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Relationship between Self–Efficacy and Student Psychology in Blended Learning Courses

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Abstract

Higher education institutions have a growing desire to find new approaches to improving education quality, increasing student participation, and better managing information resources. Educational institutions are adopting blended learning as a result of technological advancements, which have a significant influence on educational outcomes. We're here to talk about how a blended course deployed in a "Management" course at a university improved student satisfaction. In specifically, we are interested in LMS characteristics that influence the LMS's self-efficacy and the effect they have on learner satisfaction. Self-efficacy in the learning management system (LMS) was shown to have a beneficial influence on learners' satisfaction with their education. Additional factors that influence LMS self-efficacy include the system's content, its usability, and its components that promote the development of critical thinking.

Keywords: Learning Management System; Blended learning; higher education; student satisfaction; self-efficacy, psychology

Introduction

As technology improves, greater education is always looking for new ways to provide students with a wider range of selections and a better level of education. As a result of students' increasing reliance on extracurricular activities as a source of information, they have less time to devote to academic pursuits. This has led to the emergence of blended learning as a potential solution to enhance students' learning experience and engagement (Finlay et al., 2022), increase data access (Heilporn et al., 2021), and provide a flexible learning solution As long as they fulfill all of the standards of higher education institutions.

Educators are concerned about learners' participation and active involvement in their classes. As a result, students may become less engaged in learning activities, which may lead to a downward spiral of low morale concerning their academic capacity, which includes lack of motivation, low self-efficacy, and lack of participation that eventually leads to low academic achievement and dissatisfaction (Rasheed et al., 2020). New information and communication technologies (ICTs) provide new ways of creating, disseminating, and obtaining a college education that adhere to standard teaching and learning methodologies, which may help improve the issue (Asarta & Schmidt, 2020). Blended learning, which includes both synchronous and non-synchronous features, is supported by LMS. Self-efficacy of the learner is another key idea in the LMS world of learning management. Individuals with high degrees of self-efficacy are confident in their abilities to carry out specific tasks and get the results they seek, according to Lu and Wang, (2022). Individual self-efficacy affects how individuals interact with one another, how they inspire themselves, and ultimately how they act (Ray et al., 2019). When it comes to blended learning, self-efficacy is described as the capacity of learners to benefit from the technology they are using (Weigold & Weigold,

2021). For example, Weigold & Weigold, (2021) defined self-efficacy in blended learning as personal belief that computers may be used to help them accomplish their goals. This definition is more suited to our study's situation.

When it comes to higher education, traditional methods of learning have often been shown to be ineffective, which discourages students throughout the process of learning. Blended learning would represent a substantial advancement over these methods, which have usually been found to be ineffective (Tabatabaeian & Mashayekh, 2021; Cocquyt et al., 2019). Colleges, on the other hand, seem to be more reluctant to accept new approaches and more conservative in their use of technology (Boelens et al., 2018). On the subject of blended learning, our objective in this research is to examine the effects of self-efficacy on student satisfaction as a means of determining how successful blended learning is at improving students' fulfillment, experience, and involvement in the process of learning. Learners' sense of self-efficacy will be examined in this research by finding LMS-related elements. As a result of increased self-belief, students' motivation, academic achievement, approach and perseverance are all boosted. Students were asked to see whether blended learning had an influence on their overall satisfaction. 300 first- and third-year Bachelor's degree students in Business Administration and Economic Informatics from a pool of 500 students aged 19 to 22.

Literature review

The LMS and blended learning

There is a steady increase in the use of blended learning in educational settings at the university level. According to Boelens et al., (2018), there are a variety of reasons why this strategy is becoming more popular among educators. A mixed learning strategy may also help with other institutional issues, including as expansion, education costs, and adaptability. According to Yao (2019), the following are some of the most significant advantages that blended learning may give: (i) improved simplicity of use and accessibility; (ii) Better instructional design has resulted in better learning outcomes; (iii) reductions in expenditures as a result of a reduction in travel and classroom time. The utilization of technology in education has been linked to a number of advantages. Student-to-faculty and student-to-student conversation can be improved via the utilization of technology, say Shen & Ho (2020), because it allows for greater adaptability and helps to address the shortcomings of geography, time constraints, delivery methods, and communication styles that are inherent in many face-to-face classes.

