

A Managerial Perspective on Institutions Administration Readiness to Diffuse Blended Learning in Higher Education: Concept and Evidence

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Abstract

There has been rapid development in Blended Learning (BL) diffusion and prior studies mainly focused on issues related to students and lecturers in improving teaching and learning outcomes, but very few studies focused on institution's readiness and diffusion issues. Thus, there is need for institutional-based research to guide universities, colleges, and polytechnics to strategically diffuse BL. Accordingly, this study develops a model to investigate the variables and associated factors that influence institutions administration readiness to diffuse BL initiatives based on Diffusion of Innovation (DoI) theory and institutional BL adoption framework that comprises of mature implementation stage of BL. Quantitative research approach was employed and data was collected using online survey questionnaire from 223 e-learning administrators/managers in Malaysia universities, colleges, and polytechnics. Next, Partial Least Square-Structural Equation Modeling (PLS-SEM) technique was employed for data analysis. Results indicate that institutional structure, resource support, technology infrastructure, management strategies, and ethical considerations are key variables that positively predict administration readiness to diffuse BL initiatives in higher education. Additional results from Importance Performance Map Analysis (IPMA) in PLS-SEM suggest that institutional structure has the strongest effect on administrators' readiness to diffuse BL and is also the most important variable that influences BL diffusion in institutions. Theoretically, findings from this study provide insights on how institutions' administration perception and acceptance of BL approach can be enhanced. Practically, the developed model can be employed as a readiness tool to assess institutions current state in implementing BL environment and further provides a road map for future improvement.

Keyword: Technology in education; Blended learning; Institutional diffusion; administration readiness; Higher education policy.

1. Introduction

Nowadays, Blended Learning (BL) adoption is increasing in higher education across the world and it involves the integration of two distinct paradigms which combines classroom and online learning activities in an optimal approach to improve student learning outcomes (Kuar, 2013). BL aims to address important institutional issues by integrating offline and online modes to ensure the efficient utilization of course resources to achieve teaching goal and learning objectives (Carbonell, Dailey-Hebert, and Gijsselaers, 2013). Institutions are now initiating policies that support BL adoption by increasing their commitment to enhance student learning as well as create access to learning materials, provide flexible learning modes, and offering cost effectiveness e-learning platforms (Dakduk, Santalla-Banderali, and van der Woude, 2018; Ghazal, Al-Samarraie, and Aldowah, 2018). Conversely, despite the benefits provided by BL, many institutions have failed to successfully adopt BL for teaching and learning due to issues related to increase cost of technology, poor decisions strategy, inadequate support, and absence of a comprehensible strategy

(Graham, Woodfield, and Harrison, 2013; Tamim, 2018). Thus, there is need for administration full involvement if BL adoption is to be successfully diffused in higher education (Moskal, Dziuban, and Hartman, 2013).

Furthermore, it is required for institutions to provide devoted services to support students in learning with BL and lecturers throughout their pedagogical design and use of BL to create course modules for teaching (Machado, 2007). This comprises allocating resources to support lecturers and students to become actively involved and fully aware of BL initiatives (Poon, 2014). Moreover, BL adoption in higher education is effective when the institution administration is dedicated to improving the quality of student academic experience in a cost-effective approach (Moskal et al., 2013). Technology mediated learning is then viewed as a medium of attaining institutions strategic goal (Graham et al., 2013). Although, it is challenging to allocate resources and align policies to meet strategic goal of re-designing BL courses, as this leads to resistance to institutional change which was mentioned as one of the major reasons why institutions failed to restructure their educational policies (Chong, Cheah, and Low, 2010). Similarly, academicians such as Alshehri (2017) stated that it is inevitable that lecturers and students will implement BL approaches in a significant way if there are clear policies to direct and guide BL adoption. Accordingly, institutions aiming to improve their current BL initiatives may consider enhancing their technical support and infrastructures to address the needs of students and lecturers (Graham, 2013). They may also recruit existing BL experts from other institutions to assist with professional development (Porter, Graham, Bodily, and Sandberg, 2016).

Additionally, Al-Rahmi et al. (2018) argued that institutions are faced with governance issues when they diffuse BL approaches for teaching and learning and these issues includes 84.5 percent inadequate human resource, 11.5 percent less top management support, and 69.2 percent lack of incentives. Thus, Al-Rahmi et al. (2018) recommended for a robust governance policy to promote BL planning responsibilities and implementation. Accordingly, for BL approaches to be seen as part of the institutional academic objectives, the faculties must be ready to translate BL policy into actual BL implementation for teaching and learning activities (Machado, 2007). Hence, administration must specify precise roles that BL should play in institutional development agenda in offering proper direction for planning and operation of BL approaches (Mercado, 2008). Administration need to outline existing options on how to diffuse BL approaches in teaching, for example by providing guidance on different dimensions of BL, and more recognized pedagogic strategies (Basir, Ahmad, and Noor, 2010).

Evidently, BL adoption in higher education has become an imperative issue for many institutions (Dziuban and Moskal, 2011; Spring, Graham, and Hadlock, 2016). Likewise, one of the challenges of higher education is to evaluate the readiness of institutions administration towards initiating policies that progress BL (Machado, 2007; Mercado, 2008). Although, the success of BL in institutions may be initiated by lecturers and students' diffusion, however BL survival is based on the readiness of administration (Al-Busaidi, 2012). Moreover, there has been rapid growth in research and development in BL and most studies are mostly focused on improving teaching and

learning effectiveness of students and lecturers (Graham et al., 2013; Porter et al., 2016). Yet, only fewer studies have explored BL from institutions administrator's perspective (Porter, Graham, Spring, and Welch, 2014; Smith and Hill, 2018). Thus, there is need for research focused on institutional BL policy and diffusion issues to help guide administrators to strategically diffuse BL in their respective institutions (Graham et al., 2013). Likewise, academicians such as Graham et al. (2013); Ghazal, Al-Samarraie, and Aldowah (2018) calls for studies that examines the specific influential variables and related factors that predicts administrations' readiness to institutionalize BL. Consequently, more empirical evidence is required to clearly depict how certain technological, institutional, and individual related variables can contribute to administrators' readiness in diffusing BL (Moskal et al., 2013). Similarly, Fesol and Salam (2016) highlighted that there is need for institutions to develop BL policies that provide comprehensive guideline for initializing and diffusing BL approaches for academic activities.

Furthermore, prior BL studies investigated administrator perception towards BL in individual institutional context, but there are limited studies that examined universities, colleges, and polytechnics diffusion of BL concurrently (Mercado, 2008; Basir et al., 2010). Hence, there is need for a study that examines administrators' readiness from several institutions such as universities, colleges, and polytechnics. Accordingly, this study addressed the following research questions:

RQ1-Which variables and associated factors influence administrators' readiness to diffuse BL?

RQ2-How to assess e-learning managers and administrators' readiness to diffuse BL?

RQ3- What are the importance and impact levels of the identified variables?

In response to these research questions, this study develops a model to investigate the variables and related factors that influence institutions administration readiness to diffuse BL initiatives based on Diffusion of Innovation (DoI) theory and institutional BL adoption framework. The remainder of the study is structured as follows. Section 2 is the literature review. Section 3 is the model and hypotheses development and Section 4 describes the research methodology. Section 5 is the results and discussion, Section 6 is the implications of study and Section 7 is the conclusion.

2. Literature Review

2.1. Background of Blended Learning in Malaysia Higher Education

Based on the Malaysian Nation Vision 2020 to become a developed nation, the Malaysian Ministry of Higher Education (MOE) developed a National Education Blueprint (2013-2025) (Edward, Asirvatham, and Johar, 2018), which is also part of the Vision 2020 of the country aligned with cultivating science and technology educational policy as one of the significant drivers for attaining the Nation Vision 2020 (Siew-Eng and Muuk, 2015). One of the plans of MOE regarding the Education Blueprint 2013-2025 is the government's targets of introducing Information

Communication Technology (ICT) innovations to facilitate teaching and learning activities by acknowledging the prominence of ICT to improve teaching pedagogies and curriculum development (MOE, 2015). Accordingly, institutions in Malaysia have positively responded to this plan by implementing in-house e-learning platforms and Face-to-Face (F2F) physical class room learning (Tan and Neo, 2015). Similarly, universities, colleges, and polytechnics in Malaysia have begun to facilitate conventional teaching approaches with online learning environments, thus answering the call by MOE to utilize ICT in teaching and learning for creating innovative and capable graduates (Tan and Neo, 2015).

In a bid to foster diffusion of BL approaches in institution, Malaysia government supports BL initiatives by providing ICT infrastructure to all institutions (Ta'a, Bakar, and Shahbani, 2017), restructures their current curriculum, and provides seasonal assessments after conducting workshop and training for academic staffs to improve their skills and knowledge in utilizing ICT for teaching (Tahar et al., 2013). Respectively, to translate the national education blueprint (2013-2025) into tangibles outcomes, deployment of technology mediated learning applications such as Open Distance Learning (ODL) and Massive Open Online Course (MOOC) are being implemented by institutions in Malaysia to promote non-formal learning and professional development among students (Isa et al., 2015). Also, these institutions are utilizing other platforms such as Modular Object-Oriented Dynamic Learning Environment (Moodle) which is a free open-source e-learning system (Lança and Bjerre, 2018).

