption of technology. Mazer (2014) also found that human resources were a major supporting pillar that drives institutions to complete their goals towards the adoption of BL.

Internal characteristics of institutional structure also relates to the independent variable of size (+). Large institutions with more resources are frequently more innovative as opposed to small institutions. The findings from the ILR regarding the factors of *BL funds and infrastructure and resources* were consistent with Rogers's independent variable of size (+). This alignment was supported by Liu and Tourtellott (2011), who recognized that small institutions are dissimilar to large institutions, who have increased financing, grants, and numbers of registered students. Thus, small institutions may struggle with capacity and innovation. Along with a limited budget, these small institutions may provide "bare-bones" facilities and educational assistance for faculty and students. Also, with limited resources, small institutions have decisions to make when it comes to choosing between a "fast and narrow" or "slow and broad" adoption process.

The third categorization of external characteristics of the institution relates to the independent variable of system openness (+). When members of institutions are associated with others outside the institutional boundaries, they have opportunities to exchange information or imitate ideas to solve institutional problems. This may lead to enhancement for the adoption of

BL at institutional levels. The findings from the ILR regarding the factor of *BL purpose* align with Rogers's independent variable of system openness (+). The resulting alignment was supported by Barry and Alhazmi, (2018) in their discussion regarding international partnerships between Taibah University and George Washington University to adopt BL programs. With this partnership, a new initiative was begun based on international academic standards for Taibah University, and as a way to establish educational excellence, reputation, and economic resources for Washington University.

The third research question reads, "*Based on the literature, how do the factors affecting the implementation of BL align with the work of Ely's eight conditions for technological change?*" Results showed that Ely's eight conditions provided good practical suggestions that would help to implement BL within higher education. The results from applying Ely's eight conditions for change model to this question provided clear guidance on how institutions might implement BL appropriately. Ely's eight conditions for change model consists of dissatisfaction with the status quo, existence of knowledge and skills, availability of resources, availability of time, rewards or incentives, participation, commitment, and leadership.

The first condition of Ely's eight conditions is dissatisfaction with the status quo. When key institutional constituencies feel discomfort from utilizing present delivery modes, and have a sense of urgency and need to change and adopt a new delivery mode, this encourages institutions to implement BL. The findings regarding the ILR factor of *BL purpose* align with Ely's condition of dissatisfaction with the status quo. The alignment was supported by Milad (2019), who stated that faculty adopt BL as the most appropriate way to deliver instruction to students while administrators adopt BL as the most cost-efficient way to deliver instruction to students. Thus, their context determines how they may interpret their discomfort with the status quo.

The second condition is the existence of knowledge and skills. Faculty and students that hold ICT skills, and prior experience with different modalities to deliver and receive learning instruction, contribute to facilitating the implementation of BL practices. The findings from the ILR regarding the factor of *faculty and students existing ICT skills and experience* were aligned with Ely's condition for the existence of knowledge and skills. This alignment was supported by Murphy (2015), who found that community college faculty are significantly affected by whether they have the knowledge and expertise to use certain technologies.

The third condition is availability of resources. Institutions may consider that easy access to materials and human and financial resources are essential to facilitate the implementation of BL. Material resources include physical and virtual infrastructures. Human resources include knowledgeable faculty members, educational technologists, instructional designers, IT specialists, or external consultants. Prescott (2013) found that human resources or, "accessible colleagues or near peers" were some of the major factors perceived as important by members of staff in order to adopt and implement educational technologies. Financial resources are needed to offer support such as intensive professional development courses, continuous customer services, awareness campaigns to advocate for the benefits of the innovation, and the ability to decrease standards of performance while users are learning to use the innovation (Klein & Knight, 2005). The findings associated with the ILR factors *BL funds, infrastructure and resources, and professional staff assistance* were aligned with Ely's condition of availability of resources. This alignment was supported by Murphy (2015), who stated that resources could be whatever might be necessary for proper execution of technology including, "funds, hardware and software, support, and other supplemental materials related to the innovation" (p. 27).

The fourth condition is availability of time. Institutions should consider that implementing the BL delivery mode is time consuming, and requires dedicating adequate time to experimentation. Also, intuitions should provide faculty members with enough time to learn and find out how to implement BL. The findings from the ILR regarding the factor of *time* were consistent with Ely's condition for the availability of time. This alignment corresponds with Klein and Knight's (2005) findings in which the implementation of institutional innovations was found to be arduous due to a lack of time, high costs, and at least initially, heavy workload. This was particularly true for practical implementation, which often involves substantial investments of time and money towards building infrastructure, training users, supervision, and evaluation.

The fifth of Ely's eight conditions is rewards or incentives. Institutions should allocate rewards or incentives for the efforts that faculty members take to implement BL. Rewards and incentives depend upon an institution's system of values (Ely, 1990). The findings from the ILR in relation to the factor of *rewards and incentives* were aligned with Ely's condition with the same name. This alignment was supported by Mirzajani et al. (2014), who suggested that it should be common practice for ICT users to be encouraged, recognized, and respected for the work that they put into utilization of an innovation.

The sixth condition is participation. Institutions should give appropriate attention to all stakeholder comments regarding the implementation of BL and seek to engage them, since this provides a sense of ownership and support as they monitor the development of the implementation. The findings from the ILR corresponding to the factor of *collaboration* were aligned with Ely's condition of participation. This alignment matches Murphy's (2015) description, which suggests that participation is fostered by determining and involving key parties at a variety of levels such as faculty, staff, and administrators.

The seventh of Ely's conditions is commitment. When senior leadership starts to spend part of their time organizing, developing, and launching BL delivery modes, they should have a commitment to finishing it. When they offer "visible and tangible" assistance, the chances of success with the implementation of BL are almost guaranteed. The findings from the ILR regarding the factor of *commitment* were aligned with Ely's condition of the same name. The alignment was supported by Mirzajani et al.'s (2014) findings, in which there was a need established for visible and vocal commitment to innovations from the top institutional level (principal directorial officers) such as leaders, deans, or heads of departments.

The final of Ely's eight conditions is leadership. Institutions may consider the role of leadership to be an active engagement between senior administrators and faculty members to assist with the implementation of BL. Leadership may put forward the need for encouragement, training and resources, a reward system, and so on that are necessary to carry through with the implementation of BL. The findings from the ILR regarding the factor of *leadership* were aligned with Ely's condition of leadership. This alignment was supported by Bland et al.'s (2000) findings that, aside from the senior administrators who are often considered to be leaders, there are also "committee chairs, senior faculty, and associate deans" who can serve as potential candidates to lead innovation.

In conclusion, the findings from this study identified 23 possible institutional factors from the literature. Some of these factors were aligned with Rogers's DoI theory and Ely's conditions, and others were not. With these institutional factors considered as a backdrop, the implementation of BL delivery modes could be successfully achieved at universities.

Study Limitations

While this study offered a valuable opportunity to explore BL institutional factors in higher education, there were several limitations associated with conducting an integrative literature review.

First, the most concerning limitation was that all the data were collected, evaluated, analyzed, and categorized by one person. On the one hand, this served as a way to maintain consistency in the implementation of the approach. On the other hand, it can be argued that a single reviewer may be impacted by biases in their interpretation.

