Hypothesis
Satisfaction Measurement in the Blended Learning System of the University: The Literacy Mediated-Discourses (LM-D) Framework

Muhamar Lubis *, Muhammad Azani Hasibuan and Rachmadita Andreswari

School of Industrial Engineering, Telkom University, Bandung 40257, Indonesia
* Correspondence: muharmanlubis@telkomuniversity.ac.id

Abstract: Effective incorporation of new technologies into the education system has become a basic need in today’s globalized world, especially in adapting to the new normal, which is seen by an increase in online learning. Thus, a blended learning system (BLS) becomes the alternative solution to enhance the effectiveness and efficiency of the online learning system by adding certain characteristics from the traditional approach to the online learning system. Therefore, the educational institution still has reluctance to adopt this kind of system as a means to deliver knowledge to the student due to several reasons, such as remote effects, learning progress assessment, alignment of the course roadmap to learning strategy, self-paced environment support, retaining lecturer authenticity, quantifying informal learning, and engagement of the student community. Thus, this study wants to investigate factors that influence the satisfaction of students in terms of using mediated communication consisting of the modules, the channels, and the lecturers as the component to evaluate the understanding of literacy within offline and online classes. In fact, satisfaction is a threshold target for the BLS contribution in bringing the discourses aligned with the demands as well as delivering necessary value for the related users. Interestingly, the results showed Computer Self-Efficacy and Expectation of Quality have valid and reliable value as well significance within the proposed model.

Keywords: digital literacy; blended learning; satisfaction framework; measurement

1. Introduction

Information and Communication Technology (ICT) as an aid to teaching models can provide valuable learning resources for students with personal skills and professional competencies needed for their development. Thus, these tools can expand the concept of education by creating new training spaces among members of the educational community. The department unit, especially the informal educational institutions, have shown interest in the form of initiatives that lead to the adoption of the Blended Learning System (BLS) project to be fully implemented in their learning environment. It is important to take a note that the objectives of decision makers and employees must be consistent and aligned if the BLS initiative wants to be a success. Of course, it can be difficult to gain institutional consensus due to unfamiliarity and discomfort with this kind of platform. Therefore, initial steps should be performed through identifying several problems in regard to the adoption of BLS. They can be summarized as the unavailability of infrastructure, harsh and strict administration, demotivated and improper lecturers, and lack of other supporting infrastructures such as parking, laboratory, residential and cafeteria, and even toilet becoming important as consequences of the remote learning process. As a result, it may feel very difficult to link BLS to an institutional structure and strategy that often refers to a formal type of teaching and learning, which should present a standard measurement and accreditation process. Unfortunately, the government regulation policy also shows resistance by providing no reliability to the platform due to a shortage in engagement and fear of the technological impact of responding slowly to the initiative, especially related to the learning progress.
assessment and the alignment of the course roadmap to learning strategy. Still, after the pandemic, which occasionally showed the degradation of the learning–teaching process, the accommodation presents greater light, although, at a certain point, it only refers to one of each: the traditional or online mode of the learning process. In some cases [1–3], some members of the institution may tend to suspect top-down initiatives to negatively affect the activity process along with the focus shift on quality, intellectual property, and ownership. Thus, successful implementation cannot be achieved without a comprehensive dialogue between the parties concerned and involved.

A brief history of online learning with full body initiatives shows huge gaps in understanding between executives, management, and faculties to have never been satisfactorily completed by every stakeholder, although many attempts have been made to coordinate the different opinions [1,2]. It should be considered that educational institutions have a greater and supreme purpose of the enrichment and enlightenment of the life of the nation, not merely profit-oriented. Meanwhile, the complexity of the session management in BLS requires dedicated technical staff and ongoing support. When students and their lecturers enter the classroom on time, they have every reason to hope for a learning process to run smoothly, with an intervention mechanism to monitor the fluctuation of motivation and the reliability of progress. The student may learn the courses differently and alternatively based on their expectation for freedom in the form of auditory, project-based, or experience-based learning or, perhaps, visual presentation. On the other hand, the extension to the internet environment is also critical to enable full capacity of the content resources offered as soon as possible. The complexity of content management systems, maintaining network connectivity, bandwidth levels, and even the release of programs installed on a student’s computer may discourage the replication of the layer’s reliability. Thus, these features are extremely important in order to create a self-paced environment that encourages the attachment and autonomy of students. In addition, policy development in the required time should be established, with tight assessment and measurement to support the expected quality of BLS before problems arise and grow exponentially until they become a convergence point of complex resistance.

Typically, the policy development should be addressed in the initial initiative, especially those relating to the ownership of intellectual property, copyright, and the workload of each member of the institution. One important aspect that should be considered is related to retaining lecturer authenticity that brings the ‘WOW’ factor and becomes the inspiration for students. For the material, the presentation can be converted into digital content easily but the surrounding nuance and the building atmosphere become big question marks, which might result in a lack of concentration and a deep understanding of the student towards the subject. The moment often occurred during a live event, but frequent interactions should be built up first, in which both sides have enjoyable and sophisticated discussions and conversations about many things within the broad range of topics presented. Thus, the policy should shape the aligned procedure with the necessity of enhancing the technicality of the implementation. On the other hand, quantifying informal learning from the student is also quite challenging, even though quizzes or assignments have been provided in the system, but it seems lacking in terms of students attempting to express their understanding in an active manner. Thus, the creation of a student community is needed in order to monitor and coordinate the dynamic process of learning, which may involve a sudden drop in mood and interest in learning and also support the interaction between student peers.

The most sensitive aspect of developing BLS initiatives is to gather the willingness of institutional members to participate. Initially, almost all members had doubts about various things in the implementation process such as monitoring, evaluation, recognition, and workload. Thus, the search for success factors can facilitate the commitment of concerned members and, in the long-term, reduce their fears, especially when the institution has produced an evaluation process of its own. In the early stages of adoption, critics often referred to those who did not participate in BLS or whose primary participation was not positive, which focused on performance, but later on, the collaborative mindset
should advance it. These kinds of problems often cause current institutional procedures or employee agreements to be adjusted later on to address some of the requirements arising from the adoption of the BLS system. Therefore, it should be noted that successful adoption is primarily related to the appropriateness of the policy development that accommodates the needs of the stakeholders. Moreover, understanding the perceptions of the students and lecturers is also very important to provide some ideas for better improvement, either through suggestions or recommendations in assessing and evaluating the use of the BLS in the learning environment [2,4].

In general, Rogers has developed one of the most well-known theoretical methods to spread innovation and adoption behaviors [3], which is very useful in determining specific practicality to influence the potential customer mindset and to decide upon components or features that require additional effort in case of proliferation. It cannot be denied that the educational sector has evolved to become a new type of industry that gains high pressure from student demand as well as government rules for achievement and compliance, which often relate to their satisfaction with the learning and teaching system. This includes the consideration of new technology systems, methods of communication, steps in decision-making, and equality of the social contexts. Using this diffusion of innovation theory as the basis for reporting this research hypothesis, development is useful for a number of reasons. Besides the former, the clear persuasion factors offered and segmenting scheme within the theory also helps to explore the framework to measure the objective. Other theories are also involved in the discussion because they provide several insights and resourceful ideas into the form of readiness, the impacts, the performance measurement, and the learning dimensions. In short, BLS can be defined as the utilization of potentiality face-to-face and online methods through a learning management system (LMS) platform with a hybrid and dynamic learning style in order to achieve a personalized and integrative approach.

This study examines digital technology and teaching practices by highlighting the techniques and practices of lecturers based on the institution’s capability, rather than those of the researchers, which will be clearly explained in the research method. In addition, many prevalence studies focus on customer satisfaction theory [4] or the extent to which tools or practices can be disseminated through institutions [5]. Interestingly, various BLS strategies were identified, namely, collaborative-based instruction, LMS, social media application, and technology-based instruction. Of course, audio–video material is primarily used to tackle reading and speaking problems among learners, while mobile applications and augmented listening as well speaking activities are supportive to increase engagement, motivation, and self-improvement [5]. Rather than investigating precisely how fast digital technology spreads within universities or schools, this study examines the narratives of key individuals responsible for successful implementation, which are the students, by identifying their perception of the mediated platform to improve literacy through several discourses which lead to satisfaction, then influence their understanding and performance in the end.