2.2. Overview of Diffusion of Innovation Theory

Diffusion of innovation (DoI) theory was developed by Rogers (2003) to offers in-depth investigation of how new innovations are diffused, and how adoption decisions are affected by perceptions of end user towards technology as well as the characteristics of the adopting institution and its environment. Respectively, Rogers (2003) defined diffusion as the progression by which an innovation is deployed through various channels over time across members of a collective system (Porter et al., 2016). Rogers categorized innovation adopters into five groups based on shared values and characteristics which include innovators, early adopters, early majority, late majority, and laggards (Porter and Graham, 2016). In the context of BL, DoI theory can be employed to provide guidance as to how BL adoption in institutions can be accelerated.

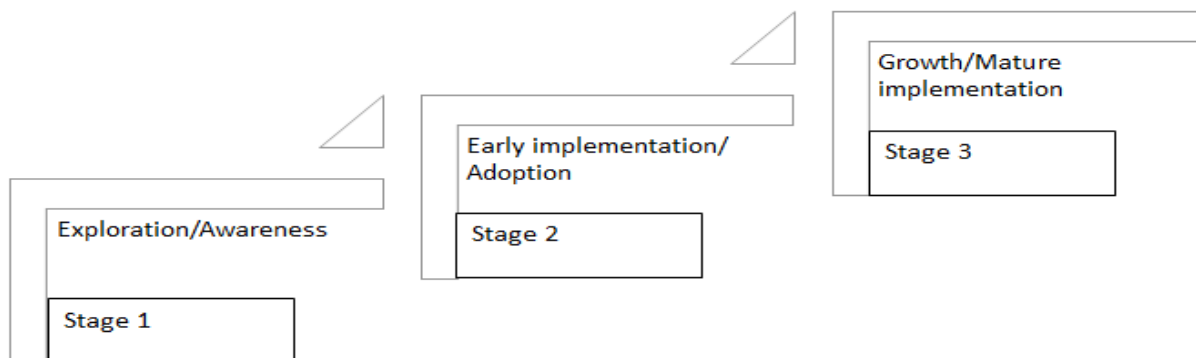


Figure 1 Blended learning implementation stages

Accordingly, Porter and Graham (2016); Porter et al. (2016) extended Rogers' (2003) diffusion of innovations theory and suggested that the stages of BL adoption in institution comprise of exploration/awareness, early implementation/adoption, and growth/mature implementation as seen in Figure 1, which depicts how institutions move their interest in BL to a mature institutionalization of BL. Each of the stage is discussed below;

- Stage 1: exploration/awareness is relates to institutions having no initiatives that promote BL adoption (Graham et al., 2013). In this stage the institutions are aware of the potential of BL but are faced with limited support to explore mediums that can be employed to diffuse BL approaches for teaching and learning (Porter et al., 2016).
- Stage 2: early implementation/adoption involves the institutions adoption of BL approaches and initiatives based on new policies and strategies to facilitate BL implementation (Graham et al., 2013; Porter et al., 2014).
- Stage 3: growth/mature implementation involve the existence of well-established BL support, structure, and strategies that are essential to facilitate BL implementation (Graham et al., 2013; Porter et al., 2016).

Although, Rogers' (2003) categorized the characteristics of innovation adoption into five categories, this study is more focused on stages of BL adoption similar to prior studies (Graham et al., 2013; Porter et al., 2014), and not the categories as previous examined by Porter and Graham (2016); Porter et al. (2016). This is because, this study aims to examine the variables that influence institutions administrators' readiness to diffuse BL in providing institutional administrators and others interested in BL adoption with information regarding how to facilitate BL adoption among their respective institutions. Furthermore, since Malaysia universities, colleges, and polytechnics are already adopting BL as discussed in Section 2.1, this study is mainly concerned with examining stage 3 which is the growth or mature BL implementation in Malaysia universities, colleges, and polytechnics.

2.3. Background of Institutional Blended Learning Adoption Framework

The framework for institutional adoption of BL in higher education was proposed by Graham et al. (2013) based on the growth/mature implementation stage as discussed in Section 2.2 grounded on institutional support, structure, and strategy as the main constructs. Thus, the proposed institutional BL adoption framework is shown in Figure 2 which comprises of three constructs as discussed below;

- Institutional strategy entails issues relating to complete BL design, such as BL definition, advocacy procedures, degree of implementation, BL purposes, and policies initiated to institutionalize BL (Porter et al., 2016). In summary the strategy comprises of purpose, advocacy, and definition (Graham et al., 2013).
- Institutional structure comprises issues associated with the pedagogical, technological, administrative governance, scheduling and evaluation procedures that facilitates BL diffusion

(Graham et al., 2013). In summary this construct comprises of infrastructure, scheduling, governance, evaluation, and professional development (Porter et al., 2016).

- Institutional support involves issues that address how institutions implements and maintains its BL approaches, including pedagogical support, technical support, and incentives (Porter et al., 2014). Thus, this construct includes financial incentives, pedagogical support, technical support, tenure promotion, and course load reduction (Graham et al., 2013).

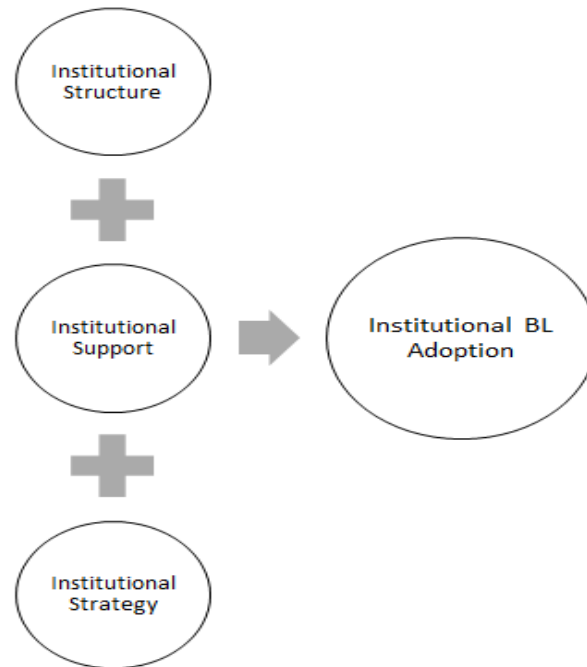


Figure 2 Institutional blended learning adoption framework

Therefore, this study employs both DoI theory and institutional BL adoption framework to investigate the variables that influences institutions administration readiness to diffuse BL initiatives. However, there are other variables such as the culture, norms, attitude which are beyond the scope of this study and are not covered by the integrated frameworks.

2.4.Related Works

This sub-section reviews prior studies that proposed approaches that examined BL adoption from the lens of institutions' administration as reviewed in Table 1. Respectively, Table 1 review prior studies that investigated BL adoption in institutional perspective, however very limited or no study has investigated administration/management readiness of diffusing BL approaches empirically based on statistical data. Moreover, only few studies have investigated institutions administration readiness in Malaysia higher education. Hence, this research would be one of the few studies that provide empirical evidence of universities, colleges, and polytechnics administration perception towards BL diffusion. Hence, there is need for a model to be developed in assessing institutions administration readiness and such model can be employed by e-learning administrator\manager and syllabus designer to institutionalize BL practice.

Table 1 Prior studies that examined institution administration adoption of BL

Authors & Contribution	Purpose/Aim	Employed Constructs	Methods	Context
Dakduk et al. (2018) examined the acceptance of BL in executive education.	Evaluated the factors that determine the acceptance of BL with managers in executive education.	Performance expectancy, effort expectancy, social influence, hedonic, motivation, habit, and behavioral intention.	The empirical analysis employed data from 307 samples from survey questionnaire by senior and middle-ranking managers.	Colombia
Dziuban, Graham, Moskal, Norberg, and Sicilia (2018) examined the effectiveness of BL coalesces to improve students' learning success.	Focused on improving outcomes, implications of ICT for BL in higher education.	Blended, online, and face to face approach.	Employed a classification and regression tree method.	USA
Porter and Graham (2016) explored the degree to which institutional structure, strategy, and support decisions supports or prevent BL adoption among higher education faculty.	Focused on assessing if faculty members' innovation adoption type impacts their decisions towards facilitating or inhibiting BL adoption.	Strategy, support, and structure.	Data was collected using survey instrument from 214 faculty members in a university at early implementation phase.	USA
Spring et al. (2016) carried out an exploratory research to determine the current state of BL worldwide.	Aimed to examine the current landscape of BL practice employed internationally and presented an overview of the current state of BL.	Student outcomes, flexibility, social justice, instructor experiences, access, and technology,	Data was collected using interviews from 12 BL practitioners and researchers.	USA
Porter et al. (2016) investigated the institutional barriers and drivers that influence BL adoption in higher education.	Aimed to determine the extent to which institutional measures impede or facilitates BL adoption among higher education faculty.	Strategy, support, and structure.	Data was collected using a surveyed from 214 academic staffs and interview data from 39 academic staffs at an institution in the early implementation stage of BL adoption.	USA
Porter et al. (2014) examined BL implementation and adoption issues in institutions of higher education.	Aimed to present research that guides institutions of higher education to strategically adopt and implement BL in their institutions.	Support, structure, and strategy.	Employed case study to collect data using semi-structured interviews from administrators and other BL implementers from eleven institutions.	USA
Wong, Tatnall, and Burgess (2014) proposed a framework for investigating BL effectiveness.	Aimed to assess the readiness, intensity of adoption and impact on BL offerings.	Organization for Economic Co-operation and Development model of readiness, intensity and impact.	515 usable survey responses in Victoria university.	Australia
Graham et al. (2013) proposed a framework for institutional implementation and adoption of BL in higher education.	Focused on addressing adoption issues faced by providing information required to strategically deploy BL.	Support, structure, and strategy.	Employed case study and collected data using semi-structured telephone interviews from six institutions.	USA
Carbonell et al. (2013) explored how to unleash the innovative capabilities of institutions faculty to create BL.	Determined the factors presented as crucial elements to be adopted for successful BL adoption.	The macro and micro contexts, the project leader and the project members.	Interview was employed to collect data from 1 student council, 13 faculty members, and 5 administrators.	The Netherlands
Garrison and Vaughan (2013) investigated institutional leadership and change associated with BL innovation in higher education.	Aimed to illustrate how institutional change related to BL approaches is predicated based on the commitment and collaborative leadership of institutions administration.	Blended learning definition, organizational change, and leadership.	Collected data based on two case studies.	Canada