Second, in order to avoid overgeneralization of the review results, it should be acknowledged that the participants, settings, and courses represented in the synthesis do not represent the entire collection of research related to institutional factors affecting the implementation of BL. For this study, only higher education settings were included. This means that the study results are not applicable to other settings, such as in K-12 education or corporate institutions. The findings from this study might be beneficial in providing a grounded starting point. However, those conclusions cannot be carried out without future study.

Third, there is no well-known threshold or guideline regarding the number of studies that should be required when conducting an integrative literature review. However, when the number of studies is small, it has a high potential to become affected by the inclusion and exclusion criteria. This may impact the comprehensive ability of the researcher to answer the research questions.

Fourth, it should be acknowledged that, due to the nature of the integrative literature review, a diversity of methodologies was included in this study for review. Thus, studies that only used specific research design (i.e. quantitative, qualitative, or mixed methods) were not

included in the data analysis, which prevented the ability to examine their special features in detail. Future investigation regarding the same topic may focus on these methodologies to rigorously investigate the identified factors, as well as other factors centered on involving human subjects (administrators, faculty members, students).

The last limitation might be the simple inability to retrieve all the literature on BL implementation. Four electronic databases used in this study were unable to track all documents back from 2000 to 2020. Moreover, electronic databases undergo ongoing changes since the academic institutions modify their subscriptions to journals and databases periodically. This can lead to different results when browsing at different times.

Study Contributions

In recent years, the integration of e-learning components with conventional courses has affected higher education in Saudi Arabia. Currently, the country is making rapid progress towards adopting the most advanced technologies to enhance the educational environment by expanding accessibility and flexibility. The establishment of the National eLearning Center (NeLC) and the Saudi Electronic University (SEU) are compelling proof of this progress. For universities to establish effective educational environments, more emphasis should be placed on adopting and implementing successful BL environments. There are several studies that have examined good practices with the aim of encouraging the effective implementation of BL at the course level, and based on faculty members' perceptions (Aldosemani et al., 2019; AlGhanmi, 2018). However, there are few studies that have examined this at the institutional level (Alebaikan, 2010; Aljahni, 2014;). Thus, this study fills an important gap in the literature regarding the implementation of BL at higher education institutions by focusing on institutional

factors that could influence the implementation of BL, and that reflect upon the various communities being served.

Saudi Arabia's Vision 2030 is a countrywide initiative that aims to shape an evidence based economic system through lowering reliance on oil and expanding towards a dynamic society, prosperous economy, and aspiring country (Saudi Vision 2030, 2019). Improvements in the quality of education via technological innovations have been determined as a major way to reach the Vision of 2030 (Vision 2030, 2019; Nurunnabi, 2017). "In the year of 2030, one vision commitment objective is to have at least five Saudi universities among the top 200 universities in international rankings" (Vision 2030, 2019). In order to achieve this objective, Saudi universities must empower individual learning and enrich digital content by fortifying quality of education with technology integration, ultimately stimulating economic growth (Vision 2030, 2019; Nurunnabi, 2017). This study contributes to Saudi Vision 2030 through assisting Saudi higher education institutions to increase accessibility and flexibility to educational offerings through adopting BL. This can provide students with a variety of options to learn and become more educated citizens.

King Abdulaziz University (KAU) is a leading university in KSA with a privileged position in the Middle East as a result of its considerable number of students. The student population is almost equally distributed males and females (Al-Nuaim, 2012). The university has established a Deanship of Distance Learning (DDL) as an authoritative and academic department charged with advancing the university towards embracing the new and advanced generation of e-learning (Al-Nuaim, 2012; Aljaber, 2018). The implementation of BL environments has been identified by DDL as one of the future plans for King Abdulaziz University (DDL, 2016b). Subsequently the university needs to be clear about its purpose and definition regarding BL

environments. This study will provide institutional factors meant to guide KAU and Saudi higher education institutions with the adoption and integration of BL methods. These factors can assist university administrators who are tasked with implementing BL on campus. Thus, the study will respond to the needs for research about BL as a delivery mode at Saudi universities, and especially at KAU.

From an instructional design point of view, the core of the instructional design and technology field is investigating learning and performance problems at educational institutions in order to improve them. The factors identified through this study can provide talking points for deliberation for policymakers and decisionmakers in Saudi higher education who lack fundamental principles for implementing BL at their universities. University administrators could apply these factors in order to facilitate the implementation of BL and achieve their objectives. These institutional factors fulfill an important role, and range from BL structure, strategies, and support to different faculty and student characteristics. Studying the implementation of an innovation at an institution is worthless without giving regard to the institutional factors that may influence it whether favorably or unfavorably. To assist institutions with their implementation of new delivery modes, the field of instructional design and technology needs comprehensive information regarding what higher education institutions must make provision for before implementing their BL courses or programs. Thus, this study may have practical implications for instructional design practice in relation to BL.

Recommendations

To enhance the implementation of BL at Saudi universities and achieve the "best of both worlds" (traditional learning and online learning), it appears necessary for universities to create a framework that standardizes the implementation of BL delivery across the whole institution. This

framework could be built based on collaborative effort among the National eLearning Center, Ministry of Education, and Saudi university policymakers. Based on the results from this study, there are factors that must be accounted for when designing this framework such as factors related to students' accessibility to learning resources, factors related to ICT infrastructures, factors related to faculty member resistance towards adopting ICT technologies, and so on.

After designing the BL framework, it would seem essential for universities to form specialized teams focused on BL. These teams might include experts such as instructional designers (National eLearning Center) and quality assurance agents (Ministry of Education) internal or external to the university, who can assist and assess university transitions from the awareness/exploration level to the growth/mature implementation level. However, just because the BL delivery mode is set up for success, it does not completely guarantee success. It is crucial to frequently keep an eye on all aspects: institutional goals, funding, infrastructure, faculty members' background and skills, course/programs building, students characteristics such as traditional versus nontraditional, and overall outcomes. Without sustained assistance, commonly made decisions shall not harness the changing possibility of BL. Likewise, without reliable assessment, senior administration shall not have the information to sustain BL (Vaughan & Garrison, 2006).

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Wang, Y., & Han, X. (2017). Institutional roles in blended learning implementation: A case study of vocational education in China. *International Journal of Technology in Teaching and Learning, 13*(1), 16–32. https://files.eric.ed.gov/fulltext/EJ1211997.pdf

Wittmann, H. C. (2006). *Faculty perceptions, conceptions and misconceptions, of factors*

contributing to the adoption of hybrid education at independent institutions of higher education in New York (UMI No. 3215283) [Doctoral dissertation, Dowling College]. ProQuest Dissertation and Theses.