2. Blended Learning Concepts
2.1. Blended Learning as Mediated Platform

Basically, knowledge can be viewed as something to be acquired from outside, a cognitive state of the person as a result of a thought process or a meaning constructed by social interaction [6]. A study demonstrated that the more students’ achievement level and frequency of participation in the forum raises, the more positive view they express, especially in relation to BLS emphasizing the significance of interaction–communication [7]. When designing a BLS program, the students and lecturers should be aware that an outcome-based curriculum should be aligned with institution expectations and understanding that the collaborative nature of a new learning endeavor requires a balance between motivation, and content [8]. On the other hand, the individual antecedent (self-attitude, self-behavior, self-cognitive, and intention to comply) does appear to be insignificant compared to organizational (policy compliance, training program, and security threats) and environment
antecedent (peer performance, social pressure, and religious indicator) in leading students to emphasize their role and responsibility in the higher educational system [9]. Conceptually, mediation allows for the improvement to be conducted through proper routes and acts on controlling and processing the information for facilitating the settlement of different discourses and resolving any potential conflict that has a tendency to lead to escalated disputes among relevant stakeholders.

In many institutions, the adoption of BLS has coincided with growth of at least single-digit annual rates. One of the most important steps for institutions to start BLS programs is to build a structure for central and longitudinal data collection for monitoring and evaluation purposes [8,9]. In addition, there are various factors that should be considered to ensure the success and efficiency of BLS’ implementation, such as the appropriate technology tools that adapt to each student’s abilities, the instructional program that could capture student data comprehensively, the curriculum that suggests and recommends to the lecturer to perform next steps or stages accordingly, and, most importantly, the platform that provides sufficient resources and material to conduct teaching and learning comprehensively. Moreover, learner interactions were seen from three angles: cognitivism, collaborative learning, and student–lecturer interaction, from which technology quality will be evaluated based on its availability (72%), content (71%), intervention (69%), chats (69%), resources (68%), internet reliability (66%), and email exchanges (63.4%) [10]. Characteristics of the student population, mission of the institution, the strategic planning processes, faculty responsiveness, student acceptance, community values, available resources, institution support mechanisms, and many other components helped to frame BLS in a way that made sense for a particular institutional context [11]. It is necessary for the mediated platform to combine many ad hoc networks into the integrated point for the optimization process, in which interactivity becomes the way for communication. All participants should be encouraged to express themselves, because literacy discourse can be improved through conversation, cohesion, and dedication.

2.2. Blended Learning as a User Satisfaction System

One of the success criteria of basic information systems is user satisfaction, the assessment of which becomes the determinant for measuring the value and effectiveness of information system investments. In the past, it was used to synonymously indicate the success of information systems, which has an important function for the examination of weakness in order to align the institutional strategy with user demand. This sentence is issued by the user, from positive to negative, concerning certain characteristics of the information system. In addition, several determinants of user satisfaction were evaluated and investigated on how users perceive their acceptance level according to the characteristics of the information system and user needs [12]. It is imperative that information systems (IS) play an important role in the administrative and academic functions of institutions of higher learning in developing countries by adopting contextual and institutional variables that can lead to the success of information system projects. It can be clearly observed that the satisfaction of project stakeholders is an important problem to measure the success of a project that refers to the contextual aspects and project environment [13]. Considering that BLS requires huge investment costs in the network and building infrastructure, the stakeholders play the pivotal role, one that does not merely rely on the importance of the investor but the other supported components, such as the technician, lecturer, employee, and, of course, student. If an effective system is defined, through the measurement of user satisfaction, as one that provides value and competitive advantage, it will influence the decision making, improving productivity and employing context significantly.

People often express an assessment of satisfaction or dissatisfaction with their past experiences with brands, films, jobs, and government in power throughout their lives. This assessment, which is often easier to collect from objective data, has been widely used by psychologists, policy scientists, and consumer studies to predict repeated purchases of a trademark or election results, and to describe the happiness or self-well-being of
different segments of the population [14]. The scheme seems plausible in respect of the qualitative approaches that have a tendency for subjective evaluation, often only involving small scale, reduced fragment, and sporadic mechanisms. Thus, the chosen approach to understanding user perceptions should be based on the differences between expectations and performance evaluations, which are normally in regard to the quantification process to ensure the response can be conducted as soon as possible. This requires researchers to draw separate and critical information from the user experience in terms of service expectations and perceived performance. Arguably, some performance standards tend to be considered equivalent to the rule in the control of products or services from the institution if the user participation is mutually involved in the internal business process. However, when the distance from this criterion is large enough, the perceived performance to be outside the accepted area will be considered to be different from the rule, and the assumption will also cause considerable dissatisfaction with product evaluation [15].

Of course, in order for BLS to be successful, concrete support from the government is required, especially to provide guidance and direction in the form of regulation. In addition, when measuring student satisfaction together with learning effectiveness and lecturer satisfaction, the mixed pattern and learning groups can produce positive results coherently in sense of the content and the system interaction. Although most results show satisfaction among users, learning support is still needed to facilitate BLS in different learning styles and cultures. There are several key factors that influence student satisfaction in BLS such as e-learning adaptability, perceived benefits, lecturer response, ease of use, and application use. Moreover, experimental results also indicated that computer self-efficacy, performance expectations, system functions, content characteristics, interaction style, and learning climate are the key determinants of student learning in a BLS environment [16]. Students often spend a lot of time and money and make great efforts to get a good education, and should consider the experience of post-secondary education to be of the high value. Thus, student satisfaction is important because it affects student motivation as a critical factor leading to success. Meanwhile, exceeding the expectations not only satisfies students but also guides them to become advocates who offer free promotional resources to the institution as the active omnichannel, which elevates their status in the community [17–19].

2.3. Blended Learning as a Knowledge Dynamics Environment

In fact, lecturers, families, and board members indicated that schools or universities were not adequately equipped in terms of networks and facilities. This kind of situation often occurred when motivation and implementation preceded the readiness of the learning institution. However, there are various reasons underlying this situation due to the large financial investment to replace and redesign computer resources in institutions [20]. In order to allow a knowledge dynamic environment, facilitators can take advantage of virtual classrooms to facilitate student participation in simultaneous sessions, such as break rooms for group discussions and chat rooms to answer student questions [21]. After students get used to the platform, they can socialize and communicate on the platform; importantly, the BLS should emphasize personal growth, recommendation, and development. Therefore, the teaching and learning process in BLS must pay attention to the entire scope of knowledge, in addition to knowledge of the curriculum, among others, to develop digital competencies such as learning online, learning from various media sources, and utilizing technology. Furthermore, preparing students for a knowledge-based economy requires a learning environment that supports the development of general skills or general conceptual skills [22]. In comparison, online learning environments can provide students with information about various aspects of the curriculum, can cover learning deficiencies in the classroom, and can provide online learning resources for them.

Given the relevance of online resources, it is becoming increasingly important to assess students’ online learning outside the classroom and measure their academic performance based on formal and informal learning. Many lecturers believe that learning cannot be recognized without observing the learning process and worry that learning effectiveness
cannot be guaranteed outside the classroom. As digital content is often stored and maintained in the LMS platform, the role and task of the lecturer can be directed to focus on encouraging active participation from students in the analytical and discussion process, for which the theoretical learning can be performed autonomously. Moreover, supportive, personalized, and interactive experience accommodate flexibility and accessibility. It is important to raise awareness of the requirement within the knowledge dynamics environment, such as the implementation of the digital badge, course fulfillment, student label, student of the week, student profile, and student comments within the content material [23]. On the other hand, sustainable development of the environment within blended learning should be considered as well, which refers to allowing the meeting of people’s needs, ranging from tangible needs such as accommodation and logistics to intangible needs such as appreciation and equity [24]. Interestingly, the effectiveness of knowledge transfer can occur to a specific process in regard to the role of knowledge and institutional learning within a highly dynamic environment by intensifying participation.

Language was always the deterrent in the learning process, in which a certain mother tongue has an implicit meaning or dialect or even intonation that may change the meaning of the received message conveyed in a different context. It is expected to not leave out the existing resource due to unconfirmed knowledge but to invite more discussion in relation to training, workshop, seminar, and discussion as well as accessible and comprehensive documentation in the form of text, visual, audio, and video. The knowledge transfer in the dynamic environment is easier to conduct in a practical and functional way if the top executives have supported the development by facilitating the attempt to build the robust capacity of BLS and the absorptive IT staff’s capability through continuous monitoring and improvement. It might not necessary to redefine, redesign, or even rebuild every process within the institution towards the implementation of BLS as the nature of a knowledge dynamic environment characterized by constant change or progress. It caused stimulation of the adaptive process with the directive control from the lecturers or even assistants to advance the learning process to be vital for the positive attitude and empower new ideas and discourses.