Authors & Contribution	Purpose/Aim	Employed Constructs	Methods	Context
Moskal et al. (2013) proposed that the successful implementation of BL approach requires alignment of institutional, student, and faculty goals.	Determined that robust and reliable infrastructure, and continuous evaluation is required for successful BL.	Institutional goals and objectives, alignment, organizational capacity, definitions, faculty and course development support, infrastructure, data collection and assessment, proactive policy development and funding.	Utilized case study data from 9 universities.	USA
Taylor and Newton (2013) examined institutional teaching and learning process that would support diverse students' unrestricted access to learning.	Aimed to specify the barriers and facilitators to systemic adoption of BL.	Subject design processes, students' experiences, staff experiences, educational technologies, and institutional factors.	Employed case study of an Australian regional university.	Australia
Basir et al. (2010) developed an institutional strategy for improved blended e-learning.	Focused on achieving sustainable institutional approach for e-learning based on technology acceptance and continuance.	Ethical issues (legal and intellectual property rights), institutional strategy, institutional policy, infrastructure, and assessment.	Only secondary data from the literature was utilized.	Malaysia
Mercado (2008) designed a readiness assessment approach for e-learning based environment.	Aimed to present a readiness instrument based on identified factors that can be employed by institutions to assess their current e-learning state.	Institutional readiness (administrative support (commitment, policies, instructional)), and resource support (financial, human, technical).	Only secondary data from the literature was utilized.	Philippines
Machado (2007) designed an e-readiness model for institutions of higher education.	Aimed to defined and verify the main factors required for successful implementation of an e-readiness e-learning evaluation approach for institutions.	Policy and strategy, infrastructure, and support.	Qualitative data was collected based on focus group interview from 5 participants.	Belgium

3. Model and Hypotheses Development

This Section aims to provide answer to the first research question; which variables and associated factors influence administrators' readiness to diffuse BL? Hence, the variables are identified grounded by the mature implementation stage of diffusion of innovation theory and institutional BL adoption framework discussed in Section 2.2 and 2.3. Therefore, the identified variables and related factors includes;

3.1. Institutional Structure

The institutional structure involves administration initiating policies that promotes the recognition and accreditation of BL approaches in the institution, thus helping to translate BL policies into actual implementation (Wong et al., 2014). The role of institutions administration is not only to provide the needed BL infrastructure but also to foster sustainability of BL initiatives

being adopted in the institution for academic staffs and students (Wong et al., 2014; Yeop, Wong, and Noh, 2016). Notwithstanding, findings from Yeop et al. (2016) mentioned that although institution administration is the main component which helps to govern academic staffs and students, it is the least researched component as compared to studies conducted to explore students and lecturer's readiness to adopt BL. Thus, the institutional structure factors relates to the vision/mission, advocacy, and definition/plan of the institution in regards to their readiness to adopt BL (Graham et al., 2013; Porter et al., 2014). In terms of the vision and mission, institutions adopting BL should identify the goals they intend to achieve, which should be based on enhancing pedagogy, increased BL resources flexibility and access, and lastly improve resource use and cost effectiveness (Porter et al., 2014).

Furthermore, vision and mission relate to the idea that management has agreed to implement BL based on the institution values (Tahir, Said, Ali, Samah, Daud, and Mohtar, 2013). Also, faculties need to ascertain how their respective departmental goals and educational programs correspond with the institution's vision and mission if BL initiative is to succeed (Moskal et al., 2013; Jääskelä, Häkkinen, and Rasku-Puttonen, 2017). Thus, BL is effective when the administration is committed to improve teaching and learning quality in a cost-effective approach, then technology can be viewed as a tool to be employed in achieving strategic goal of the institution (Tahir et al., 2013). Although, findings from Chong et al. (2010) revealed that resistance to institutional change was mentioned as one of the main factors that inhabits institutions' ability to restructure BL policies. In terms of advocacy successful BL diffusion requires advocacy among faculties, administrators, and staffs. Administration advocates support to develop a shared vision for BL adoption, extends communication, and allocates needed resources and funding.

Thus, administration advocacy provides enthusiasm and cooperation that facilitate BL implementation (Porter et al., 2014). For definition, drafting an institutional BL plan can ease a number of essential objectives, which entails distinguishing BL approaches from other educational methods for providing students with reliable and clear prospects regarding BL, and also developing suitable support strategies (Graham et al., 2013). Correspondingly, Porter et al. (2014) affirmed that while administration formulating BL definition does not essentially require all lecturers to follow identical pedagogical structure, a defined plan can simplify a level of consistency. Likewise, Spring et al. (2016) argued that institution should align its BL definition with its core objectives while remaining consistent with its institutional vision and mission. Based on the proceeding discussion we propose that;

H1: Institutional structure has a significant influence on administration readiness to diffuse BL.

3.2.Resource Support

In the context of this study resource support may be defined as enhancing actions or elements provided for students and academic staffs by administration towards BL adoption. This variable measures the extent to which enabling environment or conditions exist to promote BL adoption (Ho, 2017). Furthermore, findings from Ghazal et al. (2018) indicated that administration

support positively determines lecturers' perception towards the ease of use and usefulness of BL approaches. Thus, if there are no supports provided to learners in BL environment, they are likely to become discouraged with using BL approaches for learning (Ghazal et al., 2018). Respectively, support encompasses issues relating to the way institutions facilitate implementation and maintenance of BL environment (Yeop et al., 2016). The resources support factors includes technical support, pedagogical support, financial support, and tenure/promotion (Porter et al., 2016). Technical support helps to maintain IT facilities and equipment utilized by students and lecturers for BL activities (Cacciamani et al., 2018). Thus, institutions are required to provide dedicated support services to assist students and lecturers throughout the use and development of courses in order to ensure effective BL adoption (Poon, 2014).

Results from Ahmed (2010) confirmed that efficient technical and pedagogy support significantly results to higher acceptance of blended e-learning adoption by students and lecturers. Likewise, results from Porter et al. (2014); Ghazal et al. (2018) indicated that provision of pedagogy support to lecturers on how to manage blended course content positively influenced their perception towards using BL for teaching. In addition, students and academics need to be competent in technology usage in order to adopt BL approaches. As such, it is important to provide technical skills development to students and lecturer (Poon, 2014). The provision of financial support is also necessary to initiate and promote BL initiatives (Garrison and Kanuka, 2004; Porter et al., 2016). Financial incentives can be provided to motivate academics in adopting BL by providing workload compensation, remunerations for BL implementation, or financing technological infrastructures (Graham et al., 2013; Moskal et al., 2013). Thus, policies regarding reward, tenure, and promotion can be provided to lecturers by institutions to demonstrate their support and endorsement of BL implementation (Basir et al., 2010; Chong et al., 2010; Porter et al., 2014). Accordingly, findings from Graham et al. (2013) suggested that providing incentives to support BL adoption by academics positively increased BL implementation. Based on the aforementioned discussion we propose that;

H2: Resource support positively influences administration readiness to diffuse BL.

3.3. Management Strategies

Management strategies outline the overall initiatives to be employed for administration to translate BL policy into actual BL implementation within faculties (Chong et al., 2010). Thus, administration needs to clearly specify the roles of BL and provide proper direction for faculties in planning and adopting BL initiatives (Moskal et al., 2013). Moreover, there is need to stipulate the available method on how BL approaches can be diffused to improve teaching, for example by providing guidance on asynchronous and synchronous approaches of BL pedagogy to ensure that students' academic requirements are achieved (Basir et al., 2010). According to Graham et al. (2013); Porter et al. (2014) management strategies factors comprises of evaluation, professional development, governance. Thus, current BL approach needs to be evaluated to assess teaching and learning performance in identifying weaknesses to be improved. The evaluation can be

periodically employed and follow up actions for improvement should be deployed accordingly and promptly (Garrison and Kanuka 2004; Basir et al., 2010). Thus, evaluation involves the perceptions of students regarding lecturers teaching where feedback is collected and presented to stakeholders (Graham et al., 2013) to be used for future improvement (Chong et al., 2010; Moskal et al., 2013).

Similarly, professional development or as referred to as training is a process by which lecturers and students are equipped with skills required to accomplish an activity or a task in this case implementing BL approaches (Lança and Bjerre, 2018). Professional development can be carried out in the form of workshops, seminars, online tutorials, and short courses (Bowyer, 2017). Results from Poon (2014); Ghazal et al. (2018) confirmed that training provided to students was found to be an important factor that promotes the adoption of BL. Thus, Ghazal et al. (2018) highlighted that lack of training influence students' learning experience and success of BL approach. Furthermore, when lecturers are provided with the necessary training and skill, they perceive BL as easy to use and useful (Chong et al., 2010; Tahir et al., 2013). Thus, BL is most successful when there is administrative support through the provision of professional development (Kuar, 2013). Additionally, researchers such as Ghazal et al. (2018) argued that BL is effective when management governance is aligned to improve the quality of lecturers teaching and student learning experience in a cost-effective manner. Hence, BL governance should provide clear policies, more organized distribution of course schedule plan and implementation responsibilities for the semester (Moskal et al., 2013). Accordingly, we hypothesize that;

H3: Management strategies have a significant influence on administration readiness to diffuse BL.