It is the Learning Management System (LMS) that serves as the backbone of blended learning courses, allowing for seamless integration between face-to-face and online lecture, assessment, and feedback. As Yao (2019) have underlined, instructors must offer structure, interactions, and activities for learners in a blended course in order to concentrate their attention on learning. Learning and teaching may take place at any time and from any location thanks to an LMS, one of its most crucial features. As a result of the utilization of Learning Management Systems (LMS), students are encouraged to take responsibility for their own education, and their efforts are recognized and rewarded (Cocquyt et al., 2019). Students and instructors may engage at the same time (synchronously) or at various times (asynchronously) in order to create an inter-active learning environment (Al Mulhem, 2020). There are other aspects to consider when creating a mixed learning environment, like the personal traits of the instructors and learners, that need to be taken into account.

According to Alamri et al. (2021), integrating blended learning with on-going support and encouragement for students who struggle academically leads to better academic outcomes and less time spent in the classroom. One of Paton et al. (2018)'s main concerns is how to improve student retention via blended learning. Blended learning, according to Nácher et al. (2021), is more motivating for students and results in greater improvements in student learning satisfaction than conventional classroom instruction. This conclusion is supported by other research as well (Asarta & Schmidt, 2020). According to Asarta and Schmidt (2020), blended learning reduced dropout rates and decreased test failures. According to Broadbent et al., (2021) meta-analysis of the efficacy of blended learning,' students in virtual learning settings outperformed their face-to-face counterparts. The clarity of instructions is more

important to students in a conventional environment, while students in mixed classrooms enhance their analytical abilities more than their traditional counterparts (Tabatabaeian & Mashayekh, 2021). It's also important to note that there are significant distinctions in how successful and poor blended learning approaches are used (Bruggeman et al., 2021).

Blended learning techniques are classified by Bruggeman et al. (2021) into three classifications: high, medium, and low impacts blends. This includes modifications to a current teaching plan and overall improvements to the student learning experience. When it comes to low-impact techniques, those that merely include more online activities in conjunction with traditional classroom instruction have been discovered (Bruggeman, et al., 2021). Existing courses might be "swollen," increasing learner effort, or two or more "independent" courses could be created under the same course designation using low-impact blended learning methodologies (Boelens et al., 2018). As a result, according to Boelens et al. (2018), most learners see an additional blended-learning activity as nothing more than an additional burden on top of an already overburdened class or course.

Student satisfaction, self-efficacy, and online technologies

How effectively a learning environment fosters academic performance is defined by Santos et al., (2020) student satisfaction. Student satisfaction with online education is influenced by factors like student motivation, dropout rates, achievement, and devotion to the learning program, says Li (2019) Student satisfaction must be monitored when searching for ways to enhance online or hybrid learning. According to research by Caskurlu et al., (2020), learning pleasure is highly connected to online self-efficacy. An interactive learning setting and feelings of anxiety, according to Al-Fraihat et al. (2020), can influence perceived satisfaction, while perceived self-efficacy and satisfaction may have a favorable effect on the course's perceived utility. Abdous (2019) researched online self-efficacy by dissecting it into many components. Student happiness and self-efficacy are positively correlated with online education. When it comes to defining self-efficacy, Ray et al (2019) used the following: ‘The author wanted to evaluate the degree, generality, and strength of an individual's ability to plan and execute courses of action to achieve predetermined objectives across a range of activities and circumstances.

In addition to influencing the learner's attitude, approach and ability to acquire skills, self-efficacy also impacts the learner's choice of tasks and desire to proceed a course of action (Al-Fraihat et al., 2020). Social cognitive theory says that performance expectation and self-efficacy are two essential cognitive characteristics that influence student behavior, which has the ability to increase achievement and choose the amount of time and effort they will spend on a certain task (Al Mulhem, 2020). "Students' confidence in their ability to complete academic activities" is a better description of self-efficacy than "generic self-efficacy."

Self-efficacy is correlated with increased motivation, increased work effort, and a stronger willingness to take on challenging tasks, all of which lead to an increase in industriousness. Self-efficacy, according to certain theories, has a bearing on academic motivation and performance. In addition to developing the talents and skills necessary to execute course activities, students must build a strong conviction in their ability to do so. Therefore, it seems that the motivating factors of perceived self-efficacy predicts academic success. Particularly in asynchronous learning situations, online education is more student-centered, and learners take more responsibility and autonomy (Li, 2019). The adaptability and difficulty of online learning need those learners achieve stronger self-regulatory abilities, as measured by self-efficacy. Learners must be more active and self-directed while participating in online courses since they must obtain the material on their own and create a learning strategy for themselves.