2.4. Blended Learning as an Alternative Entrepreneurship Approach

The central and provincial governments must ensure fast and stable internet connections, subsidized quotas, digital device assistance, and digital capacity building. Meanwhile, school or university capacity depends on the capital owned by them, such as infrastructure that supports the online learning process or through supplementing the supported resource such as certification, competence, regulation, or allowance. On the other hand, parental involvement is also essential for the success of online learning as the one that observes the learning activity and motivators in the state of struggle. Then, the creativity and interactivity of the lectures in designing and providing online learning for students also play a crucial role in regard for achieving the expected learning outcomes [25]. On the other hand, BLS that is built into the entrepreneurship paradigm is able to develop the ability of innovation and creativity, so that students are well prepared to meet the demands of learning in a complex and unstructured field. It also creates the spirit to take on risks by gaining more benefits through trial and error, by following the plan accordingly. This can be achieved by developing BLS applications to cater to private and informal situations by providing flexible resources and interference. The purpose here is to increase student participation, which allows them to discuss beyond the topic of material used within the course. BLS also should aim to allow the innovative mind of students to grow through features that can be utilized in enhancing their skills and ensuring quality, either through adjustment or evaluation. Ultimately, it is not an easy task; BLS must allow the user to feel comfortable in using it, while the lecturer must act enthusiastically to listen to the discourses established in the learning process.

Of course, proper education always faces certain challenges, especially to convince service providers to put their trust in BLS and teaching the person in charge specific mecha-
nisms and techniques that align with the learning curve to obtain expected program and learning outcomes. Meanwhile, at the same time, it also challenges the status quo, which is mostly dominated by seniority concepts, which are uncomfortable feelings to change, so the balance process of both approaches should be conducted carefully, as the resources used to optimize can become counter-productive [26]. On the other hand, blended learning disappointments were often related to the use of multimedia, self-assessment testing, access to digital literacy, and collaborative activities. On the other hand, other features such as course management, materials used, lecturer involvement, and timely feedback were well perceived [26–28]. Interestingly, BLS is becoming increasingly popular for several reasons including cost-effectiveness, increased awareness among students, suitability of different learning styles, flexibility, and reduced student anxiety [27,28]. Therefore, intention to comply, risk threats, and religious indicators have a positive impact on the process of teaching and learning, although, it should be noted that the majority of students are eager to have risky behavior related to information security [27]. Regarding practical contributions, effective methods of implementing online learning courses, advantages of hands-on or online language learning, factors that negatively affect its effectiveness, problems, and challenges that lecturers and students have to face should be discussed in detail due to different circumstances [28]. Thus, the features of entrepreneurship should be imbued in BLS accommodation by optimizing the utilization of resources, defining the performance measurement, and risk strategy of anticipation.

2.5. Blended Learning as Literacy Mediated Discourses

As higher education faces the challenges of providing a cost-effective and high-quality learning experience, BLS offers the potential to be a relevant platform, although, in some contexts, they fail to fulfill their promise due to the lack of understanding of appropriate strategies to match the diverse culture of students; mostly, they fail to provide flexibility and efficiency [13,29]. Interestingly, there is a growing number of schools and universities who still believe in the concept of BLS as a proper and right solution to bridge the literacy discourse as a mediated platform by conducting several pilot projects or implementing BLS programs to anticipate the future challenges in a small scale or within a certain phase [14,30]. In addition, organizing information and content structure into a conceptual framework allows for greater transfer of knowledge in the learning environment by focusing on the cognitive process of sensory memory through experiencing the information to obtain long-term memorization by working together with colleagues and instructors [6–8]. Separate and isolated processes seem to only lead to dissatisfying results, and difficulty remains for a long time as the working culture, so the target to achieve the maximum benefit will end in no time. Several constraints and limitations involved can be identified, such as the different nuances and atmosphere that depend on the skill and mood of the lecturer as well as the possibility of a way of learning that tends to stick to a monotonic type, such as project- or problem-based, which might become resistance for the student. Actually, BLS is not just about promoting online activities or computer-enhanced learning, but the challenge is to ensure students’ critical thinking skills, which can be initiated through digital technology, where future citizenship seems to be slow in response and difficult to express, then certainly, the initiative to change the pattern and lifecycle of a certain community is extremely difficult, with the needs of digital literacy in new media becoming compulsory [31].

As a result, many institutions need to determine proper policy decisions, coming to adopt BLS as a front-end system when considering a user experience that combined both the positive impact of online and offline approaches. Unfortunately, many BLS models create confusion among the adopter to choose the most effective and appropriate method for a specific context based on several requirements and complexity in prioritizing the features [9]. However, the developed innovation in the culture and climate of each institution must adapt to the dynamic conversation and interaction within the institution. On the other hand, data storage demands also increase rapidly and concurrently, so institutions should
plan carefully and collaboratively with their suppliers and content creator to assure sufficient capacity and reliability are delivered to meet student needs. Moreover, at the same time, it also requires establishing the reliability and scalability plan to increase or decrease the size or capability of the infrastructure, especially related to network performance involving bandwidth, throughput, and other non-function abilities as the usage fluctuates based on demand [18]. Of course, the architecture plan cannot be neglected, which comprises not only related to security, but also scalability, prioritization, customization, personalization, and quality of service. Ultimately, having literacy can provide a means for the student in relying upon their skills for identification, understanding, collecting, analyzing, and interpreting particular cases systematically that might have occurred in their working life. It refers to a set of practical competencies to calculate, explore, and confirm the purpose with the outcome, through a comprehensive process of decision making and working well. Therefore, the data collected, together with the participation of the content creator in the action plan, can provide added value to the BLS platform by creating a potential connection between practices and qualification for promotion or improvement, demanding a critical approach [32].

3. Theoretical Framework
3.1. Diffusion of Innovation Theory

Diffusion of innovation is the theory that explains how certain influenced factors shape innovation and encourage adoption in terms of consumer decision-making towards services and products offered. Everett Rogers [3] provided a framework for the nature of marketing strategies for the company when the introduction of a new product and service takes place and in order to reach a new market segment. Underlining the importance of separating the customer into several attributes and characteristics can help understand the kind of proper communication and type of channel that can be utilized to deliver the added value. The aim of the theory is to explain the key reasoning behind adopting products or services by perceiving them as innovative. The accumulating risks and allocation of scarce resources by companies in their business strategy allegedly bring efficiency and boost profitability over a long period. Therefore, several critiques point out the issue of internal consistency, which examines the drastic changes that occurred in the landscape over decades. On the other hand, equality might be questioned, but the questionnaire is not distributed to a broader audience, while the recall problem also exists in relation to the remembrance of the customer in a certain event. Another criticism is that many people misinterpret it by thinking that innovation is a personality trait, but adopters often fall into different categories for different innovations. Therefore, while the same person lags behind on one innovation, he or she may be an early adopter of a different type of innovation, for which the trail determining the continuity of the adoptions can be seen in Figure 1.

On certain occasions, technology can present a discontinuous type of product and service while being misaligned with the adoption curve, which tends to be continuous. On the other hand, monocultural situations usually bring different kinds of separated markets, though within a similar customer segment looking for validation of their purchasing decision [12,13]. Interestingly, certain markets also have resistance to evolving with their existing operation and seeking productivity improvement rather than diversification or innovation. When an innovation matches the values offered, requirement analysis, and customer experiences of its adopters, the idea for an innovated product and service has the power to capture it. Innovations must have a relative advantage over available technologies that can replace them, as they must be compatible with the current social or technological mechanisms, and they must be simple and intuitive to be used by a larger group. From the consumer’s perspective, it must be easy to experience, and, finally, it must be visible and obvious to attract potential users to trust the benefits, such as usability and functionality. Of course, there is no theory in a vacuum due to the necessity to adapt to the current developments in order to remain relevant. As the educational sector shifts to become an industry that wants to commercialize its digital content and knowledge management,
several theories from business, communication, and even psychology, such as diffusion of innovation, can be considered for strategic and policy development.