3.4. Technology Infrastructures

The first and most primary component in BL adoption is the deployment of necessary infrastructures which includes office space, hardware, software, and internet access (Ahmed, 2010). In BL environment technology infrastructure factors consists of network infrastructure such as wireless network and high-speed network, software infrastructure that improve access and flexibility to online and F2F learning, and lastly physical hardware equipment that facilitate BL (Basir et al., 2010). Moreover, technology infrastructure refers to technical resources that enhance teaching and learning activities in BL environment (Garrison and Kanuka, 2004). Accordingly, findings from prior studies (Basir et al., 2010; Al-Busaidi, 2012; Springs et al., 2016; Ghazal et al., 2018) reported inadequate technological infrastructure as one of the inhibitors of BL implementation. This setback may be attributed by administration concerns regarding the cost of deploying and maintaining IT infrastructure (Graham et al., 2013). Accordingly, deploying the required technological infrastructure is essential for effective BL implementation, thus institutions seeking to diffuse BL must provide the fundamental technological infrastructure needed for effective BL implementation (Porter et al., 2014). Respectively, administration should plan with Information Technology (IT) vendors to ensure they deliver reliable IT infrastructures that always meet the learning and teaching needs of student and lecturers, and that they have a scalable plan

to improve the infrastructures as demand and usage increase (Moskal et al., 2013). Based on the literature, the following hypothesis is proposed that;

H4: Available technology infrastructures have a positive influence on administration readiness to diffuse BL.

3.5. Ethical Considerations

With increase of online learning resources and materials it is easy to disseminate course materials via the internet, legal and ownership of Intellectual Property (IP) has become an important issue in BL implementation (Fleck, 2012; Roszak, Kołodziejczak, Kowalewski, and Ren-Kurc, 2014). Thus, policies need to be institutionalized up front regarding accessibility and ownership of educational materials (Graham et al., 2013; Moskal et al., 2013). Therefore, BL policies initiated in the institution should unambiguously state the regulation and rules pertaining to issues such as ownership of course materials, editing and rights privileges, use fees, royalties, distribution, circulation of course materials designed by lecturers (Basir et al., 2010). Besides, institutions adopting BL should determine who approves the development of BL courses and who owns intellectual property rights to materials created for academics, including matters of accessibility, and commercial sales of course materials developed by lecturers (Basir et al., 2010; Porter et al., 2014). Therefore, this study suggests the following hypothesis;

H5: Ethical issues to be considered in the institution positively influences administration readiness to diffuse BL.

3.6. Readiness to Diffuse Blended Learning

In this study readiness is a measure of the degree to which the institution administrations may be willing, ready, or prepared to acquire benefits which arise from the deployment of ICT as BL to support teaching and learning effectiveness (Wong et al., 2014). Institution's readiness to adopt BL is reflected in the decision of the administration to incorporate BL approaches into the current institution curriculum (Machado, 2007; Wong et al., 2014). Therefore, the institution administration readiness assesses whether processes are put in place to facilitate both students and lecturers in adopting BL initiatives (Mercado, 2008). The readiness construct provide a goal for the institution as it assess its capability to diffuse BL in improving teaching and learning effectiveness. The readiness also measures the current BL status in relation to where the institution envisions BL to be in future. These important information supports institution administration to develop policies as well as roadmap for improving BL implementation to enhance teaching and learning (Mercado, 2008).

Therefore, based on the identified variables and associated factors that influence institutions administrators' readiness to diffuse BL grounded on DoI theory and institutional BL adoption framework, the model is developed as seen in Figure 3 to assess institutions administrators' readiness to diffuse BL in providing answers to the second research questions.

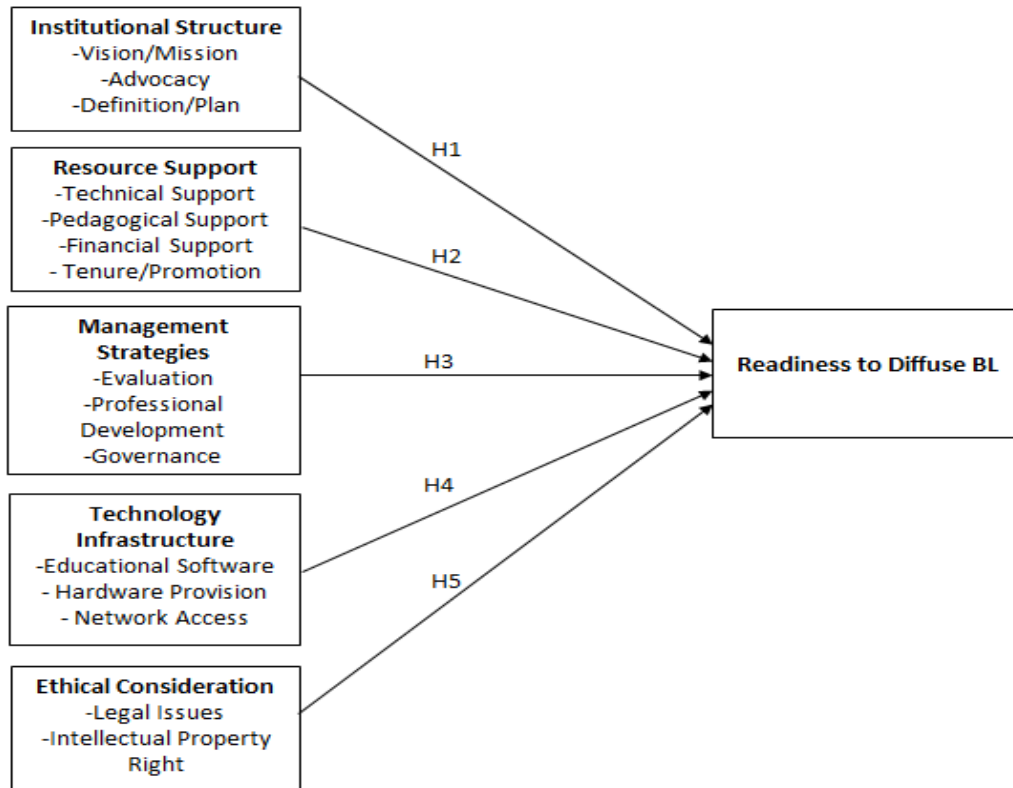


Figure 3 Developed model

Figure 3 depicts the developed model to investigate the variables and related factors that influences institutions administration readiness to diffuse BL initiatives.

4. Research Methodology

4.1. Research Context

A quantitative research method was employed in this study to examine the effects of the variables (see Figure 3) that influence institutions administrators' readiness to diffuse BL. This study adopted confirmatory research approach which involves proposing hypotheses grounded by prior studies and later testing the hypotheses using statistical method. Thus, in confirmatory approach hypotheses are generally derived from a theory or the outcomes of previous studies. Hence, confirmatory research approach was adopted as it provides results that are easily analyzed, summarized, and tabulated. It also offers freedom and flexibility for participants (Ghazal et al., 2018). Data was collected from institutions administrators/managers in Malaysia universities, colleges, and polytechnics (see Table 2), in their mature implementation stage of BL adoption (Graham et al, 2013). The institutions adopt both F2F weekly classes and e-learning system such as Moodle, MOOC, Learning Management System (LMS), etc. in teaching and learning process with a decrease in physical class time. Moreover, each administrators/managers involves in the data collection process maintains his/her institutions' e-learning system.

4.2.Data Collection

The survey instrument was developed in English language and Bahasa Malayu to ensure that the questionnaires were suitable for all participants. To establish evidence of face and content validity of the questionnaire, we asked experts (7 IT and 3 education domain) to review the instrument and determine whether it measures our intended concepts. We also involved one stakeholder in key positions at a university for further confirmation of the questionnaire to assure that the instrument was suitable for the context. Next, pilot study was carried out and data was collected from four e-learning administrators to assess if the participants understand the questions and to test the reliability of questionnaires instruments. Results from the pilot revealed that the Cronbach's alpha was higher than 0.7 which reflects an acceptable level of reliability. Then, links to the survey was sent to purposive selected e-learning administrators/managers in Malaysia institutions, where the target sample for this research included e-learning staffs and administrators that maintains online learning platforms. The e-learning administrators were selected due to their experience and familiarity with BL environment in providing answers based on their perceptions and readiness toward BL.

Table 2 Institutions involved in the survey

Institutions category	Respondents
Public University	23
Private University	31
Institute of Teachers Education	2
University College/Institute	8
Polytechnics	159
Total	223

Accordingly, implicit consent was provided to the respondents who completed the survey. The aim and purpose of the study and respondent's rights not to partake in the survey was clearly specified. Hence, participation in the survey was voluntary. Then, invitations to participate in the main survey, including link to the questionnaire, was distributed to e-learning administrators via emailed and the links was also distributed to various e-learning centers of selected universities, colleges, and polytechnics in Malaysia from January 2019 to April 2019. The data collection involves a survey of e-learning administrators in Malaysia institutions as seen in Table 2. On average, each respondent took not more than 7 minutes to answer all questions. The questionnaire comprises of two sections. The first section included the demographic question (gender, age, job title, years of experience in e-learning, nationality, academic qualification, institution name, type, level, e-learning center name, and year of establishment) measured using continuous or categorical measurement. The second section is based on the developed model (see Figure 3), where the questionnaire rates the perception and readiness of the administrators in regards to BL diffusion in their institutions measured based on a five point Likert-type scale anchored from 1 to 5, where (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) similar to Al-Busaidi (2012); Ghazal et al. (2018). The questionnaire was developed based on existing instruments from prior studies (see Table 3).