Study results show that students who have a high degree of digital self-efficacy are more content with a virtual learning setting that allows them to access the internet, explore a wide range of resources accessible, and gain new information. Researchers found that students who have high levels of computer self-efficacy believe online learning is crucial and that their level of self-efficacy increases when the task or difficulty is mediated via computers. Additionally, they decide to learn more and are more interested in the learning process while utilizing online

resources (Gautam et al., 2020). Motivation to study and participate is influenced by students' self-efficacy, which may be enhanced via the use of technology. Self-efficacy in learning may be enhanced in two ways: by receiving positive feedback about the technology used and by improving one's own learning ability (as one sees it) (Hatlevik et al., 2018).

Research Hypotheses

Student satisfaction and self-efficacy are intertwined in this study, which focuses on LMS-related qualities. In our case, the LMS serves as an example of self-efficacy, which refers to students' confidence in their capability to utilize the platform. Al-Fraihat et al. (2020) claim that learner self-efficacy influences students' attitudes, abilities and skills as well as their decisions on what to do next. This suggests that some LMS qualities may have an effect on students' feelings of self-efficacy. The online learning setting model created by Rodrigues et al. (2019) provides a basis for our hypothesized model, however we do not completely consider it. An LMS's performance, self-efficacy, and learner satisfaction are all examined by the authors, who then tie these factors to what they call the "human dimension," or the characteristics of individual students and instructors, and the "design dimension," which refers to the variables that can influence an LMS' quality. It is essential to highlight that the LMS used in this research was created with instructional approach, technical user friendliness, user control, material quality, and interactivity in mind. This study examines just the relationship between LMS self-efficacy and student satisfaction.

Self-efficacy is influenced by four factors in the in a blended learning environment, according to Gautam et al. (2020): (1) prior achievement with online technologies, (2) prior instruction, (3) continual feedback, and (4) fear towards online learning technology. A record of unwavering achievement with a learning management system (LMS) is a significant element influencing learners' self-efficacy, since it combines the confidence, a learner receives from past achievements with favorable feedback from the approach they are utilizing. If learning management system-related tasks are judged to be easy to do, the degree of self-efficacy should be higher. (Cerezo et al., 2019) Learning management systems (LMSs), synchronous and asynchronous forums, wikis, and other similar tools may help students develop their critical thinking skills (Shen & Ho, 2020). One of the most important drivers of self-efficacy in online technologies is improved critical thinking, and we will examine if this holds true for an LMS. The following assumptions are put forward by the conceptual model shown in Figure 1.

H1: The learner's perceived self-efficacy will improve as a result of the platform's content.

H2: The learner's perceived self-efficacy will improve as a result of the platform's accessibility.

H3: The learner's perceived self-efficacy will improve as a result of critical thinking.

The research suggests that a student's sense of self-efficacy is a good indicator of how happy they are with their course experience. Student happiness may be influenced by many types of self-efficacy, according to research (Gautam et al., 2020; Caskurlu et al., 2020; Al-Fraihat et al. 2020). Self-efficacy has been studied extensively, but little attention has been paid to the motivational tools that produce this connection. Students who are confident in their ability to use a learning management system (LMS) are more likely to be satisfied with their educational experience.

H4: The LMS will have a beneficial effect on course satisfaction if students have confidence in their abilities.

Methodology

The research was carried out at a school in the Philippines. The blended learning approach was meant to distribute course material burden evenly between conventional face-to-face learning and newly emerging learning management system-mediated learning. We used this strategy since the research was exploratory in nature and we didn't want to incorporate past learner digital literacy as a factor influencing the blend.