![Figure 1. The Everett Rogers’ Diffusion of Innovation [3].](image)

### 3.2. Student Online Learning Readiness (SOLR) Model

General skills are core competencies that are transferable across contexts and enable personal and professional development, such as creativity and learning-to-learn competencies. Furthermore, increasing globalization requires students to be able to collaborate across borders and develop a global mindset or global character. This requires the internationalization of the curriculum as an indication of student’s online learning readiness. Commonly, people tend to believe that their doubt can be neglected through justification, certification, accreditation, and adjustment of objective by a popular or authorized third party. An additional task, not just related to delivery methods, is that blended learning must inspire higher values in students as well as a wider perspective on the world [22]. To bridge sustainability means changing behavior to create a better and friendlier relationship between the environment and people, which relates to the social characteristics that people want to maintain or improve within the environment over time [24]. In this model, the readiness level becomes the priority to enhance student satisfaction through the competencies within social, with instructor and classmate together with communication and technical [33]. Meanwhile, the outcomes and the retention influence satisfaction through academic integration by helping students for forming learning communities.

Readiness for online learning can be defined as a situation in which students can undergo the online learning process to increase their understanding and technical skills by utilizing communication devices, communication skills, and the ability to interact with teachers and other students within the same platform, as can be seen in Figure 2. Thus, Yu [31] mentioned that technical competencies, social competencies with classmates and instructors, as well communication competencies become the basis of the readiness of the online system to prevail. There are challenges among learners of online platforms due to the rapid transformation of the learning environment, which can affect student self-efficacy as well as technical difficulties or internet connectivity issues. Meanwhile, communication difficulties, disruption of audio and camera systems, and lack of knowledge in using applications and tools reflect students’ willingness to learn online. Interestingly, self-direction or self-monitoring can show value in saving time and space for reflexive learning and increasing academic success in online learning. Orienting oneself to be
persistent in educational challenges will make the person more independent through a process of group learning driven by self-management and individual input. Unfortunately, many distance learning scenarios focus on online curricula where students focus solely on what is happening on a computer, tablet, or smartphone screen, without any response or initiative to learn more about the material through discussion or reading other materials independently.

Figure 2. Taeho Yu’s Student Online Learning Readiness (SOLR) [31].

3.3. Impact of the Student Satisfaction Model

The ability to work in smaller groups and interact more with peers gives students pleasure and satisfaction during the learning process. Since the traditional approach is more personal and involves close interaction with peers, students may feel happier on this type of learning path, which in turn leads to greater satisfaction [34]. In addition, there are a number of challenges associated with moving entirely to online learning, such as difficulties in designing and developing online learning programs, and the fact that many students do not have access to online platforms and/or cannot use them on their own [35]. Lecturers also expect students to be accustomed to asking about concepts that have not been mastered in order to gauge how well students understand the delivered material. Thus, an effective blended learning environment is essential to ensure a pedagogical approach using integrative and collaborative learning, where online learning focuses only on the adoption of surface technology rather than the process of conceptual change while offline focus solely on quantity over quality [36], as can be seen in Figure 3. However, it should be borne in mind that faculty, students, and the management team should be comfortable first with the teaching style on campus. One of the theories presents that perceive value, financial
support, environment, service, internalization, faculty, image, expectation, and loyalty have a key role to measure the satisfaction of students regardless of learning platform used.

The higher education sector has developed in recent times due to new trends, such as increased competition between universities, uptake of education, growth in quality standards, and also students are becoming more demanding. In keeping with this context, universities need to re-evaluate their strategy and receive marketing guidance in order to survive in the market. Thus, the higher education sector is moving to a more competitive market structure that threatens the viability of some of the existing institutions. At the same time, globalization and the digital revolution have generated a demand for new and broad disciplines in education [37]. Meanwhile, communication difficulties, disruption of audio and camera systems, and lack of knowledge in using applications and tools reflect students’ willingness to learn online as a means of preventive control. Interestingly, self-direction or self-monitoring can show value in saving time and space for reflexive learning and increasing academic success in online learning. Orienting oneself to be persistent in educational challenges will make the person more independent through a process of group learning driven by self-management and individual input.

3.4. Performance Measurement Quality (PMQ) Model

Social life emerges as one of the most important factors in increasing student satisfaction with counseling services, social activities, and close working relationships with other students become social constructions that affect student satisfaction. Most students consider social contact and interaction with the outside world to be a major part of their learning experience. Increased competition between academic institutions places more importance on student loyalty than on gaining a competitive advantage. This increasingly fierce and growing international competition has resulted in many universities competing fiercely for students, faculty, and research. In this context, it is important for them to appreciate the strong relationship between student satisfaction, institution reputation, and loyalty. There is no denying that technology-enabled continuing online education has generally been associated with work. Continuing education produces graduates with employable skills and academic success, which prepares them for work [38,39]. However, the difficulty of evaluating the main services provided in the learning platform may cause students, among other aspects, to focus more on the classroom environment and teacher presentation than the course objectives and content of the material. The use of mobile technology as a support in the classroom has been shown to stimulate motivation and improve learning outcomes.
In addition, unlike traditional education, mobile learning provides flexibility in terms of detective control in the learning process because the communication is bidirectional, interactive, and can be customized [40].

In this context, performance measurement is one of the human resource management activities that takes steps to monitor the progress of lecturers in relation to their mission, which depends on the environment, context, and organizational culture. This is an opportunity to emphasize the positives of the implementation while addressing the elements that need improvement in relation to recommendation, repetition, and return of student loyalty in order to evaluate the university and course’s reputation, as can be seen in Figure 4. The score can be used for vulnerability analysis by focusing on job maintenance and satisfaction while promoting personal growth from different kinds of role such as academic, admin, technician, peer, and consultant. Ultimately, student loyalty manifests in various ways, including a commitment to repurchase or subscribe to a favorite product or service, whereas student loyalty comes from satisfaction that is positively influenced by the quality of teaching through active participation and committed behavior. Interestingly, students can become dynamic agents who provide an end-to-end channel through good advocates by recommending the institution to others [41]. On the other hand, the consequences of satisfaction with measuring the performance of education in tertiary institutions are not linear with the consequences of satisfaction with other services, because state education services are non-profit services with many special characteristics. While in most services, complaints about behavior, word of mouth, loyalty, repeat purchase behavior, and profits are presented as satisfaction consequences, some of them make no sense at all at in university. In the end, student loyalty after graduation and reputation is derived from their satisfaction with the learning process.

![Performance Measurement Quality Diagram](image-url)

**Figure 4.** Thomas’ Performance Measurement Quality [39].

### 3.5. Dimension Satisfaction Model

E-learning has emerged as a new paradigm for modern education. Worldwide, the e-learning market has a growth rate of 35.6%, but there are failures. Not much is known about
why many users stop learning online after their initial experience. Therefore, an integrated model with six dimensions: learner, trainer, course, technology, design, and environment, was implemented to investigate the important factors affecting learner satisfaction in e-learning. The results showed that students’ computer anxiety, lecturer’s attitude toward e-learning, the flexibility of e-learning courses, quality of e-learning courses, perceived usefulness, perceived ease of use, and diversity in the assessment were important factors influencing perceived student satisfaction [42]. Self-regulation and learning engagement are positively related to persistence in learning. For blended learning to be successful in higher education, it is necessary to understand how to involve students in the learning process [43]. Today’s e-learning is divided into two main classes [44], including synchronous e-learning, which requires students to be ‘on-site’ in front of their computers or mobile phones at certain times. This type of online learning is less common than other types due to time constraints and the learner’s limited freedom. Then, there is asynchronous e-learning, which is more popular and has the right to have a ‘record’ of lecture learning. This type is more accepted throughout online education as it offers students greater flexibility of time and location. In this model, different perspectives become the emphasis to retrace the focus of corrective control towards the various aspect of features within LMS by responding to the feedback from the learner, instructor, course, technology, design, and environment.

LMS providers are also required to engage with students and faculty to reach agreements and catalogs of specific and desired levels of service that align with learning objectives and functions. Evaluation of the different perceptions of actors can characterize concerns about openness in the relationship of the learning process. It is crucial to have a balance between provider and customer, as information about BLS initiative strategy and goals between provider and customer can be disastrous if hidden. The key factor from the service provider’s perspective is having a common interest when starting a learning process engagement. Similarities with goal sharing, goal alignment, and related management tools were highlighted when reviewing respondents’ perceptions of LMS within implementation. Therefore, the parties involved in the BLS initiative should share the risk by making joint investments to prevent or reduce opportunistic behavior by sharing the gains or losses from any increase or decrease in interaction and communication, as can be seen in Figure 5, in regard to the dimension for the consideration.