Table 3 Questionnaire items

Variables	Factors	Items	Sources
Institutional Structure	Vision/Mission	IS1-BL initiative is aligned with the institution's mission. IS2-Promotion of BL aligned with my own view.	(Porter et al., 2016; Porter and Graham, 2016; Anthony et al., 2019).
	Advocacy	IS3-Faculty management promotes BL. IS4-Faculty member supports BL. IS5-Top management advocates BL.	
	Definition/Plan	IS6-There are clear policies for adoption and promotion of BL in my institution. IS7-My institution strategically engages 3 groups of staff which are academic staffs, IT personnel and administrators on BL initiatives.	
Resource Support	Technical Support	RS1-Technological support provides 24 hours or when needed. RS2-Technological support is provided by specific unit in my institution. RS3-Technological support is provided through online system	(Machado, 2007; Poon, 2014; Porter et al., 2016).
	Pedagogical Support	RS4-Pedagogical support is provided for BL. RS5-Professional development opportunities are provided to assist academic staffs in improving their online teaching. RS6-Networking with other online practitioners is supported to discuss pedagogical issues.	
	Financial Support	RS7-Incentives are provided for academic staff to support BL. RS8-Recognitions are provided for academic staff to support BL. RS9-Academic Staff who active in BL will receive research grant to support his/her teaching and learning.	
	Tenure/Promotion	RS10-BL is part of criteria for academic staff's tenure/promotions. RS11-Experienced academic staff is been appointed to oversee the implementation of BL.	
Management Strategies	Evaluation	MS1-The effectiveness of BL is evaluated by lecturer. MS2-The effectiveness of BL is evaluated by students. MS3-The evaluation report is shared to stakeholders.	(Porter and Graham, 2016; Ghazal et al., 2018).
	Professional Development	MS4-Face to face session for professional development/training on BL is provided and promoted. MS5-Online session for professional development/training on BL is provided and promoted. MS6-Professional development/training on pedagogical knowledge is provided and promoted. MS7-Professional development/training on technological knowledge is provided and promoted.	
	Governance	MS8-The implementation of BL is monitored at faculty level. MS9-The implementation of BL is monitored at institutional level. MS10-There is an annual plan for the implementation of BL.	
Technology Infrastructure	Educational Software	T11-Applications for digital learning content development are provided T12-Collaborative learning software and tools are provided.	(Graham, 2016; Dakduk et al., 2018).
	Hardware Provision	T13-Digital devices (computer/tablet etc.) are provided campus wide. T14-Charging stations are provided campus wide.	
	Network Access	T15-Internet connectivity is provided campus wide.	
Ethical Consideration	Legal Issues	EC1-There is a clear policy on ownership of BL materials, rights and editing privileges.	(Basir et al., 2010; Fleck, 2012).
	Intellectual Property Right	EC2-There is a clear policy on distribution of materials developed by lecturers.	
Readiness to Diffuse BL	Readiness to Improve BL Effectiveness	RD1- My institution initiates policies regarding blending of F2F and online courses. RD2- My institution provides both F2F and online applications to improve student learning RD3- My institution provides course resources to aid learning performance.	(Sun and Qiu, 2017; Dakduk et al., 2018).

Accordingly, Table 3 depicts the variables, items and sources. In principle, each latent variable is expected to have at least 3 items to capture the actual phenomenon or measure the variable in providing results that can be statistically inferred to get a good fit of the model (Teo, 2019). Thus, in conducting the test in Partial Least Squares (PLS)-Structural Equation Modeling (SEM) as recommended by Jnr (2019), we used 5000 bootstrapping technique to overcome this limitation in deploying the statically test. The questionnaire comprised of 38 items, and at the end of the data collection a total of 223 samples was collected, but 56 samples were excluded due to incomplete data which resulted to a final 167 usable samples. Table 4 depicts the demographic characteristics of the survey respondents and their respective institutions.

Table 4 Characteristic of administrator questionnaire participants

Profile	Options	Percentage
Gender	Male	37.1%
	Female	62.9%
Age	1960-1969	4.8%
	1970-1979	22.2%
	1980-1989	29.4%
	1990-1999	26.4%
	2000	17.4%
Nationality	Malaysian	99.4%
	International	0.6%
Job Title	E-learning director or equivalent	11.4%
	E-learning manager or equivalent	13.8%
	E-learning coordinator or equivalent	33.5%
	Others	41.3%
Experience in E-learning	1-5	69.6%
	6-10	26.4%
	11-15	2.4%
	16-20	1.8%
Academic Qualification	Doctorate	12.6%
	Master's Degree	34.1%
	Bachelor's Degree	12.6%
	Advanced Diploma	2.4%
	Diploma or Equivalent.	37.1%
Institution Type	Professional Qualification	1.2%
	Public	87.4%
Institution Category	Private	12.6%
	University	22.4%
	University College	1.8%
	College	3.0%
	Polytechnic	72.7%
Year of Establishment	1999-2004	3.6%
	2005-2009	4.8%
	2010-2013	27.6%
	2014-2017	46.2%
	2018	18.0%

5. Data Analysis and Results

5.1.Data Analysis

This study employed Statistical Package for Social Science (SPSS) version 23 and SEM based on PLS for data analysis. SEM approach was selected because it can be utilized to analyze

all hypotheses in a single analysis (Lin and Wang, 2012). Likewise, SEM was employed in this research due to its ability to analyze the relationships between the variables and approximate random errors in the observed constructs directly in providing precise measurements of the questionnaire items and variables (Teo, 2019). Furthermore, PLS is a latent SEM technique that uses a component based method for estimation (Anthony Jr, 2019). Thus, PLS-SEM provides two analyses which include assessment of measurement model (evaluation of reliability and validity of constructs) and assessment of structural model (validates model variables) (Hair et al., 2016). SmartPLS version 3.0 was deployed to assess the measurement and the structural model and SPSS version 23 was employed to carry out descriptive analysis.

5.2. Assessment of Measurement Model

This is the first step involved in assessing the developed model (see Figure 3). This step assesses how well the observed questionnaire items measure the unobserved variables as presented in Table 3 (Teo, 2019). The measurement model was evaluated based on descriptive analysis, item loadings, reliability measures, convergent validity, and discriminant validity.

5.2.1. Descriptive, Convergent Validity, and Reliability

SPSS was employed to check the descriptive statistics for all constructs. Results from Table 5 indicate that the mean values are higher than 2.5 based on a 5 point scale. Moreover, the Standard Deviation (SD) are lower than 1 and close to 0 indicating a narrow spread between the mean indicating that the responses from the respondents are close, and not widely dispersed (Anthony, Abdul Majid, and Romli, 2018b). The data was also screened to confirm normality by checking the Skewness and Kurtosis values. The values of the Skewness and Kurtosis for the items were between the recommended cutoffs of 3.0 for Skewness and 8.0 for Kurtosis as recommended by Teo (2019).

Table 5 Descriptive statistics

Variables	Factors	Mean	Std. Deviation	Skewness	Kurtosis
Institutional Structure	Vision/Mission	4.13	0.723	-1.487	4.511
	Advocacy	4.14	0.696	-1.479	4.769
	Definition/Plan	4.06	0.743	-0.990	1.740
Resource Support	Technical Support	3.92	0.742	-0.677	1.056
	Pedagogical Support	3.92	0.742	-0.677	1.056
	Financial Support	3.88	0.766	-0.520	-0.032
	Tenure/Promotion	3.99	0.763	-0.898	1.874
Management Strategies	Evaluation	3.86	0.721	-0.520	0.498
	Professional Development	4.00	0.729	-1.230	3.433
	Governance	4.09	0.650	-0.845	2.758
Technology Infrastructure	Educational Software	4.01	0.752	-1.005	2.288
	Hardware Provision	3.75	0.865	-.754	0.743
	Network Access	3.96	0.925	-1.068	1.221
Ethical Consideration	Legal Issues	3.87	0.866	-0.794	0.680
	Intellectual Property Right	3.84	0.875	-0.637	0.340
Readiness to Diffuse BL	Readiness to Improve BL Effectiveness	3.94	0.618	-1.074	3.417

Furthermore, the reliability and validity were assessed, where the reliability refers to the degree to which the variables give consistent results and are free from errors. Likewise, validity refers to the extent to which a variable differs from other variables in the same model in measuring what it supposed to measure (Yeou, 2016).