Appendices

Appendix A

Databases Searched for Studies of Blended Learning Implementation

Database	Description	Subject
Education Research Complete from EBSCO*host*	The database has indexed citations, abstracts, and full text from different resources such as journals, books, book chapters, case studies, conference proceedings, etc. since 1865 to present. It covers all field of education from early childhood to higher education. Also, it discusses issues related to curriculum instruction, administration, policy, funding, and sociality.	Education
Education Resource Information Center (ERIC) from EBSCO*host*	ERIC has indexed citations, abstracts, and full text from journal articles, book, conference, government documents, curriculum and teaching guides, theses and dissertations, etc. since 1966 to present. It covers all aria of education and educational research.	Education
JSTOR	JSTOR has archived journals since 1995. It covers different area such as humanities, social science, and sciences. It is not a comprehensive index in any of these disciplines. It includes academic journals, books, and primary source, thematic and open community collections.	Different disciplines
ProQuest Dissertation and Theses Global	The database has archived and disseminated a comprehensive collection of dissertations and theses since 1637. It is an extensive and expanding global archive of dissertations and theses. It provides full-text documents that are available for download in PDF format.	Different disciplines

Note. Adapted from University Libraries [Virginia Tech University]. (2020). *A-Z Databases.* Retrieved June 8, 2020, from https://guides.lib.vt.edu/az.php?a=all

Appendix B

PRISMA 2009 Flow Diagram
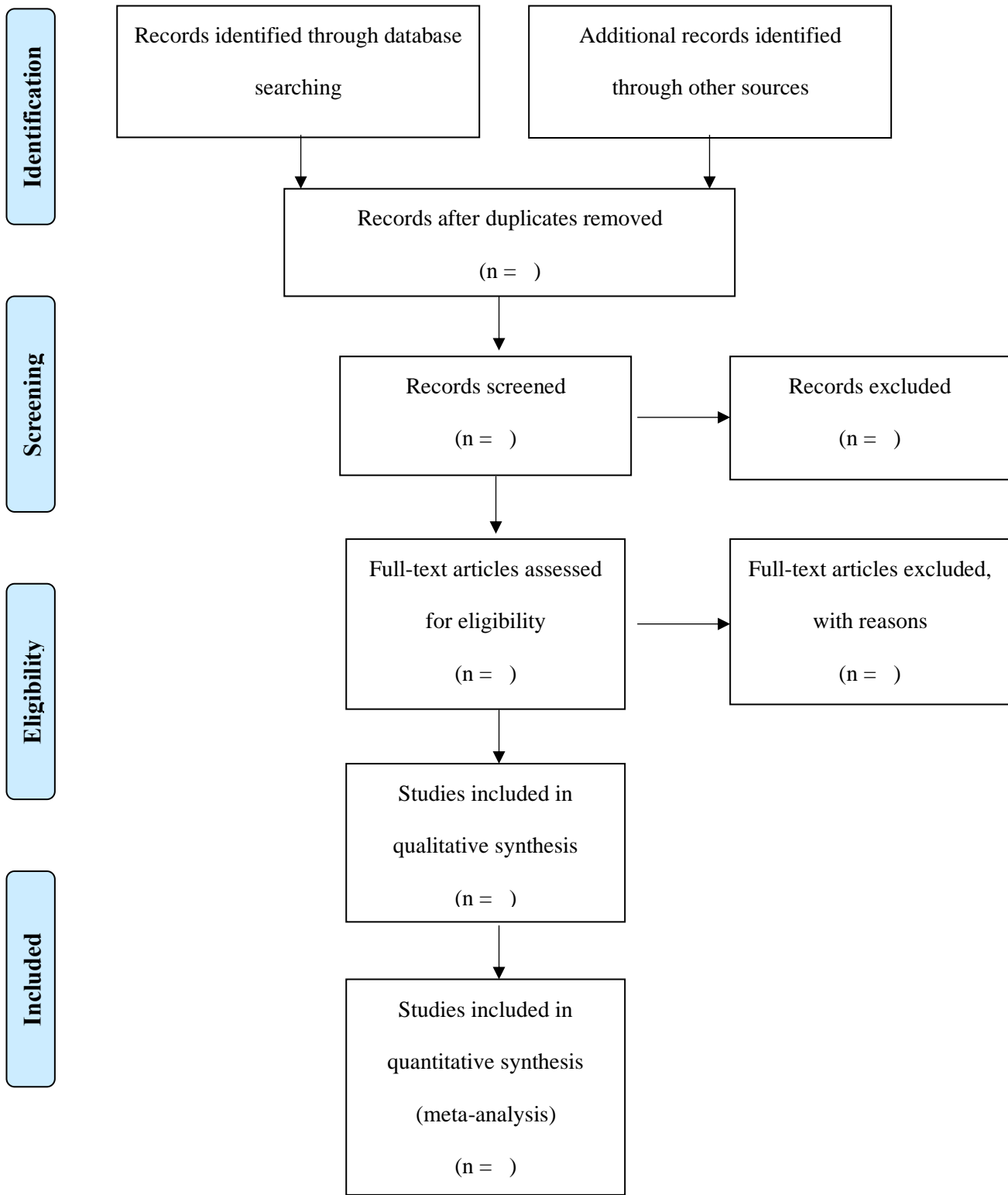
Note. Adopted from Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

Appendix C

Studies used to conduct the Integrative Literature Review

#	Author (s)	Year	Study's Title	Database and Journals
1	AL-Sarrani, N.	2010	Concerns and professional development needs of science faculty at Taibah University in adopting blended learning	ProQuest
2	Adekola, J., Dale, V., & Gardiner, K.	2017	Development of an institutional framework to guide transitions into enhanced blended learning in higher education	ERC Research in Learning Technology
3	Aldosemani, T., Shepherd, C. E., & Bolliger, D. U.	2019	Perceptions of instructors teaching in Saudi blended learning environments	ERIC TechTrends
4	Alebaikan, R. A.	2010	Perceptions of blended learning in Saudi universities	ProQuest
5	AlGhanmi, H.	2018	Female faculty perspectives on blended learning at universities in Saudi Arabia	ProQuest
6	Aljahni, A. A. A.	2014	An evaluation of blended learning in higher education: A case study on the Kingdom of Saudi Arabia	ProQuest
7	Blanchette, K.	2016	Investigating faculty management of shifting roles in blended learning environments	ProQuest
8	Brooks, L.	2008	An analysis of factors that affect faculty attitudes toward a blended learning environment	ProQuest
9	Calderon, O., Ginsberg, A. P., & Ciabocchi, L.	2012	Multidimensional assessment of pilot blended learning programs: Maximizing program effectiveness based on student and faculty feedback	ERIC Journal of Asynchronous Learning Networks
10	Carbonell, K. B., Dailey-Hebert, A., & Gijselaers, W.	2013	Unleashing the creative potential of faculty to create blended learning	Internet and Higher Education
11	Deutsch, N.	2010	Instructor experiences with implementing technology in blended learning courses in higher education	ProQuest
12	Garrison, D. R., & Vaughan, N. D.	2013	Institutional change and leadership associated with blended learning innovation: Two case studies	The Internet and Higher Education
13	Graham, C. R., Woodfield, W., & Harrison, J. B.	2013	A framework for institutional adoption and implementation of blended learning in higher education	The Internet and Higher Education
14	Grosz, T.	2012	Faculty training for blended learning in higher education	ProQuest
15	Kastner, J. A.	2019	Blended learning: Moving beyond the thread quality of blended learning and instructor experiences	ProQuest
16	Medina, L. C.	2018	Blended learning: Deficits and prospects in higher education	ERIC Australasian Journal of Educational Technology
17	Mestan, K.	2019	Create a fine blend: An examination of institutional transition to blended learning	ERIC Australasian Journal of Educational Technology
18	Meyertons, J. E.	2006	An examination of faculty experiences with hybrid formats	ProQuest
19	Moukali, K. H.	2012	Factors that affect faculty attitudes toward adoption of technology-rich blended learning	ProQuest
20	Oh, E	2006	Current practices in blended instruction	ProQuest
21	Oh, E., & Park, S.	2009	How are universities involved in blended instruction?	JSTOR Educational Technology & Society
22	Peruso, F. M.	2012	An analysis of factors affecting student perceptions in a blended learning environment	ProQuest
23	Porter, W. W., & Graham, C. R.	2016	Institutional drivers and barriers to faculty adoption of blended learning in higher education	ERIC British Journal of Educational Technology