Figure 5. Pei-Chen Sun et al.‘s Performance Measurement Quality [40].
4. Research Methodology

4.1. Preliminary Consideration

In this study, the researchers identified the factors that have relevance to the learning environment, which focused on the Information System (IS) related research [9], by defining the relationship between overall satisfaction (OS) with Computer Self-Efficacy, Expectation of Quality, Information Timeliness, Perceived Utility, Software Adequacy, and User Support. It was derived from mapping the relevant theories such as prospect theory [22], assimilation-contrast theory [28,29,32], the theory of adaptation level [43,44], and generalized negativity theory [45,46] into several satisfaction frameworks involving DOI [3], SLOR [31], SSM [36], Thomas’ PMQ [39], and Sun et al. PMQ [40], as can be seen in Table 1, which are based primarily on research objective, description, and domain. Therefore, the theory or the concept can be accepted as a reference as long as it has appeared in the literature, although, at certain aspects or even at the whole picture, the academician might disagree. Thus, the advancement of knowledge in regard to the human factor, especially satisfaction, should consider every possible and potential insight to widen the scope and epicenter to look at the variation in consistency from the natural process and variation in the attribute.

Table 1. Mapping and Formulating the Hypothesis.

| Framework      | Variables                                      | Objectives                                                                 | Description                                                                 | Domain                        |
|----------------|-----------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------|
| Roger’s DOI [3] | Adoption: Observability, Trial-ability, Complexity, Compatibility, Relative Advantage. Innovation: Awareness, Interest, Evaluation, Trail, Adoption. | To describe the pattern and speed with which a new idea, practice, or product spreads through a population. In marketing, this theory is often applied to help understand and promote the adoption of new products. | Factors affecting the rate of diffusion of innovations include the rural-urban mix in the population, people’s education levels, and levels of industrialization and development. Different societies tend to have different rates of adoption as community members accept new innovations. | Expectation to Quality, Computer Self-Efficacy |
| Taeho Yu SOLR [31] | Competencies: Social Comp. w/Instructor and Classmate, Communication and Technical. Outcomes: Learning outcomes, Learner Satisfaction and OL, Student Retention. | To explore the dynamics in online settings and how online learning works, as well the interactions, relationships, perceptions, and roles of students with teachers. | Online learning is stimulated to complete standard education based on strong support network, social skills, persistence, and confidence in their ability with virtual courses or at home. To help students decide if online learning is right for them, several online student readiness tools should be available to help students determine if this method of teaching is right for them and if they have the skills to succeed in this type of learning environment. | Software Adequacy |
### Table 1. Cont.

| Framework | Variables | Objectives | Description | Domain |
|-----------|-----------|------------|-------------|--------|
| Appuhamilage and Torii’s SSM [36] | Satisfaction: Perceived Value, Financial Support, Environment, Service, Internationalization, Facility, (Image → Expectation → Loyalty). | To explore the factors that influence student satisfaction in higher education, as well as their consequences, through the use of value-based and quality-based features. | The consequences of satisfaction in higher education do not linearly coincide with the consequences of satisfaction in other services, because state education services are unfavorable with many special characteristics. While in most services, complaint behavior, word of mouth, loyalty, repeat buying behavior and profits are presented as consequences of satisfaction, some of these consequences are meaningless in higher education. | Information Timeliness, Computer Self-Efficacy, Perceived Utility |
| Sam Thomas’ PMQ [39] | Aspects: Academic, Admin, Infrastructure, Social Life, Support Service. Satisfaction: Loyalty → Recommendation, Repeat, Return. Reputation → Course and University. | To monitor the organization’s effectiveness in achieving self-defined goals or stakeholder requirements by aligning performance in terms of cost, quality, flexibility, value and other dimensions. | Identifying and tracking the progress against organizational goals based on opportunities for improvement by comparing performance against internal and external standards. | Perceived Utility, Software Adequacy |
| Pei-Chen Sun et al.’s PMQ [40] | 1. Learner (Attitude toward Computer, Computer Anxiety, Internet Self Efficacy). 2. Instructor: Response Timeliness, Attitude toward e-Learning. 3. Course: Flexibility, Quality. 4. Technology: Tech. and Internet Quality. 5. Design: Perceived Usefulness and Ease of Use. 6. Environmental: Diversity in Assessment, Learner Perceived with Others. | To assess the different perspective or point of view in measuring the service delivery on the effectiveness of strategies implemented to improve outcomes. | • To ensure that customer requirements are met  • To be able to set reasonable goals and stick to them  • To provide criteria for making comparisons  • To provide visibility and a ‘scoreboard’ for people to monitor their performance  • To highlight quality issues and identify priority areas of concern  • To provide feedback to lead improvement efforts | Information Timeliness, Expectation to Quality |
| Framework                      | Variables                          | Objectives                                                                 | Description                                                                 | Domain                          |
|--------------------------------|------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------|
| Prospect Theory [22]           | Phases: Editing, Evaluation        | To describe how people make decisions when presented with alternatives based on perceived losses or gains. | Given the choice of equal odds, most people prefer to keep the wealth they already have, rather than risk the opportunity to increase their current wealth. People usually dismiss the possibility of losing, so they would rather avoid losses than take risks in order to gain equivalent gains. | Computer Self-Efficacy, Software Adequacy |
| Assimilation-Contrast Theory [28,29,32] | Literacy: awareness, analysis, evaluation and production | To describe on how the planning developed and able to be monitored accordingly and evaluated based on basis of improvement through enhancing the technology and environment. In addition, to identify the constraint, obstacles and hindrances that can limiting the process of implementation in order to exploit them for solution and competitive response based on repetitive evaluation. | Satisfaction is a function of the size of the difference between expected and perceived performance. As the organization reflect on whether the advance organizer was useful, the implication and impact should be integrated and measured accordingly into the course curriculum, aspect of instructors and the capabilities of the infrastructures. The idea allows the standards-related features of the system to be observed through peer observations or to be compared with other similar items differing in shape or status. | Computer Self-Efficacy, Perceived Utility, Software Adequacy, User Support |
| Theory of Adaptation Level [43,44] | Control: coping mechanism, regulator, cognator | Explain that the basis for an individual’s evaluation of a stimulus is based on their past experiences and memories of encounters with similar stimuli in the past. | Indicating that an individual’s judgment of a particular class of stimuli is governed by his or her past experiences and memories of relativity judgments and frame of reference in similar situations. Then, goal-oriented resulted from the pain or even pleasure as both motivated behavior. | Computer Self-Efficacy, Perceived Utility |
Table 1. Cont.

| Framework | Variables | Objectives | Description | Domain |
|-----------|-----------|------------|-------------|--------|
| Generalized Negativity Theory [45,46] | Thoughts: intolerance of uncertainty, risk reduction, bad future assumption | Explain the relationship and reliability of the outcomes based on the input stimuli involving the mindset of thoughts, behaviors and feelings. | Any difference in performance from expectations will upset the individual, and generate negative energy. Then, when expectations are strongly maintained, consumers will respond negatively to any information. Thus, dissatisfaction will occur if the perceived performance is below expectations, or if the perceived performance is above expectations. | Expectation to Quality, Software Adequacy |
| Thoughts: intolerance of uncertainty, risk reduction, bad future assumption | Behaviors: overcompensate, overprepare, over-educate self, lists management | | | |
| | Feelings: anxiety induced, nervousness, tenses, inability to relax | | | |

This study utilized a quantitative type collection method, which was a survey questionnaire through an online approach after the end of the session in the subject information system project management, with a total of selected 100 students with stratified sampling. It split the targeted population into similar subgroups before selecting them into the research sample by relying on the naturally-appearing divisors, which is the information system class. This method helps the researcher to obtain represented number of samples because it is really difficult to have all data from every population due to the ethical consideration. In this case, it has used the Indonesian language to make it easy to deliver the message through 5-Likert scales with a ticking box. For the analysis, this study implemented SmartPLS 3 as a tool to find the fundamental relations and effects between variables through model visualization and path structure [47]. Dijkstra and Schermelleh-Engle [48] proposed consistent PLS as an algorithm intended to produce consistent and asymptotically normal estimates of path loadings and correlations among latent variables for reflectively-modeled construct. Previously, experts have evaluated the arrangement of question statements to revise the word choice to be clearer and simpler compared to before. The questionnaire consists of 45 questions, which were divided into 7 (seven) variables, namely, PU (5), EQ (7), IT (6), US (7), SA (8), CS (6), and OS (6), as follows in Table 2:

Based on the calculation of factor analysis, the variance inflation factor (VIF) has the purpose to measure the level of correlation between one indicator and the other predictors in a model, which is commonly used to diagnose linear or multiple relationships with higher values, that indicate that it is difficult not to accurately evaluate the contribution of predictors to the model. A value of 1 means that the predictor is not correlated with other variables, while values of more than 4 or 5 are sometimes regarded as being moderate to high, with values of 10 or more being regarded as very high [49]. As indicated from the table above, the majority of VIF scores fall above 1, and around 7 indicators have a VIF of more than 2. The preliminary consideration in this study involves the identified gap of theory for the BLS in order to gain a feeling of its properties by examining the relevant theory with significant implications towards respective examples and similar nature. The hypothesis development was conducted through mapping and assembling the information from the model of innovation, readiness, impact, performance, and dimension to establish BLS that have literacy mediated, knowledge dynamic environment, entrepreneurship approach, and user satisfaction system as the characteristics and attributes. Thus, this study presents a precise analysis of the interior properties of the solutions, depending on the regularity of the BLS implementation, and conversely analyzes the communication and interaction within the system as well as its consequences.
Table 2. Variance Inflation Factor (VIF) for Indicators in LM-D.

| Indicators | Statements                                      | VIF |
|------------|-------------------------------------------------|-----|
| PU1        | The module uplifting intellectually              | 1.691 |
| PU2        | Academical pressures as student                  | 1.209 |
| PU3        | Feedback to help on the progress                | 1.583 |
| PU4        | High workload of module                         | 1.276 |
| PU5        | Group development support of competency         | 1.808 |
| EQ1        | Clear expectation for the future goals          | 1.187 |
| EQ2        | Motivation to self-improve                      | 2.261 |
| EQ3        | Achieve best performance                        | 1.736 |
| EQ4        | Critical thinking kind of analysis              | 2.002 |
| EQ5        | Improvement in self-confidence                  | 1.899 |
| EQ6        | Further study with enthusiasm                   | 1.795 |
| EQ7        | Understanding very well the standard            | 1.461 |
| IT1        | Memorization-type of test                       | 1.356 |
| IT2        | Commitment-based as group member                | 1.136 |
| IT3        | Sufficient type for knowing the material        | 1.285 |
| IT4        | Involvement of lecturers to reduce difficulty   | 1.739 |
| IT5        | The content of module has stimulative role      | 1.604 |
| IT6        | The benefit of module for communication skill   | 1.725 |
| US1        | Good explanation from lecturers on module       | 1.584 |
| US2        | The alignment of theory and practical           | 1.406 |
| US3        | Student interest lies upon the lecturers’ skill | 1.503 |
| US4        | Academic goals determine the purpose            | 1.082 |
| US5        | The development of self-independent plan        | 1.321 |
| US6        | The difficulty of the module provided           | 1.124 |
| US7        | Clear objective of the study plan               | 1.448 |
| SA1        | Cognitive skill is extremely critical           | 1.753 |
| SA2        | Lecturers should comment the assignment         | 1.732 |
| SA3        | Complexity in accessing the system              | 1.582 |
| SA4        | Impression towards the features of the system   | 1.943 |
| SA5        | The quality of the module provided              | 1.882 |
| SA6        | The student attendance to the class is compulsory | 1.797 |
| SA7        | Intrinsic value of lecturer is important        | 2.212 |
| SA8        | Examination should be advanced version          | 1.433 |
| CS1        | Self-study can be fulfilled with the video content | 1.678 |
| CS2        | It is necessary to have reference link          | 1.617 |
| CS3        | Quiz is important to assess the understanding   | 2.448 |
| CS4        | The slide should be sophisticated               | 1.754 |
| CS5        | Assignment can improve students’ skill          | 1.762 |
| CS6        | Discussion in the forum help a lot the student  | 1.190 |
| OS1        | Video determine the overall satisfaction        | 1.656 |
| OS2        | Referral source bring huge motivation to study  | 2.128 |
| OS3        | Quiz help me to challenge myself                | 2.408 |
| OS4        | Discussion forum bring me closer to the truth   | 2.007 |
| OS5        | Presentation with slide attract focused attention | 1.850 |
| OS6        | Learning is derived from the assignment         | 1.740 |

4.2. Ethical Consideration

Ethical considerations are a set of principles and values to be followed when managing humanitarian affairs. It aims to ensure that no one acts in a way that is detrimental to society or individuals, which prevents people and organizations from engaging in harmful behavior. Privacy and anonymity for the respondents are extremely important in this study to ensure the credibility and accuracy of the information extracted. Therefore, the voluntary participation of respondents in the research is highly recommended, as the lecturers do not force students to fill out survey questions and do not collect any information that can be directly linked to their identities such as emails, student numbers, or even student names. For the purpose of full control, higher engagement and more experience compared to other kinds of students qualitatively; the information system bachelor program of Telkom
University Bandung, third-year students (6th semester) become the sample of this study, which involves 3 (three) classes respectively.

Other irrelevant demographic data will not be disclosed based on the research objectives, in an attempt to comply with the Personal Data Protection regulations in Indonesia. In addition, participants also have the right to withdraw their answers at any stage if they wish to do so prior to providing information, whose statement was given as informed consent at the beginning of the survey. In short, the principle of informed consent involves the researcher providing the necessary information and assurances about the participation to enable individuals to understand the implications of arriving at an informed, and freely given decision about whether or not to do so, without exerting any pressure or coercion. Meanwhile, this study also ensures that offensive, discriminatory, or other unacceptable language is avoided in formulating survey questions based on feedback from two previous studies that included three experts in developing clarity and instrument testing in the pilots. On the other hand, maintaining the highest level of objectivity in discussion and analysis has also encouraged this research to eliminate research bias. Thus, this study considered multiple possibility through reducing the changes lead to unconscious bias through ensuring research was carried out according to the systematic plan.

5. Result and Discussion

Satisfaction as positive confirmation is known to occur when a product or service is better than expected, which originates from beliefs about the level of performance that certain features provided have been aligned with the likeness and necessity of the user based on the predictive meaning of the expectation concept [17]. In general, Cronbach’s alpha and Tarkkonen’s rho were used to be general estimators of reliability, which is defined as the ratio of the true variance from the total variance within the measurement. It is suggested that a value of more than 0.7 is acceptable, while less than 0.5 is unacceptable. In this study, it shows that two variables, which are PU and US, have Cronbach’s $\alpha$ of 0.305 and 0.598 (poor), respectively, while rho_A shows the opposite direction, with 0.773 for PU as acceptable and 0.669 for US as questionable. Therefore, alternative estimators based on factor analysis have been suggested, which is rho_A to replace Cronbach $\alpha$, which, in some cases, underestimates the reliability and may even give absurd or negative estimates [50]. On the other hand, composite reliability (CR) and average variance extracted (AVE) are necessary to guarantee the validity of the structural model with the general requirement of $\text{AVE} \geq 0.5$ and $\text{CR} \geq 0.7$ [51]. In this case, every variable has a score lower than 0.5 for AVE while PU, SA and US did not meet the requirement for CR, for which the structural model cannot establish the convergent validity to measure the level of correlation of multiple indicators of the same construct that are in agreement [52].

In general, a value of rho_A of 0.7 or greater is preferred to indicate composite reliability, while a rho_A value above 1 is not normal and should not appear in the model. As can be seen in Table 3, all variables are normal (indicated with black color, otherwise with italic red color) while user support has a value lower than the minimum threshold. It is not necessary lower value below the threshold present the bad result, rather than characteristics of the model become more investigated. Meanwhile, there are many highly correlated pairs of variables in the Latent Variables (LVs) such as PU and EQ with 1.028 or US and CS with 1.041. Therefore, there are a total of 8 pairs of variables that have scores greater than 1, which, in this case, occurred due to model specification error, estimation problems, and suppressor effect. The nature of the LVs is intrinsically related to the nature of the pointer variable used to define it. In the most general case, the development of the model structure relates to indicators as effects of latent variables, as in the case of general factor analysis. Using latent variables can reduce the dimensionality of the data, which might indicate the homogeneity of the variable. Several observable variables can be combined or merged into the model to represent the basic concept, making the data easier
to understand, as can be seen in Table 4 (italic red color showed the value below threshold). As a result, the information within the table help to present more comprehensive view of the designed model by taking into account the sample sizes and complexity of the model towards any related issues within the study.