Table 6 Loading and reliability

Variables	Factors	Items	Loadings	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Institutional Structure	Vision/Mission	IS1	0.883	0.933	0.942	0.700
		IS2	0.861			
	Advocacy	IS3	0.845			
		IS4	0.860			
		IS5	0.886			
	Definition/Plan	IS6	0.749			
		IS7	0.763			
Resource Support	Technical Support	RS1	0.799	0.913	0.919	0.510
		RS2	0.733			
		RS3	0.711			
	Pedagogical Support	RS4	0.719			
		RS5	0.555			
		RS6	0.651			
	Financial Support	RS7	0.708			
		RS8	0.718			
		RS9	0.781			
	Tenure/Promotion	RS10	0.721			
		RS11	0.729			
Management Strategies	Evaluation	MS1	0.796	0.929	0.930	0.573
		MS2	0.759			
		MS3	0.642			
	Professional Development	MS4	0.839			
		MS5	0.766			
		MS6	0.860			
		MS7	0.843			
	Governance	MS8	0.723			
		MS9	0.595			
		MS10	0.700			
Technology Infrastructure	Educational Software	T11	0.868	0.872	0.905	0.658
		T12	0.741			
	Hardware Provision	T13	0.845			
		T14	0.764			
	Network Access	T15	0.829			
Ethical Consideration	Legal Issues	EC1	0.995	0.872	0.912	0.840
	Intellectual Property Right	EC2	0.830			
Readiness to Diffuse BL	Readiness to Improve BL Effectiveness	RD1	0.857	0.854	0.911	0.773
		RD2	0.908			
		RD3	0.872			

In assessing the measurement model all results from Table 6 depict that items loaded exceed the minimum threshold of 0.4 as recommended by Lin and Wang (2012) and 0.5 as suggested by Al-Busaidi (2012). In addition, results in Table 6 show the reliability measure based

on the Composite Reliability (CR) and Cronbach’s alpha score which should be greater than 0.70 for CR and Cronbach’s alpha (Hair et al., 2016; Anthony, Abdul Majid, and Romli, 2018a). Besides, convergent validity, which specifies that a set of items corresponds to one and the same underlying variable, was assessed as seen in Table 6 based on the values of the Average Variance Extracted (AVE) which should be greater than 0.50 denoting that a variable is able to explain more than 50% variance of its items (Fornell and Larcker, 1981; Hair et al., 2016).

5.2.2. Discriminant Validity

Discriminant validity relates to the level of difference between the sets of variables and their own items\indicators. In this regard, Hair et al. (2016) mentioned that the correlations between items in two variables should not be higher than the square root of the mean variance shared by a single variable’s items. To assess for discriminant validity, the Fornell and Larcker (1981) test was employed, where this test checks if the square root of AVE of each variable exceeds the correlation shared between the variables and other variables in the model. Moreover, the AVE value should be greater than 0.50 for all variables measuring 50% variance (Anthony Jr, Abdul Majid, and Romli, 2018).

Table 7 Discriminate validity

Variables	Ethical Consideration	Institutional Structure	Management Strategies	Readiness to Diffuse BL	Resource Support	Technology Infrastructure
Ethical Consideration	0.916					
Institutional Structure	0.436	0.837				
Management Strategies	0.726	0.545	0.757			
Readiness to Diffuse BL	-0.002	0.105	0.061	0.879		
Resource Support	0.657	0.541	0.724	0.089	0.714	
Technology Infrastructure	0.745	0.570	0.755	0.073	0.627	0.811

Results from Table 7 indicate that all variables acceptably higher than 0.5 and the square root of the AVE (on the diagonal) are larger than the cross-correlations with other variables.

5.3. Assessment of Structural Model

The assessment of the structural model is carried out to test the relationships in the model in confirming the model hypotheses as seen in Figure 3. The structural model assessment is measured by examining the path coefficients value (β) which evaluates the association between constructs based on their degree of corresponding significant levels (p -value) using PLS path modeling technique. Furthermore, the coefficient of determination known as R^2 value which is an assessment of the model’s predictive power is calculated based on the squared correlation between the variables in the model. The literature (Baragash and Al-Samarraie, 2018) recommended that R^2 values of 0.67, 0.33, and 0.19 were regarded as excellent, average, and low, respectively. Likewise, Salloum, Al-Emran, Shaalan, and Tarhini (2019) suggested that the R^2 value should be greater than 0.10 to be acceptable. Lastly, bootstrapping techniques in PLS based on 5000 samples

was employed to measure the level of significance of the paths (*t-value*) which should be higher than 1.96 for two-tail test as previously employed by Anthony, Abdul Majid, and Romli (2018b). Thus, results of path coefficient, standard error, R^2 , β , t , and p -value shown in Table 8 and Figure 4 is used to validate the developed model hypotheses (H1-H5).

Table 8 Results of hypotheses (H1-H5)

Hypotheses	Path Description	Standard Error (SE)	Path Coefficient Beta (β)	R^2	t -value	Significance level (p -value)	Results
H1	Institutional Structure -> Readiness to Diffuse BL	0.048	0.712	0.507	13.877	0.000	Supported
H2	Resource Support -> Readiness to Diffuse BL	0.030	0.894	0.799	27.273	0.000	Supported
H3	Management Strategies -> Readiness to Diffuse BL	0.042	0.951	0.904	41.924	0.000	Supported
H4	Technology Infrastructure -> Readiness to Diffuse BL	0.023	0.930	0.865	34.677	0.000	Supported
H5	Ethical Consideration -> Readiness to Diffuse BL	0.027	0.875	0.765	24.657	0.000	Supported

Decision: Hypothesis is supported if t -value ≥ 1.96 and p -value ≤ 0.05

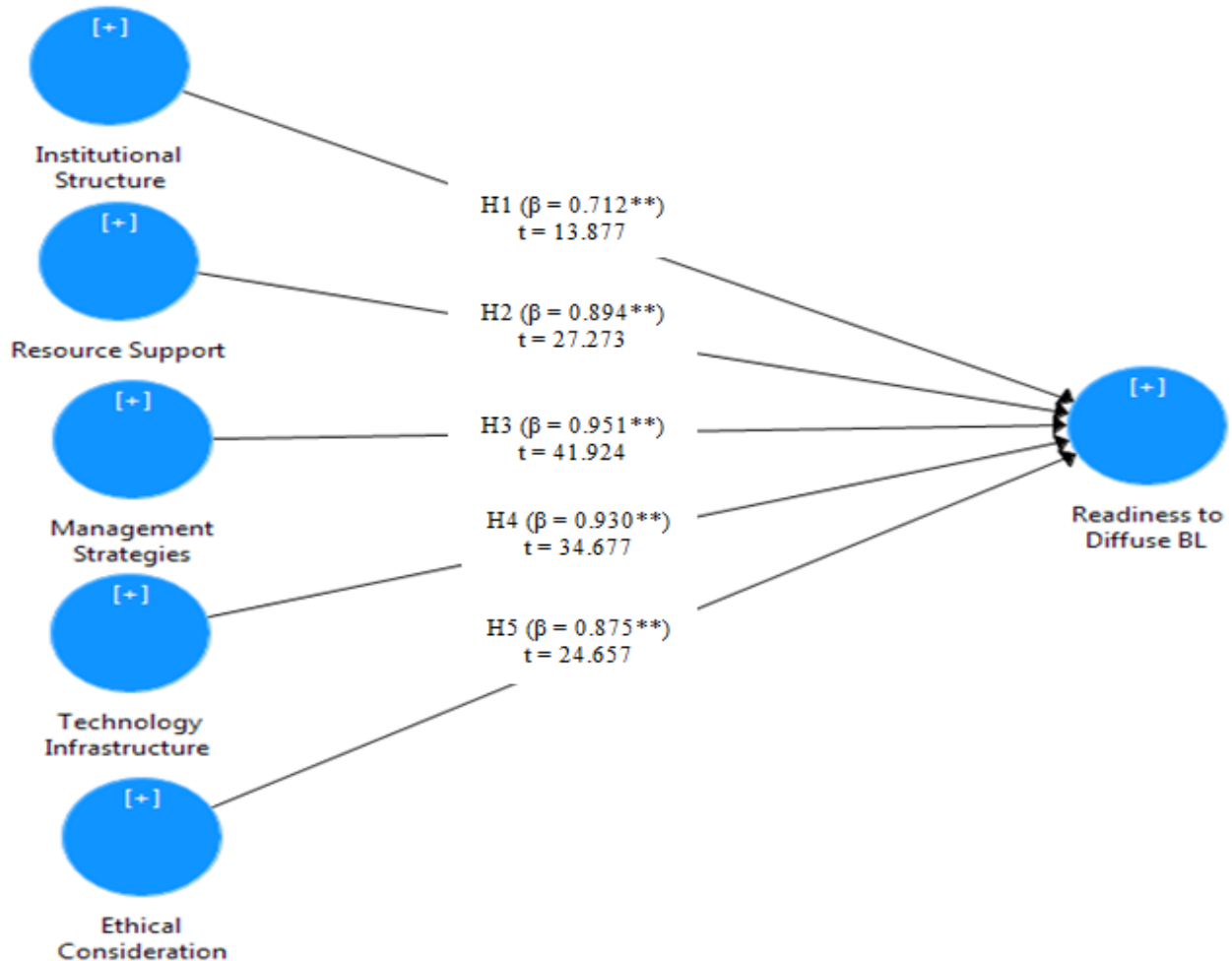


Figure 4 Results of the structural model. Note: $**p < 0.05$

Results from Table 8 and Figure 4 show the significance testing of the model hypotheses presented in Figure 3. H1 states that institutional structure has a significant influence on administration readiness to diffuse BL. Results from Table 8 show that H1 path coefficient is 0.712 ($t=13.877$, $p=0.000$), therefore supporting H1 since t -value is greater than 1.96 benchmark and path coefficient is higher than “0” (Anthony Jr, 2019). Similarly, H2 states that resource support positively influences administration readiness to diffuse BL. Results from Table 8 further suggest that H2 path coefficient is 0.894 ($t=27.273$, $p=0.000$), therefore supporting H2. Next, H3 states that management strategies have a significant influence on administration readiness to diffuse BL. Accordingly, results from Table 8 disclose that the hypothesis is significant where path coefficient is 0.951 ($t=41.924$, $p=0.000$). Similarly, results from Table 8 reveal that available technology infrastructures have a positive influence on administration readiness to diffuse BL (H4) with path coefficient of 0.930 ($t=34.677$, $p=0.000$). Likewise, the results confirm H5 which suggest that ethical issues to be considered in the institution positively influences administration readiness to diffuse BL with path coefficient of 0.875 ($t=24.657$, $p=0.000$).