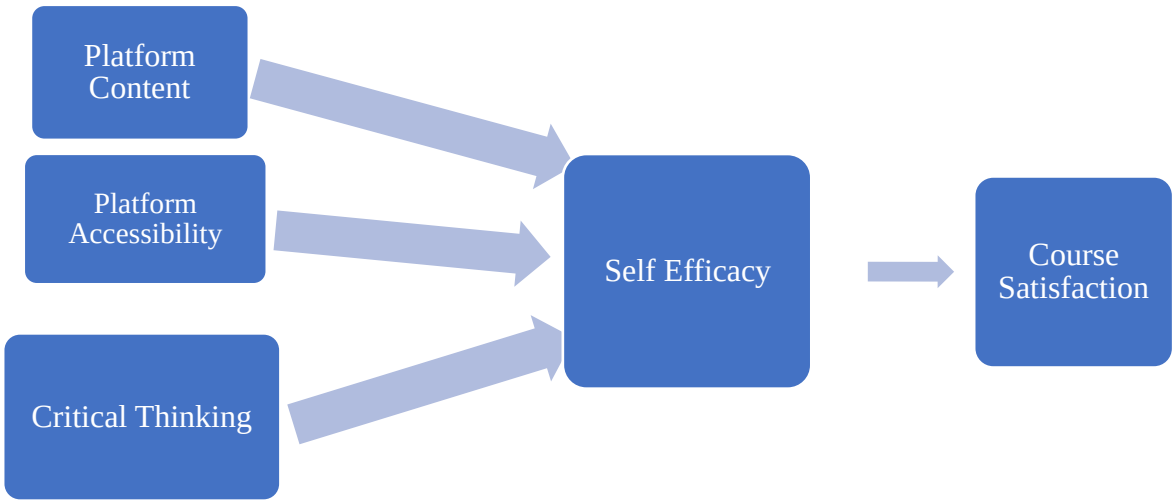

Figure 1. The conceptual model.

It offers a variety of classes in areas such as entrepreneurship, business management, human resources, and innovative thinking. Blended learning was challenging to implement because of the field's slow development, and it was challenging for instructors to find the right combination of lecture, online engagement, and course material. In the course of Business Management, the method was used. Since the class was presented in a flipped classroom manner with online reading, quizzes, modules, and other virtual activities, learners were able to actively participate and join. Peer evaluations and group discussions were among the many types of blended learning activities that were used. Lecturers and students alike had access to all these resources via their instructor, who also gave them face-to-face instruction during class.

A survey was given to all 300 students at the conclusion of the course. The questionnaire gathered information regarding the blended course, the use of an LMS, the students' experiences and perspectives, and some demographic data. Learners were asked whether they had any previous experience with internet-based learning and if so, what kind of experience they had had. Only 30 of the 300 students who participated reported using the internet for educational reasons via the usage of a virtual learning platform, which approximately equates to 8.3% of the sample. Due to the low level of LMS literacy among students, it may be assumed that many post-exposure changes seen in this sample are not due to previous exposure.

According to Li (2019) and Al-Fraihat et al. (2020), the questionnaire was based on their work since this research was primarily focused on learning management system-related variables. On a five-point Likert scale, learners' impressions of their blended classroom experience were evaluated. Five questionnaire constructs were chosen for investigation. Satisfaction with a course is closely tied to students' perceptions of subject-related skill development and knowledge use. Self-efficacy is associated with self-efficacy with the learning management system or learning management system operationalization, which relates to how comfortable they felt utilizing LMS throughout the course. Further about the LMS, three major self-efficacy characteristics were identified: (1) platform accessibility, or how proficient learners were utilizing the internet platform; (2) platform content, or the platform's online classes' usefulness and relevance, and (3) critical thinking, or how much did the learning management system improve their perceptions of critical thinking?

Analysis of structural relationships between latent variables was conducted using the Structural Equation Model (SEM) The structural question is related to correlations and regressions between latent variables and observable variables. Enables one variable to be both a independent and dependent variable at once. SEM has the benefit of

explicitly modeling correlations among latent variables while possibly correcting the "disadvantageous consequences" of measurement errors. Model estimation, evaluation and modification are performed in this method, which is more exploratory than confirmatory. It is possible to assess the SEM framework's factor structure and quality of work metrics using CFA. More correlations between latent variables are possible in SEM than in CFA, thanks to the inclusion of two models: one for measuring and the other for modeling structure. These latent components are represented in CFA by the pattern of observed variables, evaluating their reliability and examining their interrelationships and covariance. Understanding how latent constructs interact with observable variables in the structural model is revealed by investigating the effects of those constructs.