24	Porter, W. W., Graham, C. R., Bodily, R. G., & Sandberg, D. S.	2016	A qualitative analysis of institutional drivers and barriers to blended learning adoption in higher education	The Internet and Higher Education
25	Porter, W. W., Graham, C. R., Spring, K. A. & Welch, K. R.	2014	Blended learning in higher education: Institutional adoption and implementation	Computers & Education
26	Raphael, C., & Mtebe, J.	2016	Instructor support services: An inevitable critical success factor in blended learning in higher education in Tanzania	ERC International Journal of Education and Development using Information and Communication Technology
27	Robison, R. A.	2004	Selected faculty experiences in designing and teaching blended learning courses at Brigham Young University	ProQuest
28	Singleton, D. M.	2012	The transition from traditional to blended on-campus learning experience	ProQuest
29	Suwa, B. O.	2011	Provision of support to university students and academics in blended learning: A case study of time, space and pedagogy	ProQuest
30	Taylor, J. A., & Newton, D.	2013	Beyond blended learning: A case study of institutional change at an Australian regional university	The Internet and Higher Education
31	Thurab-Nkhosi, D.	2018	Implementing a blended/online learning policy on a face-to-face campus: Perspectives of administrators and implications for change	ERIC Journal of Learning for Development
32	Thurab-Nkhosi, D.	2019	The evaluation of a blended faculty development course using the CIPP Framework	ERC International Journal of Education and Development using Information and Communication Technology
33	Tshabalala, M., Ndeya-Ndereya, C., & Merwe, T. V.D.	2014	Implementing blended learning at a developing university: Obstacles in the way	ERIC Online Journal of Distance Learning Administration
34	Villalon, C., & Rasmussen, N.	2017	Influence of instructor's attitudes, gender, and technology training when implementing blended learning	ERC National Teacher Education Journal
35	Wang, Y., & Han, X.	2017	Institutional roles in blended learning implementation: A case study of vocational education in China	ERIC International Journal of Technology in Teaching and Learning
36	Wittmann, H. C.	2006	Faculty perceptions, conceptions and misconceptions, of factors contributing to the adoption of hybrid education at independent institutions of higher education in New York	ProQuest

Appendix D

Part I: Mixed Methods Appraisal Tool (MMAT), version 2018

Category of study designs	Methodological quality criteria	Responses			
		Yes	No	Can't tell	Comments
Screening questions (for all types)	S1. Are there clear research questions?				
	S2. Do the collected data allow to address the research questions?				
	Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.				
1. Qualitative	1.1. Is the qualitative approach appropriate to answer the research question?				
	1.2. Are the qualitative data collection methods adequate to address the research question?				
	1.3. Are the findings adequately derived from the data?				
	1.4. Is the interpretation of results sufficiently substantiated by data?				
	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?				
2. Quantitative randomized controlled trials	2.1. Is randomization appropriately performed?				
	2.2. Are the groups comparable at baseline?				
	2.3. Are there complete outcome data?				
	2.4. Are outcome assessors blinded to the intervention provided?				
	2.5 Did the participants adhere to the assigned intervention?				
3. Quantitative non-randomized	3.1. Are the participants representative of the target population?				
	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?				
	3.3. Are there complete outcome data?				
	3.4. Are the confounders accounted for in the design and analysis?				
	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?				
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the research question?				
	4.2. Is the sample representative of the target population?				
	4.3. Are the measurements appropriate?				
	4.4. Is the risk of nonresponse bias low?				
	4.5. Is the statistical analysis appropriate to answer the research question?				
5. Mixed methods	5.1. Is there an adequate rationale for using a mixed-methods design to address the research question?				
	5.2. Are the different components of the study effectively integrated to answer the research question?				
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?				
	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?				
	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?				

#	Strategy	Authors/location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
1	Methods-description Approach	AL-Sarrani, N. KSA 2010	Mixed	"To obtain Science faculty members concerns and professional development needs to adopt BL"	1- There was no association between participants' characteristics "age, academic rank, nationality, country of graduation, and years of teaching experience" and their considerations in accepting BL. 2- There was association between participants based on gender and their considerations in accepting BL. 3- There was no association between participants' perspectives of the impact of utilizing technology on pedagogy and their utilization of technology in teaching. 4- There was association between participants' attitudes towards technology and their utilization of technology in teaching. 5- There was association between participants' perspectives of professional qualification and their utilization of technology in teaching. 6- There were eight themes emerged from participants' responses in adopting BL such as "technical support, technology tools, technology needs, professional development and workshops, student needs, university support, attitudes toward BL, and BL concerns".	S: Establishing the validity of the measurement instrument by "investigating intercorrelation materials, confirmation of expected group differences and changes overtime, and judgments of concerns based on interview data". S: Establishing the reliability of the questionnaire by examining coefficients of internal reliability and the questionnaire's questions was translated to Arabic by an authorized translator and a pilot study was carried out to confirm the reliability of the questionnaire Arabic version. L: Faculty members in science at one university.

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
2	Methods-description Approach	Adekola, J., Dale, V., & Gardiner, K. UK 2017	Qualitative	"To develop a holistic framework to guide institutional transitions into enhanced blended learning"	Developing the framework that is based on semi-structured interviews and informed by a review of literature to guide higher education institutions to translate to BL.	S: Two researchers independently coded the interview transcripts and negotiated a consensus. L: Not identified.

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
3	Methods-description Approach	Aldosemani, T., Shepherd, C. E., & Bolliger, D. U. KSA 2019	Mixed	"To explore instructors' perceptions of BL"	1- The participants' perceptions were positive towards BL. 2- The majority of participants "agreed" or "strongly agreed" with some features of the course management system "Blackboard" they used for BL. 3- The participants did not agree with questions regarding assisting and issues that participants faced as they implemented BL.	S: 4 expert instructors from different fields reviewed the instrument (a questionnaire). S: Establishing the internal reliability of the questionnaire. L: One Saudi university. L: Self-reported data.