In addition, results from Table 7 show that the R^2 values ranges from H1= 0.507, H2= 0.799, H3= 0.904, H4= 0.865, H5= 0.765. The result suggests that all R^2 values are higher than 0.1 as recommended by Salloum et al. (2019) and ranges from H3 with 0.904 suggesting that management strategies predicts 90.4% of administration readiness to diffuse BL. Next, is H4 with 0.865, indicating that the technological infrastructure explains 86.5% variance of administration readiness to diffuse BL. Followed by H2 with 0.799, thus explaining 79.9% variance of administration readiness to diffuse BL and then its H5 with 0.765 predicting 76.65% variance of administration readiness to diffuse BL and lastly its H1 with 0.507 which explains on 50.7% variance of administration readiness to diffuse BL. The results indicate that all hypotheses have an average to excellent R^2 values (Baragash and Al-Samarraie, 2018). The results empirically confirm that H3 has the strongest effect, thus evaluation, professional development, and governance policies are more important to be adopted if administration wants to diffuse BL in their respective institutions.

5.4.Importance Performance Map Analysis (IPMA)

Accordingly, academicians such as Chin (1998); Anthony et al. (2018b) mentioned that researchers should not only confirm if there is a significant relationship among the variables or not, but also check the size of effect between the variables. Thus, in addition to confirming hypotheses there is need to check the model’s effect size which measures the percentage of the importance and impact levels of the identified variables influence on the readiness of administration to adopt BL approaches R^2 values. Where, the effect size assesses the strength of correlation among the variables. This helps in providing answer to the last research question what are the importance and impact levels of the identified variables? thus confirming the complete impact of the study. Hence, Importance-Performance Map Analysis (IPMA) was deployed analogous to prior BL study (Bervell and Umar, 2018) as seen in Figure 5 to test for total effect for importance (values inside the circles) and impact levels (values on the line) of the variables.

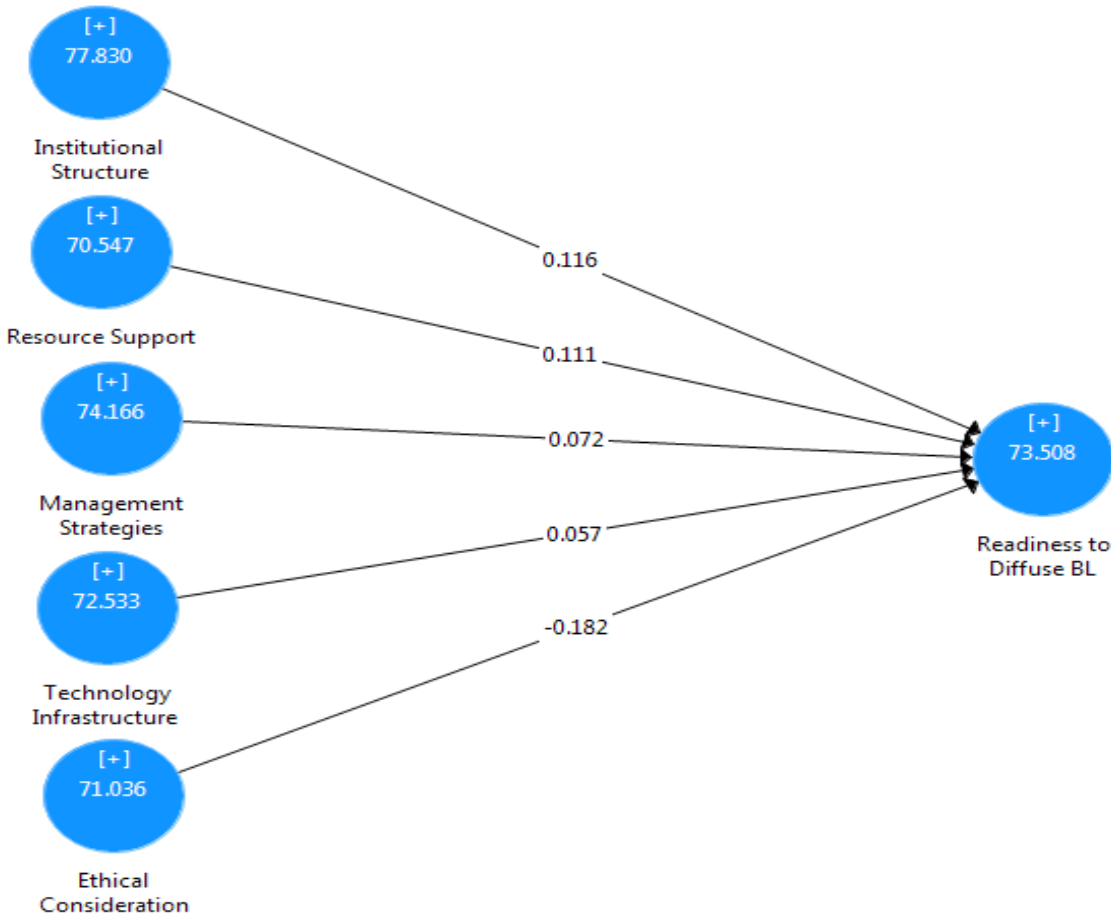


Figure 5 Results for importance-performance map analysis

Results from IPMA test in SmartPLS3 as depicted in Figure 5 reveal the test of total effect of the developed model (see Figure 3) suggesting that institutional structure is the most influencing variable that influences institutions administrators' readiness to diffuse BL with a total effect of 0.116. This result confirms findings from prior studies (Graham et al., 2013; Porter et al., 2014) which stated that institutional structure, which comprises of purpose, definition, and advocacy towards BL, is one of the main factors that influence institutional management to adopt and implement BL. Similarly, results from Figure 5 suggest that institutional structure is the most performing variable with a value of 77.830, signifying that the current institutional BL structure employed in universities, colleges, and polytechnics is the most important variable that determines the institutionalization of BL.

5.5. Discussion

BL provides an efficient approach for lecturers to teach and students to learn, thus offering academic institutions with a medium to store, share, and manage academic knowledge and resources. Although, BL is deployed by academic staffs and students in higher education, its survival in the long run depends on the commitment and support of institutional administration.

Accordingly, this study develops a model to examine variables and associated factors that influence institutions administration readiness to diffuse BL initiatives. Data was collected using survey questionnaire from e-learning administrators/managers in Malaysia universities, colleges, and polytechnics. PLS-SEM was employed to analyze the collected data in validating the developed model hypotheses. The result confirms H1, suggesting that there is a significant relationship between institutional structure and administration readiness to diffuse BL. This result is consistent with work of prior studies (Moskal et al., 2013; Tahir et al., 2013; Porter et al., 2014) who mentioned that policies provided by institutions' administrator helps to develop and facilitate BL adoption. More specifically, the results point out that administrators' advocacy provide enthusiasm and cooperation that supports BL adoption in their institution to deliver the needed structural resource supports for teaching and learning (Tahir et al., 2013). Additionally, creating a definition of BL can ease in achieving learning objectives for scheduling lectures, providing students with reliable and clear prospects regarding BL approach, and developing suitable support initiatives (Moskal et al., 2013).

With respect to H2, resource support influence on administration readiness to diffuse BL, the result shows a significant relationship, where this result is consistent with those reported by previous studies (Ahmed, 2010; Carbonell et al., 2013; Ghazal et al., 2018) which confirmed the effectiveness of management support in promoting BL adoption. In this regard, resource support which entails provisions of sufficient resources to support students achieve their learning goals and lecturers in improving their teaching is important in improving BL diffusion (Poon, 2014; Yeop et al., 2016). Thus, if there is no support provided to promote BL, students and lecturers are not likely to be motivated to adopt BL (Basir et al. 2010). Regarding H3 which relates to the positive and significant impact of management strategies on the readiness of administration to institutionalize BL, our results agree with those found by Chong et al. (2010); Graham et al. (2013); Kuar (2013); Porter et al. (2014); Bowyer (2017). In fact, as observed by Tahir et al. (2013) management strategies comprises of institutional educational committee members concerned with overseeing the adoption of BL. Institutional management defines strategies related to improving the sustainable and effective use of IT to achieve established BL goals (Graham et al., 2013; Porter et al., 2014). In addition, administrators should have a strategic roadmap to help determine who approves how BL courses are to be taught in the institution such as the ration of 20-80, 30-70, or 40-60 for F2F and online learning (Chong et al., 2010; Poon, 2014).