Table 3. Construct Reliability and Validity.

|                           | Cronbach’s Alpha | Rho_A | Composite Reliability | Average Variance |
|---------------------------|------------------|-------|------------------------|------------------|
| Computer Self-Efficacy (CS)| 0.797            | 0.820 | 0.807                  | 0.416            |
| Expectation of Quality (EQ)| 0.807            | 0.828 | 0.809                  | 0.389            |
| Information Timeliness (IT)| 0.742            | 0.773 | 0.752                  | 0.346            |
| Overall Satisfaction (OS)| 0.851            | 0.856 | 0.848                  | 0.483            |
| Perceived Utility (PU)     | 0.305            | 0.773 | 0.412                  | 0.359            |
| Software Adequacy (SA)     | 0.705            | 0.818 | 0.627                  | 0.268            |
| User Support (US)          | 0.598            | 0.669 | 0.546                  | 0.194            |

Table 4. Latent Variable Correlation.

|       | CS   | EQ   | IT   | OS   | PU   | SA   | US   |
|-------|------|------|------|------|------|------|------|
| CS    | 0.815| 0.955| 0.842| 0.691| 0.860| 1.041|      |
| EQ    | 1    | 0.990| 0.645| 0.827| 0.922| 0.952| 1.210|
| IT    | 0.955| 1    | 0.827| 0.922| 0.741| 0.782| 0.847|
| OS    | 0.842| 0.645| 1    | 0.673| 1    | 0.782| 0.963|
| PU    | 0.691| 1.028| 0.922| 0.673| 1    |      |      |
| SA    | 0.860| 0.870| 0.952| 0.741| 0.782|      | 1    |
| US    | 1.041| 1.047| 1.210| 0.751| 0.847| 0.963| 1    |

The indicator reliability shows the percentage of indicator variance explained by the latent variable. Therefore, the reflective indicator should be excluded from the measurement model if the load in the PLS model is less than 0.4. On the other hand, the discriminant validity assessment has the purpose of ensuring that a reflective construct has the strongest relationships with its own indicators in terms of comparison with any other construct in the PLS path model [54,55]. Therefore, some authors suggest the use of heterotrait–monotrait ratio (HTMT) of the correlation besides the Fornell-Larcker criterion due to the lack of reliability to detect the possible indiscriminant among the latent variables [56]. In addition, the exact threshold level of the HTMT is debatable, and some of them suggest 0.85 while the others propose a value of 0.9 [57–63]. From the table, there are 8 variable relationships that should be considered due to the HTMT value under the borderline, which are CS-PU (0.68), CS-SA (0.76), EQ-OS (0.63), EQ-SA (0.75), OS-PU (0.68), OS-SA (0.61), and OS-US (0.67). On the other hand, the saturated model in the model fit refers to all constructs that correlate freely in the structural model, in which the standardized root mean square residual (SRMS) does not exceed a value of 0.08 or 0.10 [64–68] and NFI has a value more than 0.90, while the estimated model is based on a total effect scheme and it takes the model structure into account [60], as can be seen in Table 5.

As can be seen in Table 6, the assessment of d_ULS and d_G must be <95% or <99 bootstrap quantile, in which the exact model fit to test the statistical (bootstrap-based) inference of the discrepancy between the empirical covariance matrix is implied by the composite factor model. Therefore, the value of the d_ULS and d_G in themselves do not pertain to any value. Meanwhile, only the bootstrap result of the exact model fit measures allows for an interpretation of result or the correlation matrix that is so small that it can
be purely attributed to sampling error wherein the discrepancy is non-significant ($p > 0.05$), and thus, model fit has been established [47]. The saturated model pointed out the correlation among every construct within the model while the estimated model have basis toward a total effect scheme and deliver the structure model into account. Therefore, Chi-Square is associated with probability or $p$-value, which should not be statistically significant if there is a good model fit. Meanwhile, NFI also do not provide sufficient information to judge model fit defined as 1 minus Chi-Square value from the null model, which is symbolized by n/a in the table. In addition, the SRMR was below the preliminary suggested threshold of 0.080, indicating an acceptable model fit [57]. This result suggests that the proposed model is well suited for confirming and explaining the development of a BLS that leads to the satisfaction of the student.

**Table 5. HTMT Discriminant Validity.**

|     | CS  | EQ  | IT  | OS  | PU  | SA  | US  |
|-----|-----|-----|-----|-----|-----|-----|-----|
| CS  | 0.81|     |     |     |     |     |     |
| EQ  | 0.99| 0.97|     |     |     |     |     |
| IT  | 0.95|     | 0.63| 0.84|     |     |     |
| OS  | 0.68| 1.00| 0.88| 0.68|     |     |     |
| PU  | 0.76| 0.75| 0.84| 0.61| 0.72|     |     |
| SA  | 0.95| 0.94| 1.12| 0.67| 0.82| 0.97|     |
| US  | 0.95|     |     |     |     |     |     |

**Table 6. Model Fit and Correction Value.**

|                  | Saturated Model | Estimated Model | Correction Value |
|------------------|-----------------|-----------------|------------------|
| SRMR             | 0.10            | 2.29            | CS 2.78          |
| d_ULS            | 11.26           | 5423.20         | EQ 2.95          |
| d_G1             | 6.12            | 21.41           | IT 2.36          |
| d_G2             | 5.84            | 19.09           | OS 3.12          |
| Chi-Square       | 2.230.84        | n/a             | PU 2.02          |
| NFI              | 0.41            | n/a             | SA 2.38          |
|                  |                 |                 | US 1.66          |

As can be seen in Figure 6, the hypothesized path relationship between Computer Self-Efficacy and Overall Satisfaction is statistically significant due to its standardized path coefficient (2.286), which is higher than 0.1 as the threshold. Further, the path coefficient indicated by Expectation of Quality (1.272), Software Adequacy (0.518), and Perceived Utility (0.268), respectively, towards Overall Satisfaction. Meanwhile, it is not statistically significant between Information Timeliness and Overall Satisfaction because the standardized path coefficient (−2.409) is lower than 0.1, as with User Support (−0.786). Thus, it can be concluded that Comp. Self-Efficacy, Expectation of Quality, Software Adequacy, and Perceived Utility are moderately strong predictors of Overall Satisfaction, but both Information Timeliness and User Support do not predict Overall Satisfaction directly. On the other hand, the coefficient of determination, $R^2$, is 0.719 for the Overall Satisfaction endogenous latent variable, which indicated that 6 variables moderately explain 71.9% of the variance in Overall Satisfaction. In this study, the weighting scheme for PLS-SEM use will be factor analysis and path analysis of the structural model with 1000 iterations and 7 stop criteria by using the feature of the initial calculation that all latent variables (LVs) connected to generate more stable LVs scores when running the partial least square (PLS) algorithm [54]. In addition, the interpretation score of PLS is quite likely in principal
component analysis (PCA), which explains the maximum relationship between variables, and these directions will be close together but not identical.

![Figure 6. Consistent PLS Algorithm for Factor Analysis.](image)

Interestingly, based on factor analysis, majority outer loadings of the indicators did not show an acceptable score (total of 36 indicators), which is below 0.7, with some exception such as CS3 (0.806), EQ7 (0.803), IT4 (0.722), OS1 (0.771), OS5 (0.775), OS6 (0.798), PU3 (0.814), SA5 (0.764), and SA7 (0.839). If the borderline score used is 0.5, there are total of 12 (twelve) indicators that can be eliminated for further analysis, which are CS6 (0.443), EQ1 (0.291), IT2 (0.344), PU2 (−0.164), PU4 (−0.435), SA1 (0.430), SA3 (−0.117), SA4 (0.001), SA8 (0.116), US2 (0.109), US4 (0.127), and US6 (0.061). In addition, through bootstrapping to test the significance of each indicator, it showed that only 8 (eight) indicators have a value below 1.96, which are SA3 (0.896), SA4 (0.004), SA7 (0.970), SA8 (0.057), PU2 (1.257), US2 (1.022), US4 (1.138), and US6 (0.491). However, the widespread use of statistical significance as a license to claim scientific results leads to significant distortion in the scientific process, which reduces the value of p to make a significant and insignificant contribution to making the study irreversible [65].