				4- It documented major challenges they encountered with BL.				
	MMAT Tool	**S1**	**S2**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
		Yes	Yes	No	Yes	Yes	Yes	Yes
#	**Strategy**	**Authors/location Year**	**Study design**	**Aim of study**	**Major findings**		**Strength (S) & Limitations (L)**	
4	Methods-description Approach	Alebaikan, R. A. KSA 2010	Qualitative	"To explore the perceptions of Saudi female faculty and undergraduate students towards BL based on their experience as participants in BL courses"	Students and faculty perceptions are presented based on their understanding of BL, the advantages of BL, the challenges they experienced, and the future of BL in Saudi Arabia.		S: Establishing trustworthiness, credibility, and transferability by using triangulation, a pilot study, respondent validation method, detailed description of research's context, the research's design, the research's analysis processes, and results. L: Not enough literature review about BL in Saudi Arabia L: Obtaining a documented policy of the implementation of BL in Saudi universities. L: Obtaining detailed data from the participants especially students. L: Having a particular group of students and lecturers from one university. L: Translating the research instruments and collecting data from Arabic to English vice versa all.	
	MMAT Tool	**S1**	**S2**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
		Yes	Yes	Yes	Yes	Yes	Yes	Yes
#	**Strategy**	**Authors/location Year**	**Study design**	**Aim of study**	**Major findings**		**Strength (S) & Limitations (L)**	
5	Methods-description Approach	AlGhanmi, H. KSA 2018	Qualitative	"To understand how BL is used in HE by female faculty members at Saudi institutions, particularly women's colleges"	1- The universities and their faculty members were at the beginning phase of adopting BL. 2- The adoption of BE relied on benefits and challenges that related to faculty members themselves. 3- There was a lack of assistance, weak evaluation plans, and insufficient authorization official leadership rules at the institutional level.		S: Establishing validity in data collection and analysis procedures by sending the transcription to each participant to ensure accuracy (member checking), asking two peer reviewers and advisors for feedback (peer debriefing). L: Most existing studies were in Arabic and translation errors may occur. L: Most of the participants majoring in one field may affect the findings.	
	MMAT Tool	**S1**	**S2**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
		Yes	Yes	Yes	Yes	Yes	Yes	Yes
#	**Strategy**	**Authors/Location Year**	**Study design**	**Aim of study**	**Major findings**		**Strength (S) & Limitations (L)**	
6	Methods-description Approach	Aljahni, A. A. A. 2014 KSA	Mixed	"To assess the status of BL in Saudi Arabia and to identify the obstacles and challenges encountered universities"	1- BL adoption faced some challenges in the KSA context. 2- The eco-system needed for BL was not completed in the university. 3- The combination of face-to-face and online content needed for BL was not in the university. 4- There was a lack of training in utilizing technology.		S: Establishing reliance, reliability and reducing bias by using triangulation (using multiple methods: QUAL and QUAN methods) S: the instruments (students BLEI tool and staff survey) were validated by 12 participants including deans, professors, lecturing staff, and instructional technology experts. S: The instruments were piloted. S: Establishing the reliability of the instruments by using Cronbach's alpha to examine the internal consistency for each item of the instruments. S: Establishing the validity of the instruments by using "a mean correlation coefficient" for each item of the instruments. L: Limited to Saudi universities L: The students involved in this study were traditional students who haven't had experiences with online classes, but they used LMSs in their learning.	

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						L: The advance of technology will make the result of this study limited to specific time.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
7	Methods-description Approach	Blanchette, K. New England 2016	Qualitative	"To investigate faculty members experiences with managing shifting roles in design, development, and instruction of BL"	1- There were barriers and possibilities emerged upon faculty roles pedagogically, socially, and technologically. 2- The barriers were external and external factors such as faculty member disposition and attitude; BL strengths and weaknesses; and BL information and preparation. 3- The possibilities were reorienting institution goals and benefits for BL and concentrating on developing and supporting faculty.	S: Establishing the trustworthiness of data by using multiple sources of evidence to strengthen the construct validity. L: Limited context that was one case site. L: Limited participants that were faculty members without involving student experience with BL. L: Limitation on collecting proof such as bias on reporting.

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
8	Methods-description Approach	Brooks, L. USA 2008	Mixed	"To examine factors that may influence faculty's attitudes toward a BL environment"	1- Participants with more positive attitudes BL had "a positive perception of technology". 2- Rewarding and acknowledgments were important incentives while time requirement for implementing BL was an obstacle.	S: To minimize any such limitation, the assurance of confidentiality and anonymity. S: Establishing triangulation strategy by using open-ended and closed-ended questions. S: The quantitative survey including "faculty attitudes survey, educational technology preferences tools, and personal incentives tool" were adopted from other research studies that were validated. L: Participants may not respond freely and truthfully to the survey questions (self-reports) (internal validity). L: Lack of survey instrument reliability (internal validity). L: Participants came from a single university which may affect the generalization of the findings (external validity). L: Participants were full-time facilitators which may affect the generalization of the findings (external validity).

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
9	Methods-description Approach	Calderon, O., Ginsberg, A. P., & Ciabocchi, L. USA 2012	Mixed	"To describe the process and results of BL outcome assessment"	Students were satisfied with the BL course and the faculty thought their BL courses were adequate in terms of quality.	S: Establishing the validity of the WLP student survey by pre-testing it twice. S: Establishing reliability of both instruments by examining Cronbach Alpha coefficients. S: Utilizing multiple data collection for both student and faculty perspectives. S: Combination of QUAN and QUAL design of the instruments. S: Encompassing feedback from different disciplines at the university S: Replicating the procedures of the study and enhancing the reliability and validity of results through two separate sets of data during two semesters L: Small sample size because it was a pilot project in its first year with modest enrollment.

								L: Low response rate to the assessment instruments because students and faculty were adjusting to both the LMS and the external web-based surveying platforms.	

MMAT Tool		**S1**	**S2**	**Q1**	**Q2**	**Q3**		**Q4**	**Q5**
		Yes	Yes	Yes	Yes	Yes		Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings			Strength (S) & Limitations (L)	
10	Methods-description Approach	Carbonell, K. B., Dailey-Hebert, A., & Gijselaers, W. Netherlands 2013	Qualitative	"To examine four definitive factors for a successful bottom-up change process: the macrocontext, micro contexts, the project leader and the project members"	Bottom-up modification procedure led to three important findings: advent of BL programs that responded to the needs of faculty and students, incentives that were important to resolve institutional problems that just faculty members might be found, and new expertise for the institutes.			S: Establishing the unit of analysis by letting one of the investigators coded all the interviews' conversations and then examined the coding theme with the other one, then the researchers agreed upon the data interpretations. L: Not identified.	

MMAT Tool		**S1**	**S2**	**Q1**	**Q2**	**Q3**		**Q4**	**Q5**
		Yes	Yes	Yes	Yes	Yes		Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings			Strength (S) & Limitations (L)	
11	Methods-description Approach	Deutsch, N. USA 2010	Qualitative (Phenomenological approach)	"To explore instructors' experiences with implementing technology in BL courses in higher education worldwide"	Four themes arose: "Facilitating instruction and learning", "frustrating", "satisfying and rewarding", and "socially connecting".			S: Establishing the reliability by conducting a pilot study. S: Establishing the validity by practice mindfulness "reflection and self-dialogue" before and during the interview between the interviewer and interviewee. S: Establishing the validity by using member checking of the responses to determine the accuracy and provide feedback. S: Establishing the validity also by the personal and professional experience, training, and perspective of the researcher in implementing BL courses (spending prolonged time in the field) S: Establishing the validity by applying triangulation of the data gathering by using numerous resources. L: Geographic challenge limited the study's "location, population, language, and culture". L: The beneficiary audiences were limited to a purposeful selection of participants. L: One instrument for collecting data. L: Self–reported data.	

MMAT Tool		**S1**	**S2**	**Q1**	**Q2**	**Q3**		**Q4**	**Q5**
		Yes	Yes	Yes	Yes	Yes		Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings			Strength (S) & Limitations (L)	
12	Methods-description Approach	Garrison, D. R., & Vaughan, N. D. Canada 2013	Qualitative (case studies)	"To document the institutional change and leadership associated with blended learning innovation in higher education"	The BL program would not have been possible without committed collaborative institutional leadership at all levels of the institution.			Not identified.	