Results

With the use of explanatory factor analysis, we were able to uncover the variables' underlying structure. Internal consistency tests were conducted to examine the relationship between survey items and the postulated latent variable. After controlling for partial responses and other abnormalities, the sample size was lowered from 300 collected surveys to 274 questionnaires. Due to the magnitude of the sample, factor loadings were evaluated. For explanatory reasons, communalities over 0.40 were considered significant, and components with loadings of two or more were omitted from the constructions. Important for interpretation after modifying the constructs were the factor loadings (Table 1). Although all of the components had loadings over 0.4, the fact that several of the loadings remained low, not exceeding 0.5, suggested that the construct was not very robust. However, the cumulative proportion of variation explained by the five components is 60.59 percent, which is an acceptable amount given the sample size of the model.

Construct validity is examined in further detail. Each construct's internal consistency or the strength of the factors that define the latent variable may be assessed using the Cronbach alpha indicator. C. alpha must be more than 0.70 in order to be considered sufficient, while 0.80 is considered exceptional. The number of elements on the scale influences the alpha value, however the effect is lessening as the scale size increases (Singh et al., 2021). In terms of the suggested constructs, Critical Thinking has the lowest C. alpha at 0.72, which is above the acceptable limit. The C. alpha of the other constructs is more than 0.8, showing that the scale's elements are internally consistent. The construct's C. alpha is more than 0.9, which indicates that 'Platform Accessibility' has extremely strong internal consistency. It is clear from these findings that the model's dependability is good, since the constructs have relatively high internal consistency values.

This research also examines the average variance (AVE) and compound reliability (CR) for every latent constructs (Table 1). Models with CR of 0.70 or higher are regarded sufficient, while those with CR of 0.80 or higher show a better degree of internal consistency. Of the constructions, the result of 0.43 for 'Critical Thinking' stands out as the most troublesome. Further evidence for strong internal consistency may be seen in the CR coefficients of other constructs, all of which are greater than or equal to The average variance explained by a latent concept is measured by the AVE. A value of AVE greater than or equal to 0.50 is deemed appropriate. The AVE indicator shows that the 'Critical Thinking' construct has a lower value than other constructions. The model's interpretation of the construct's results should be constrained in light of its low CR and high AVE values. The AVE values of other constructs are all greater than the threshold of 0.50, thus we can infer that the model's constructions account for the majority of its variation.

Table 1. Indicator reliability and validity.

Indicator	**Items for a survey**	**Factor loading**	**AVE**	**C. alpha**	**CR**
Critical Thinking	T1	0.472	0.19	0.71	0.42
	T2	0.451			

	T3	0.413			
Platform Content	C1	0.567	0.61	0.85	0.80
	C2	0.842			
	C3	0.876			
Platform Accessibility	A1	0.819	0.81	0.92	0.92
	A2	0.955			
	A3	0.939			
Course Satisfaction	S1	0.730	0.56	0.84	0.84
	S2	0.920			
	S3	0.831			
	S4	0.734			
	S5	0.402			
Self-Efficacy	E1	0.801	0.64	0.84	0.84
	E2	0.968			
	E3	0.619			

Note: AVE-Average variance extracted; CR- Composite reliability

The CFA and structural models' goodness-of-fit indices are shown in Table 2. After consulting with Munir et al, we examined many important indicators (2018). According to the CFA findings, the model's chi–square is 141.966, with 98 degrees of freedom, and the p–value associated with it is 0.002, meaning it's statistically significant at the five-percent level of confidence. The GFI (goodness–of–fit index) result of 0.954 indicates an overall outstanding match in the investigation of absolute fit. If the RMSEA of the CFA model is less than 0.80, it is considered adequate; if it is less than 0.05, it is considered good. The SRMR is 0.043, much below the 0.05 threshold. The NFI and CFI both exceed the limit of 0.95, indicating a very good fit, while all of the incremental fit indices are over the necessary level of 0.90. Additionally, these incremental fit indices show that the model fit is great in this specific instance.

As mentioned before in connection to the CFA model, these linkages reflect a robust basis. Due to their near approach to 0 (or significance at the 5 percent level), the model's overall chi-square (with 103 degrees of freedom) and p-value indicate a satisfactory overall fit with the structural model. RSEA is 0.39, which is far below the 0.50 threshold for a good match, however GFI is 0.95, which is over the threshold for a good fit. Even though the SRMR is much higher than the CFA model, it remains below the 0.50 threshold. Even incremental fit indices validate the structural model's high degree of realism in modeling the actual environment. The CFA and structural model findings demonstrate a remarkable degree of congruence.