Besides, for H4 our result regarding the relationship between available technology infrastructures and administration readiness to diffuse BL are in line with the research conducted by Basir et al. (2010); Al-Busaidi (2012); Springs et al. (2016); Ghazal et al. (2018), which also reported positive direct effect. In this sense, our result indicates that the deployment of required technological infrastructure is essential for effective BL adoption (Porter et al. 2014). Similarly, the result is analogous with findings from the literature (Ahmed, 2010; Porter et al., 2014) where the authors stated that management decisions to invest in technologies predicts effective BL adoption in higher education. Thus, it is obvious that institutions seeking to adopt BL must provide basic technological infrastructure necessary for effective BL adoption (Moskal et al., 2013). In addition, for H5 the result reveal that ethical issues to be considered in the institution significantly predict administration readiness to diffuse BL. This result supports the conclusion made by Fleck

(2012); Moskal et al. (2013). One possible explanation for this result is that BL policies initiated in institutions that explicitly state the rules and regulation relating to ownership of course materials, editing, circulation, and rights privileges of learning course materials designed by lecturers will influence how such materials are disseminated and utilized for teaching and learning (Roszak et al., 2014). Thus, it can be anticipated that providing ethical considerations policies initiated by the institution will motivate academic staffs to design and develop improved educational resources and course materials (Graham et al., 2013), that can be easily disseminated over the internet during blended courses. Hence, lecturers' original idea is saved, and this protects the institutions from future legal issues (Basir et al., 2010).

6. Implications of Study

6.1. Theoretical Implications

This article provides useful insights and implications for academicians, educators, and policy makers on BL diffusion in higher education mainly from the administration perspective. Respectively, this study develops a model to investigate the variables and factors that influence institutions administration readiness to diffuse BL initiatives based on diffusion of innovation theory and institutional BL adoption framework that comprise of mature implementation stage of BL. Specifically by adopting the developed model, universities, colleges, and polytechnics will be able to better identify institutional strategy, support, and structure initiatives that provides information based on the variables and related factors (see Figure 3) to determine their progress in diffusing BL initiatives. In addition, the model provides awareness on issues institutions should consider to successfully transiting from exploration/awareness of BL to early implementation and eventually mature implementation.

In this study, the authors have outlined a number of variables (institutional structure, resource support, management strategies, technology infrastructure, and ethical consideration) and associated factors to institutionalize BL policy in higher education. It is evident that the diffusion of BL in institutions requires support from management as well as consistent student learning and lecturers teaching support mechanisms. Findings from this study suggest that the variables presented in the developed model should be adopted by administration based on the factors and derived items (as seen in Table 3) in achieving an institutional culture that is both reliable and responsive in diffusing BL approaches. Obviously, the diffusion of BL initiatives in any institution relies on adequate investment of technical, pedagogical, financial support. Likewise, our results confirm the necessity of providing adequate pedagogical and technical support not only for academic staffs, but also for students who may lack the required skills needed to succeed when employing BL approach for teaching and learning.

Grounded on institutional BL adoption framework by Graham et al. (2013) which comprises of strategy, support, and structure key recommendations from this study advocates for institutional administration to establish a common BL implementation vision/mission, provide resources, and define teaching and learning outcomes. Furthermore, findings from this study

suggest that institutions should include the need to adequately deploy technological infrastructure that facilitates BL diffusion as well as the need to provide pedagogical and technical training to support transformation of F2F courses to fully BL experiences in an approach that assimilates the best elements of offline and online learning. Moreover, findings from this study provide effective resources to support BL initiatives in providing information that supports effective decision making at both instructional and policy levels. Thus, our findings provide a roadmap to guide institutions to strategically diffuse BL in higher educational institutions.

6.2. Practical Implications

Findings from this study offer some practical implications for educationalist, researchers, and educational management. Practically, the developed model supports the assessment of administrators' readiness to diffuse BL approaches available in their respective institutions and how the impact will be measured either before any adoption occurs or based on their current implementation policies. First, it is important for administrators to become aware of how to best diffuse BL approaches and how they can take control and manage the overall BL implementation in their institutions. Findings from this study can be utilized to guide institutions in both developed and developing countries to initiate effective debates and discussions that shape discourse on BL continuity. In addition, the developed model can be adopted to design policies, practices, and develop a culture that supports continuance improvement of BL approaches in universities, colleges, and polytechnics. Moreover, this study provides insights on how to improve the quality of institutionalizing BL adoption in Malaysia higher learning towards enhancing the current state of the art and state of BL initiatives.

The model developed can be deployed as a tool based on the derived factors and items as developed in Table 3 to inform decisions made by policy makers, stakeholders, and governments in improving the performance and quality of teaching, research and education in enhancing the quality of learning in Malaysian academic units and beyond. Since higher education in Malaysia and other neighboring countries in Asia and other continents initiates educational managerial committee that oversee the running of BL as well as F2F learning. The factors can be deployed as checklist to assess the current educational teaching and learning systems. Moreover, specific academic units such as the internal and external monitoring and evaluation department that exists in higher education worldwide established by the Ministry of education such as in Malaysia that accredits teaching and learning approaches could particularly benefit from the model to perform inspections and certifications of BL approaches diffused in various institutions across the world.

Specifically, this study provides pertinent strategy, support, and structure to institutions interested in diffusing BL with information concerning how their decisions regarding F2F and online learning may influence administration adoption. Correspondingly, findings from this study are important to be utilized as a reference for the organizing methodologies to embrace BL in Malaysia and other countries such as US, Canada, Australia, etc. institutions. This article provide insight to institution's top management on their adaptability and readiness for future implementation of BL approaches by identifying administrations readiness to diffuse BL practice in their respective institutions. Additionally, the developed model also provides insights for administrators on institutional factors needed to support diffusion of BL by empowering innovate

use of BL and supports cross-disciplinary practice-based approach to create and inform institutional-wide practices for BL adoption.

The study contributes to a better understanding of BL initiatives from the lens of administrators and offers insights to institution managers in improving blended course management towards enriching teaching and learning quality in refining institutional strategies. Thus, the model can be employed as a guide to plan, develop, deliver, manage, and evaluate BL programs for higher education. Furthermore, this is one of a few studies that provide evidence and concept regarding institutional administration readiness to evaluate if processes are in place to facilitate students and academic staffs learning and teaching. Therefore, the model can evaluate institutions administration plan, technical (hardware, educational software, network access), pedagogical, and financial commitment towards diffusing BL practice in their institutions.

Thus, this study proposed a readiness concept to provide a goal for institutions towards developing their capability to adopt BL approaches. Respectively, the developed model can be utilized to assess the current status of higher education in relation to where the management envisions the institution to be based on an already set milestone. Lastly, the instrument developed in Table 3 can be employed as a benchmarking academic performance application based on each variable and factors to provide vital information on program/course design or revision to develop initiatives as well as schedule for assessing their readiness to diffuse BL in their respective institutions. Also, this provides a link to align the findings from this study to real world practices in higher education.

7. Conclusion

Currently, there are fewer studies that investigated the involvement of educational managers and administrators to assess the level of readiness of their institutions towards diffusing BL initiatives which possess the capability to address a number of teaching and learning challenges faced in higher education. Therefore, there is need for strategic institutional changes which will only occur if there is a shared mission, vision, and purpose within the institution. Yet, prior studies mainly focused on issues related to students and academic staffs in improving teaching and learning effectiveness, only few studies focused on institution's readiness and diffusion issues. Accordingly, this study develops a model based on diffusion of innovation theory and institutional BL adoption framework to investigate variables and factors that influence institutions administration readiness to diffuse BL initiatives to examine the growth or mature BL implementation in Malaysia universities, colleges, and polytechnics.

The developed model was validated based on data collected using a survey questionnaire instrument from e-learning administrators/managers in Malaysia universities, colleges, and polytechnics. After which the collected data was analyzed using PLS-SEM. Overall, the results reveal that the institutional structure, management strategies, resource support, technology infrastructure, and ethical consideration significantly predicts administration readiness to diffuse BL. Moreover, results from the survey data indicate that institutional strategy is the most important and performing variable that enhances administration readiness to diffuse BL in their institution.

Although, innovation in BL practices may bring abrupt changes in teaching and learning, bridging the gap between F2F and online mainly depends on the attitude, willingness and motivation of institution management towards BL initiatives.

Irrespective of the contribution from this study, there are limitations that are worth mentioning. First, the sample was collected from Malaysia institutions only. Thus, more research is required to be carried out in institutions from different countries to improve the results and provide more significant insights into administration diffusion of BL approaches. Secondly, there is need to examine other related factors that are not included in DOI theory and Institutional BL adoption framework such as the culture, norms, etc. Third, in this study, data was collected using survey questionnaire instrument only, thus there is need to employ case study to collect data using interview instrument as employed by prior BL studies (Machado, 2007; Carbonell et al., 2013; Garrison and Vaughan, 2013; Graham et al., 2013; Moskal et al., 2013; Taylor and Newton, 2013; Porter et al., 2014; Spring et al., 2016; Porter et al., 2016), to supplement the survey data in providing more insight regarding the variables and factors that predicts administration readiness toward BL diffusion. Thus, interview instrument will be designed based on the derived factors to collect qualitative data from top institutions leader in Malaysia institutions to carry out explorative study of the current BL approach diffused in various institutions.

Besides, such interviews data might draw from the growth maturity or implementation spectrum of BL adopters or focus on either exploration/awareness or early adoption. Moreover, there is need to collect data from top institutions leader such as Deans, Departments Chairs, Academic Program Coordinators since the data was collected from mainly e-learning directors, managers and coordinators. Additionally, there is need for further examine the importance and impact levels of the identified variables by employing another empirical test such as chi-square test or Root Mean Square Error of Approximation (RMSEA) analysis in another statistical tool such as SEM-AMOS to corroborate and strengthen the results from Importance Performance Map Analysis for effect size determinations towards improving the construct validity of the questionnaire instrument and third research question. Lastly, the questionnaire items employed to measure the developed model will be utilized to implement a practical BL assessment tool for administrators/policymakers to evaluate their readiness to adopt BL in their institutions.

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