MMAT Tool		**S1**	**S2**	**Q1**	**Q2**	**Q3**		**Q4**	**Q5**
		Yes	Yes	Yes	Yes	Yes		Can't tell	Yes

						There are no quotes provided to justify the interpretation	

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)	
13	Methods-description Approach	Graham, C. R., Woodfield, W., & Harrison, J. B. USA 2013	Qualitative (case studies)	"To explore issues around the adoption and implementation of BL policies in higher education institutions"	A proposed BL adoption framework based on three stages of adoption "awareness, early implementation, and mature implementation" and three broad categories "strategy, structure, and support" may guide universities to adopt and implement BL.	S: The authors guaranteed trustworthiness of the data by examined criterion of credibility and transferability. S: Establishing credibility by triangulation, member checks, and peer debriefing. S: Establishing transferability by providing accurate information of context and rich descriptions of the themes. L: Not identified.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)	
14	Methods-description Approach	Grosz, T. USA 2012	Qualitative (case studies)	"To examine the perceptions and experiences of faculty members registered in a faculty training program"	It was critical to provide top-of-the-line faculty development and workshops that offer an enabling space to implement an innovation such as BL in order to have a positive view and enthusiasm to adopt BL.	S: The author mentioned the goal of 4 cases studies is to generalize a theory analytically, not statistically based on the rich theoretical framework. S: The author mentioned the questions used in the interviews had not caused a conflict of interest for the participants. S: The author mentioned there was no predetermined theories on study findings and no administrative pressure to obtain specific findings. S: Establishing validity and credibility. L: Small sample size and the design of the study may not be generalizable and extended to other populations. L: Not accurate responses since the participants and the researcher knew each other. L: Bias may happen when a researcher has an opinion formed before having the evidence or something to obtain by reaching specific findings.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)	
15	Methods-description Approach	Kastner, J. A. USA 2019	Quantitative	"To examine how faculty members would rate their experiences in BL, barriers of BL, and how skills are acquired to develop and implement BL courses"	Recognizing pressing needs to expand and strengthen the professional development training in HE institutions that offer BL.	S: Establishing the reliability of instrumentation by conducted a pilot study. S: Establishing the validity of instrumentation by utilizing an individual debriefing procedure. L: Employing purposeful sampling may limit fully understanding other faculty members' experience. L: Small sample size may limit generalizing a conclusion of research to a larger population. L: Lack of openness and honest in survey responses. L: Research design limited to only quantitative format.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings		Strength (S) & Limitations (L)	
							There are only 4 incomplete responses that were not utilized in the findings.	

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings		Strength (S) & Limitations (L)	
16	Methods-description Approach	Medina, L. C. Colombia 2018	Qualitative (grounded theory approach)	"To analyze BL cases in HE worldwide to indicate types of blends and the characteristics of BL, its benefits and limitations"	1- Key points must be examined when planning and developing BL programs such as a rationale to blend, learners, instructors, and institutions need, desire, and technology. 2- There were benefits for learners and institutions in terms of customizing the learning experience and cost reductions and increased accessibility. 3- There were deficiencies in implementing BL in terms of the type of blend chosen, the clarity between components in the blend, and the sequencing of these components.		Not identified.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell There is no clear link between data sources, collection, analysis, and interpretation.

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings		Strength (S) & Limitations (L)	
17	Methods-description Approach	Mestan, K. Australia 2019	Mixed	"To assist institutions making similar transitions via a case study of one institution's transition to BL"	1- Both students and academics were receptive to BL and had a clear understanding of what BL was. 2- There was broad variability in the structure and quality of BL and LMS sites used. 3- The appropriate quality of BL required significant investment to provide the university community with time and resources.		S: Establishing triangulation by using three different data collection methods. L: Not identified.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Can't tell There is no reason for conducting the mixed methods was mentioned	Yes	Yes	Yes	Can't tell The survey posed to students was not pre-tested prior to data collection.

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings		Strength (S) & Limitations (L)	
18	Methods-description Approach	Meyertons, J. E. USA 2006	Qualitative (Phenomenological approach)	"To discover common elements of hybrid course formats, grouping these elements into a set of recommendations, and gathering evidence to develop practices to improve faculty use of technology"	Three themes were emerged 1- Faculty attitudes toward technology 2- Differences in teaching and learning that occur in a hybrid format course 3- Pragmatic issues related to implementing hybrid course formats.		S: Establishing the reliability and validity of study by paying close attention to participants' understanding of interview's questions, using rich and extended interpretation of data, and using member checking to confirm the accuracy of the transcribed data. L: Small size of participants. L: Small university, so the results may be not meaningful to faculty who are working under different conditions. L: Participants' abilities or hesitant to keep the interview procedure for any reasons such as time constraints. L: Participants' responses to questions may have "a hidden agenda" which may skew the outcomes.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
19	Methods-description Approach	Moukali, K. H. KSA 2012	Mixed	"To investigate factors and barriers that influence faculty attitudes toward the adoption of technology-rich BL"	1- There were positive attitudes toward BL. 2- Female participants had further obstacles to implementing BL than male participants. 3- Female participants were less skilled in using technologies than male participants. 4- Participants' experience with technology was a major indicator of attitudes that led them to adopt BL. 5- Participants' attitudes toward adoption BL were negatively associated with perceived obstacles. 6- There was a positive relationship between participants' attitudes and perceived encouragement for adopting BL.	S: Establishing the reliability of the instrument by administering a pilot sample then measuring the Cronbach's Alpha coefficient for each item to ensure consistency among them. S: Establishing the validity by developing the survey items based on content validity and reviewing the survey's questions by a specialist and focus group at educational technology. L: Findings limited to one university in KSA, the findings could be not extended to other universities. L: The findings relied on self-reported. L: Participants were not randomly selected. L: There was a communication limitation with some participants. L: The survey was given as "a paper-and- pencil survey" since the lack of technology experience.

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
20	Methods-description Approach	Oh, E USA 2006	Mixed	"To investigate current practices in blended instruction"	1- The study defined blended instruction. 2- It examined instructional activities with blended instruction. 3- It examined the challenges and advantages of blended instruction. 4- It determined the university's assistance and faculty members' attitudes toward blended instruction.	S: Pilot of instruments to confirm reliability (internal consistency) and equivalence of the survey that was distributed online. L: Limiting numbers of administrators who agreed to respond. L: Limiting numbers of faculty members who agreed to respond was only in departments in 20 Schools within 151 extensive doctoral research universities. L: Selecting departments were based on available data on university and faculty web pages. L: Findings could become general to these comprehensive doctoral research universities. L: Using an email message for invitation to participate may affect obtaining an adequate sample.

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
21	Methods-description Approach	Oh, E., & Park, S. 2009 USA	Quantitative	"To examine faculty participation in blended instruction and their perspectives towards it as well as exploring how universities support their faculty in blended instruction and challenges that they were faced"	1- Most implemented blended method (64.4%) was face-to-face instruction with online instructional materials. 2- (95.9%) of faculty participated in designing, developing, and maintaining materials. 3- Most faculty members had positive attitudes towards blended instruction. 4- (70.6%) of faculty workload and (61.8%) of lack of faculty motivation were the biggest challenges. 5- Providing faculty with the necessary support increased the number of online or blended instruction.	S: Establishing reliability and validity of the surveys. L: Not identified

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Can't tell For example, the "instructional delivery formats" question only 127	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
						of the total 133 participants responded the question and the "faculty participation in online course development activities" question only 122. There is no mention how dealt with it statistically.