The PLS path modeling method showed that Computer Self-Efficacy has a negative direct effect on Software Adequacy ($\beta = -0.580$) and a positive effect on Expectation Quality ($\beta = 3.320$), which has a greater effect compared to the effect of Overall Satisfaction ($\beta = 2.294$). Meanwhile, Information Timeliness also has a negative direct effect to Perceived Utility ($\beta = -3.052$) that has a greater effect compared to Overall Satisfaction ($\beta = -2.314$). Meanwhile, it also has a positive direct effect on Software Adequacy ($\beta = 1.503$) that is a greater effect compared to User Support ($\beta = 1.210$). There is also a negative direct effect of User Support on Overall Satisfaction ($\beta = -0.740$) and to Expectation of Quality ($\beta = -2.418$). However, the focus of BLS is to balance offline learning while offline learning is either face-to-face learning or traditional online learning, where the learning process is student-centric rather than replacing one method and the others. Actually, BLS pro-
vides students with the flexibility to work on, understand, and learn from a predefined curriculum in a variety of physical environments, depending on pace, speed, and timing. Therefore, it should be conducted to make education a more personalized experience rather than mass production [69,70]. In fact, BLS designers need to develop blended delivery techniques so that each learner can experience the same mixed component experience and offer benefits in terms of flexibility, accessibility, desirability, viability, and feasibility [71].

It can be indicated that each factor of a reflective model is an organized process used to guide analysis and situational improvement. Therefore, it is better to use normal PLS instead of consistent PLS because sometimes the T statistic and some other values are shown as NA (not available), which, in this case, it does not happen, but the result is more stable. In addition, the consistent PLS results are more promising in terms of external loading, $R^2$, and FIT models. In fact, the consistent PLS-SEM (PLSc-SEM) algorithm corrects the correlation of the reflective structures to make the results consistent with the factor model. In principle, the corrections are based on the well-known Nunnally correction of the attenuation formula [46,52]. As can be seen in Figure 7, a path analysis has regressions and covariances between latent variables, while a factor analysis has only covariances with score value that are not quite a distant difference at all. In this study, it can be interpreted that BLS need to prioritize the features in the Computer Self-Efficacy, Expectation of Quality, Software Adequacy, Perceived Utility, User Support, and Information Timeliness from various aspect involving learners, instructors, courses, technology, design, and environment. In this case, software will stop grading when the stopping criterion of the algorithm is reached, or the maximum number of iterations is reached, whichever comes first. Since the study intends to have a fixed estimate, it is necessary for the algorithm to converge before it reaches the maximum number of iterations.

As can be seen in Table 7, the result summary is presented in the form of significance, which is indicated through path coefficients and $R^2$, then validity based on AVE and CR.
While reliability is pointed out by Cronbach Alpha or Rho_A. As a matter of fact, Computer Self-Efficacy can be defined as confidence and competence feelings toward the utilization of computers, which contribute to self-image improvement and emotional measurement. Specific recommended features can be in the form of verbal or text comment persuasion to encourage and reinforce motivation in learning through digital content or even working on quizzes or assignments through LMS platform. It also can be through routine and regular monitoring acknowledgment, such as a student of the month based on the student’s accomplishments in certain criteria, such as earlier time of access, substantive material, or an overall score of assessment. Expectation of Quality is related to the attempt for a high and standardized process through consistent implementation. It might involve certain neglected features that are often put aside from the core objective of the learning process, such as the student profile page, which allows flexible customization for the themes and background. On certain occasions, simple features such as uploading or sharing digital documents with classmates or peers or contacting directly the instructors also fall under this category. Interestingly, making a certain representative object appear, such as previewing a digital document with a snapshot or popup window, pull-down to hide the long text in the explanation, or creating frames, tabs, or favorites to group the specific tasks within the LMS for a certain period of time, can increase the value, which presents comfort in the operation.

Table 7. Hypothesis Results.

| Hypothesis                  | Significancy   | Validity | Reliability |
|-----------------------------|----------------|----------|-------------|
| Comp. Self-Efficacy → Soft. Adequacy | Not Significant | Valid     | Reliable    |
| Comp. Self-Efficacy → Exp. of Quality | Significant    | Valid     | Reliable    |
| Inf. Timeliness → Soft. Adequacy   | Significant    | Valid     | Reliable    |
| Inf. Timeliness → Perc. Utility    | Not Significant | Valid     | Reliable    |
| Inf. Timeliness → User Support    | Significant    | Valid     | Reliable    |
| User Support → Exp. of Quality    | Not Significant | Invalid   | Not Reliable |
| Exp. of Quality → Perc. Utility    | Significant    | Valid     | Reliable    |
| Comp. Self-Efficacy → Ov. Satisfaction | Significant | Valid     | Reliable    |
| Exp. to Quality → Ov. Satisfaction | Significant | Valid     | Reliable    |
| Inf. Timeliness → Ov. Satisfaction | Not Significant | Invalid   | Not Reliable |
| Perc. Utility → Ov. Satisfaction   | Significant    | Invalid   | Not Reliable |
| Soft. Adequacy → Ov. Satisfaction  | Significant    | Invalid   | Reliable    |
| User Support → Ov. Satisfaction    | Not Significant | Invalid   | Not Reliable |

With the transition to advanced digital technology and cross-cultural and interdisciplinary integration, an innovative model should be developed to prepare the graduates for professional activities in a multicultural environment, and the proliferation of continuing education through strategic requirements for a new type of university [72]. When new technologies are introduced and implemented, it is important that they do not affect the safety of education [73–75]. Therefore, the effective use of BLS tools depends on the user’s perspective and knowledge and ability to use computers and mobile phones [76–79]. These key factors have been found to influence the early acceptance of computer technology users and their future behavior regarding the use of web-based learning systems. It can be summarized as the degree of interest, curiosity, interest, optimism, and enthusiasm that students show when they know and are taught as an extension to the stage of motivation to study and grow in education. In the end, the BLS strategy should employ traditional education along with online learning techniques through the optimal utilization of LMS, video broadcasts, desktop video conferencing, and interactive communication tools in order to enhance student participation and knowledge sharing. Of course, it uses valuable
lesson time to develop skills and necessary reflection and create a good attitude toward student learning [80–85].

The notion of adequacy in software is related to the fitness of execution to the primary purposes, which consider an aspect of ease to use in integrating, tracking, or asserting data. The implementation can be in the form of saving as a draft when submitting the assignment in the live menu or a simple and advanced mode of creating the quiz. On the other hand, Perceived Utility features can be associated with pride and ideal concept through supporting the related users in organizing the task and timeline. Lastly, User Support is mutually correlated with the quick response to the feedback, comment, and ticket for certain problems or complaints as well as delivering the notification to the relevant parties with respect to the changes or updates of specific activity in the LMS. Then, the Information Timeliness points out the availability and suitability of utilizing the system function that should be free from mistakes and errors.

Currently, students as viewers show negative perceptions about the duration of the video, the high image resolution, the complex instructions for information related to the lesson implementation, or the tests given by the lecturer, which are often not explained in detail and interfere with the student’s understanding of the material [86]. Providing enrichment for in-service lecturers so that they are competent in teaching students is another important factor related to sustainability issues that is often underestimated [87]. In addition, the terminology used often creates confusion among students and even lecturers, such as distinguishing between asynchronous and synchronous models during the learning process. When pre-service lecturers interact with face-to-face and e-learning materials and have participated in other research or community projects at the university, they have actively built and expanded their personal knowledge. It is based on connecting the analysis to knowledge creation in digitally enhanced communities, leading to improved outcomes in learning. Moreover, it expands access to education, supports lifelong learning, increases system efficiency, adds scalability process, and provides a good return on investment toward LMS [88]. Actually, PLS can generate estimates even for very small sample sizes. However, for other estimates, these estimates are generally less accurate than those obtained with larger samples [89–91]. Therefore, the justification for using PLS-PM with a small sample size should be considered carefully. Despite several factors that might determine the successes of hybrid learning implementation, the role of government cannot be neglected to contribute to establishing stability and sustainability with regulation and to provide merit good by spending most of the budget for the improvement of infrastructure and surveillance for digital literacy [92–94].

6. Conclusions

Digital technology is revolutionizing every part of society, including higher education. Universities are rapidly adapting to the proliferation of mobile devices for staff and students along with digital tools and services on campus and are developing strategies to leverage these technologies to enhance student learning. As the structural model has been formed to measure the satisfaction of users in using BLS, many attempts should be considered to improve the model, namely, the indicator used, the sampling technique, the reflective model, and the respondent’s willingness to answer. In conclusion, the study found that Information Timeliness has a negative effect on Overall Satisfaction, while other variables such as User Support, Perceived Utility, Software Adequacy, Computer Self-Efficacy, and Expectation of Quality have a positive effect on Overall Satisfaction. Contextually, the features that can represent the construct, of course, consider the budget and prioritization in the university. Not only is student learning a process of classroom management, but learning opportunities and time can also be more flexible and independent to allow the ability to continue pre-determined behavior indefinitely.
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