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
22	Methods-description Approach	Peruso, F. M. 2012 USA	Quantitative	"To measure the perceptions of students towards online learning and blended-hybrid learning"	Students preferred BL courses when they are available because of face-to-face interaction.	S: Establishing reliability of the instruments by conducting a pilot survey to a sample group with similar characteristics of the study group. L: limited to adult students. L: limited to participants who agreed to participate voluntarily. L: Small size sample with one state institution. L: The amount of time was an obstacle to participate in the study.

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
23	Methods-description Approach	Porter, W. W., & Graham, C. R. USA 2016	Mixed	"To determine decisions that facilitate or impede the faculty adoption of BL." "To explore if faculty members' innovation adoption status affects their decisions to adopt BL or not"	Identifying a broad set of factors that significantly affect each category of innovation adopters.	S: Using two categorization methods (1) self-categorization and (2) researcher's categorization as a form of triangulation data sources. S: Establishing content validity of the survey by asking experts and various stakeholders at the university. L: Not identified.

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	No	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
24	Methods-description Approach	Porter, W. W., Graham, C. R., Bodily, R. G., & Sandberg, D. S. USA 2016	Qualitative	"To determine by means of institutional strategy, structure and support measures facilitate or impede the faculty adoption of BL. "To exploring if faculty members' innovation adoption status affects their measures to adopt BL or not"	Institutions of HE should identify and address the necessity of the university educators especially those are early majority and late majority of adoption BL.	S: Establishing credibility by obtaining feedback from colleagues regarding the study's method, analysis, and conclusions and addressing any biases (peer debriefing). S: Establishing transferability by providing a rich context regarding the study's results. S: Establishing dependability by saving an audit trail during dealing with data, analysis, and results. S: Establishing confirmability by comparing findings with other research findings. L: Not identified

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)

25	Methods-description Approach	Porter, W. W., Graham, C. R., Spring, K. A. & Welch, K. R. USA 2014	Qualitative (11 case studies)	"To examine issues surrounding transitioning between awareness of BL to the adoption implementation of BL in U.S. institutions of higher education"	Identifying themes as regards "institutions' strategy, structure, and support" issues through the transformation.			S: Ensuring trustworthiness by establishing credibility and transferability S: Promoting credibility by triangulation using multiple sources of information such as "reviewing the literature, semi-structured interviews, and institutional documents, member checking, and peer debriefing". S: Promoting transferability by providing accurate information and comprehensive explanation of the themes. L: Not identified.
	MMAT Tool	**S1**	**S2**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
		Yes	Yes	Yes	Yes	Yes	Yes	Yes
#	**Strategy**	**Authors/location Year**	**Study design**	**Aim of study**	**Major findings**			**Strength (S) & Limitations (L)**
26	Methods-description Approach	Raphael, C., & Mtebe, J. Tanzania 2016	Mixed	"To investigate the effectiveness of faculty members' support to the delivery of BL courses"	Lack of technical and pedagogical support were major obstacles that inhibited faculty from implanting BL courses.			Not identified.
	MMAT Tool	**S1**	**S2**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
		Yes	Yes	Yes	Yes	Yes	Yes	Can't tell The questionnaire was not pre-tested prior to data collection
#	**Strategy**	**Authors/Location Year**	**Study design**	**Aim of study**	**Major findings**			**Strength (S) & Limitations (L)**
27	Methods-description Approach	Robison, R. A. USA 2004	Mixed	"To examine faculty members' experience regarding designing and implementing BL courses at Brigham Young University"	1- Identifying reasons that faculty members used BL. 2- There was no consensus definition of BL. 3- The design of blended learning was varied. 4- Meeting the goals by employing the best technological tools to help students. 5- Identifying benefits as reasons for having BL 6- Identifying potential shortcomings of BL and how to address them.			S: Maintain accuracy by recording all interviews, each participant was mailed with a copy of the transcript to review. S: Establishing reliability of the finding themes by requesting a review from a professor who is expertise in the field of BL, then each participant was mailed with a copy of final transcript to review and approval. S: The questions in the survey were pilot- tested. L: A minority of participants had considerable experience with BL. L: Lack of campus-wide acceptance of BL. L: Not known how widely utilized the BL will become since the participants used it slightly. L: Inadvertent oversights and personal biases since both researcher and participants from the same university.
	MMAT Tool	**S1**	**S2**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
		Yes	Yes	Yes	Yes	Yes	Yes	Yes
#	**Strategy**	**Authors/Location Year**	**Study design**	**Aim of study**	**Major findings**			**Strength (S) & Limitations (L)**
28	Methods-description Approach	Singleton, D. M. 2012 USA	Mixed	"To explore the transitional process of BL from the aspect of cultural change issues and impact of change on delivery time and curriculum"	Identifying nine major themes including: "technological infrastructure, course format changes, communicating the change, training faculty, the common course shell, workload changes, cultural impacts, communication, and evaluation of the transition".			S: Establishing instrument validation by requesting experts' reviews. S: Establishing triangulation of data collection by using a mixture of qualitative and quantitative data. L: Not identified.
	MMAT Tool	**S1**	**S2**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
		Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings			Strength (S) & Limitations (L)	
29	Methods-description Approach	Suwa, B. O. 2011 Australia	Qualitative (grounded theory)	"To document and reflecting crucial concerns about effective and efficient support for both students and academics utilized BL"	1- Identified three major themes that emerged from students' perspective: "time, space and pedagogy." 2- Identified sub themes of the three major themes that emerged from academics' perspective: "workload support factors, technological support factors, institutional and policy support factors, and student–student support factors."			S: Establishing validity and trustworthiness of the data by utilizing a great deal of references for the data gathering. S: Conducting a rich explanation of participants' experiences by using grounded theory. L: Lack of honest responses, participants' stories may oftentimes ambiguous. L: Small focus groups might not illustrate the overall views of larger groups.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings			Strength (S) & Limitations (L)	
30	Methods-description Approach	Taylor, J. A., & Newton, D. Australia 2013	Qualitative (case study)	"To identify facilitators and barriers to implement BL"	1- The major barrier to implementing BL was government policy regarding institutional funding. 2- The principal facilitator was the senior leadership at the university who initiated and sponsored the project.			Not identified.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Can't tell There is no clear data analysis used	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings			Strength (S) & Limitations (L)	
31	Methods-description Approach	Thurab-Nkhosi, D. Trinidad and Tobago (the Caribbean's island states) 2018	Qualitative (case study)	"To concentrate on the stage of BL implementation and the perceptions of administrators regarding issues related to implementation of BL"	1- Confirming the importance of employing the change management strategies. 2- Confirming the administrators' responsibility is to select leaders for a couple of reasons: support the initiative of BL, source funds for the implementation of BL, and check hardware and software available on the campus. 3- Confirming the Senior management responsibility is to provide support for developing the initiative of BL.			Not identified.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings			Strength (S) & Limitations (L)	
32	Methods-description Approach	Thurab-Nkhosi, D. Trinidad and Tobago (the Caribbean's island states) 2019	Mixed	"To evaluating the impact of a professional development faculty course to deliver BL based on CIPP evaluation model (context, input, process, product)"	Completing the professional development course resulted in faculty members confidence in their technical skills and using technology for teaching have increased as well as their implementation of BL courses have improved.			L: Not identified. S: Establishing triangulation of data collected methods.	

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell There is no mention about the validation of the survey instrument used

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
33	Methods-description Approach	Tshabalala, M., Ndeya-Ndereya, C., & Merwe, T. V.D. South Africa 2014	Qualitative (case study)	"To explore the perceptions of faculty members after adopting BL as well as identifying challenges they faced"	Identified themes and sub-themes regarding various academics' perceptions towards the adoption of BL: "understanding of BL, external factors, perceived usefulness, perceived ease of use, and attitude towards using BL."	Not identified.

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell There is no clear link between data collection and analysis

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
34	Methods-description Approach	Villalon, C., & Rasmussen, N. USA 2017	Quantitative	"To examine the relationships and differences between faculty members' attitudes toward BL implementation and their self-reported hours of technology training based on gender"	1- There was a statically considerable association between six domains of faculty members' attitudes toward BL implementation and faculty members' degree of technology training. 2- There was not statistically difference in degree of technology training for BL held by gender.	L: The finding of the study may not be generalized because the results related to faculty members in one university located on the southwest region of US that may not be impracticable to other areas and large population L: Small size of participants who taught BL courses and interested to participate. L: Participants' ability to respond openly and honestly. L: Purposive sample may not represent other participants characteristics who were not included.

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Can't tell There is no information related to the survey that was pre-tested prior to data collection.	Yes	Yes

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
35	Methods-description Approach	Wang, Y., & Han, X. China 2017	Mixed	"To examine an education institution's roles in BL implementation"	Identifying the roles of the institution based on six subsystems in the BL implementation: institution, technology, teacher, content, learning support, and learners.	S: Establishing accuracy and validity: triangulating the data by referring to the relevant literature and cross-checking. L: Not identified.

MMAT Tool	S1	S2	Q1	Q2	Q3	Q4	Q5
	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell There no clear survey questions or survey test for validity and reliability

#	Strategy	Authors/Location Year	Study design	Aim of study	Major findings	Strength (S) & Limitations (L)
36	Methods-description Approach	Wittmann, H. C. USA 2006	Mixed	"To examine known factors that affect the adoption of hybrid courses by faculty members."	1- Identifying the factors "technology, pedagogy, faculty-centered issues, and institutional policies" have a degree of effect on faculty members' decisions to develop and implement hybrid courses.	S: Establishing content validity by selected 4 jurors who are experts in distance education and face to face education to judge the survey's content. S: Establishing the reliability of data collected by applying some statistical tests.

				To examine faculty conceptions and misconceptions of hybrid courses that affect the adoption of hybrid courses"	2- The faculty members' conceptions and misconceptions based on 13 questions had a degree of effect on faculty members' judgment to improve and perform hybrid courses which emphasize the need for more training and support.		L: The finding is limited to 4 universities of higher education in New York. L: The finding is limited to information gathered from a self-reported survey.	
MMAT Tool	**S1**	**S2**	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	
	Yes	Yes	Can't tell There is no clear reason for conducting the mixed study	Yes	Yes	Yes	Yes	

Appendix F

Examples of Possible Influential Factors in Higher Education to Implement BL from the ILR Studies

Factors	Examples	Authors
BL Advocacy	"The process must begin with raising **awareness of the benefits and necessity** of adopting **blended learning** approaches"	Garrison & Vaughan, 2013
BL Definition	"blended learning requires a clear understanding of this concept including a selected **definition**"	Alebaikan, 2010
BL Plan	"need for **a strategic plan** to adopt BL in each institution, including a method of evaluation, and the need to be aware of negativity when adopting BL"	AlGhanmi, 2018
BL Policies	"consideration is needed at the institutional level about how to adapt and change such **policy** to reflect these practices"	Kastner, 2019
BL Programs/Courses	"Design demo courses of blended learning to give faculty members and students a **clear picture about blended learning** in general, and its advantages in particular"	Moukali, 2012
BL Purpose	"the availability of sufficient infrastructure, technological support, pedagogical support, evaluation data and **an institution's purpose** for adopting BL"	Porter & Graham, 2016
BL Vision	"Strategic institutional change will only happen if there is **a shared vision** and energy that touches all parts of an organization"	Taylor & Newton, 2013
Collaboration	"**collaboration** is important to develop a measurable project goal"	Carbonell et al., 2013
Commitment	"the adoption of transformational blended learning approaches demands clear organizational plans, strong leadership, and **sustained commitment**"	Garrison & Vaughan, 2013
Communication	"As with planning, **communication** should be an integral part of the transitional process"	Singleton, 2012
Evaluation	"It is critical that time, resources and **evaluation procedures** are adequately attended to by both universities and the academics"	Suwa, 2011
Faculty Existing ICT Skills and Experience	"the importance of the blended learning **professor's aptitude for technology** and its correlation to the potential for a successful blended learning course"	Robison, 2004
Student Existing ICT Skills and Experience	"making sure that students admitted to a program possess the **minimum skills** and equipment necessary to use its required learning **technologies**"	Suwa, 2011

Faculty Perceptions	"the importance for administrators to learn more about faculty, **their perceptions**, and experiences with education, students, technology, and blended learning in order to meet faculty needs for support and development"	Blanchette, 2016
Students Perceptions	"retention and future enrollments could be affected by **student perceptions** of the quality and convenience of the learning experience"	Peruso, 2012
Faculty and Students Readiness	"Accompanying this top-down approach was a groundswell of **readiness**"	Taylor & Newton, 2013
Faculty Support	"**instructors must be well supported** from the institutions through various support mechanisms"	Raphael & Mtebe, 2016
Students Support	"providing adequate ongoing **technical and pedagogical support** not only for teachers, but also for BL **students** who may lack the necessary skills to thrive in a BL classroom"	Porter et al., 2014
Funds	"Blended learning is not an avenue that institutions should pursue to cut costs, as it requires considerable **investment** to implement well"	Mestan, 2019
Incentives and Rewards	"Institutions should consider providing **incentives** to BL adopters"	Porter et al., 2014
Infrastructure and Resources	"Blended learning practice requires **adequate resources** including the provision of adequate computer equipment to enable a range of delivery methods to enhance academics' teaching"	Suwa, 2011
Leadership	"**Administrative officers have a responsibility** for sharing information impacting resources and student support issues"	Thurab-Nkhosi, 2018
Professional Development	"the need for **continuing faculty development support** and building administrative support for faculty development"	Thurab-Nkhosi, 2019
Professional Staff Assistance	"At the implementation level, the institute superintended the formation of a **BL team** to guide the process of course design"	Wang & Han, 2017
Faculty Services	"without **technical support that is available 24/7**, Science faculty cannot be able to go further in the process of adopting BL"	Al-Sarrani, 2010
Students Services	"The IT staff members of the College were **available at lab time for technical assistance**"	Alebaikan, 2010
Time	"**Change does not happen quickly**, and administration must balance the reality of a slower transition for more quality course production"	Singleton, 2012