Table 2. structural model and CFA goodness-of-fit statistics.

Goodness – of – Fit Statistics	**Structural Model**	**CFA Model**
Chi – square ($\chi 2$)		
DF	103	98
Chi – square	156.065 (p = 0.00)	141.966 (p = 0.002)
Absolute Fit Measures		
(RMSEA)	0.040	0.038
(GFI)	0.949	0.955
(SRMR)	0.049	0.043

(RMR)	0.055	0.049
(NFI)	0.956	0.960
Incremental Fit Indices		
(RFI)	0.942	0.944
(CFI)	0.984	0.986

Note: RMSEA- Root mean square error of approximation; DF- Degrees of freedom; GFI- Goodness–of–fit index; RMR- Root mean square residual; SRMR- Standardized root mean residual; NFI- Normed fit index; RFI- Relative fit index; CFI- Comparative fit index

Shown in Table 3 are the most significant findings. All four hypotheses are statistically significant at the 5% level and may be considered as valid. Self-efficacy is favorably impacted by content, platform accessibility, and critical thinking in general, therefore supporting the first three hypotheses of this study. Platform content has a greater influence on self-efficacy than platform accessibility or critical thinking. Platform content has an estimate of 0.015 more than critical thinking; this difference is negligible in the context of critical thinking. At 0.1, the disparity between platform accessibility and accessibility is much greater. In light of previous research, we anticipated a smaller gap between the estimations of platform accessibility and content. We believe that accessibility of the platform will have a greater impact on students' self-efficacy.

Self-efficacy elements were examined in the fourth hypothesis. According to the research, self-efficacy is a strong predictor of course satisfaction. This theory is supported by the fact that self-efficacy has a considerable impact on model course satisfaction. According to this assertion, self-efficacy has a substantial correlation with self-efficacy with an estimated value of 0.842. By giving instruction on how to utilize online courses and creating a user-friendly, creative, and fascinating context, one way to boost student happiness is to give mechanisms that foster self-efficacy. If we want to improve student happiness in our blended learning scenario, we need to give priority to LMS self-efficacy tools and online self-efficacy tools in overall.

Table 3. The structural model's estimated coefficients.

	Estimate	**S.E.**	**C.R.**	**p**
Self-efficacy → CS	0.842	0.087	9.576	0.002
Platform Accessibility → SE	0.318	0.043	7.638	***
Platform Content → SE	0.418	0.070	5.840	***
Critical Thinking → SE	0.401	0.127	3.149	***

Note; SE- Self-efficacy; CS- Course Satisfaction

Conclusions

Specifically, we're interested in how a newly established blended learning course's platform self-efficacy affects student happiness. According to the study's results, student happiness in a blended course is favorably related with self-efficacy gained via the LMS. Increasing students' self-efficacy with the learning management system (or technical self-efficacy) may increase their overall happiness with a blended learning course. Since student satisfaction has been proven to be a major predictor of effectiveness in blended learning, this might indicate that student self-efficacy is one of the variables that affect the success of a blended learning class (Lu & Wang, 2022). The three LMS qualities that may impact self-efficacy are platform accessibility, content, and traits linked to critical thinking improvement. This study demonstrates that students' critical thinking skills have improved as a result of teachers' use of open-ended and closed-ended online quizzes, assignments, and case studies. System (platform) quality seems to have a significant role on LMS self-efficacy, since all three constructs exhibit a positive correlation. Learners will be happier and the course will be more successful if the platform is improved because of the link between self-efficacy and learner satisfaction. The research's practical implications include that blended learning

may boost student turnout, motivation, and attentiveness, and that it has the potential to provide superior results because of its greater efficacy.

The design and implementation of a user-friendly and successful learning management system requires a number of phases. Our findings and the literature we read show that attempting to implement blended learning by cramming learners' schedules full of face-to-face lectures and assignments is not a good idea since it may create confusion, information overload, and duplication of classes and assignments. If you're designing a learning management system (LMS), we propose that you focus on pedagogical requirements rather than just including technology. If a blended learning approach and LMS-based systems are introduced to the classroom merely to introduce digital technology to higher education institutions, it will just add to the course load and be ineffective. In order for this effort to be a success, it has to be supported by both the institution and the students themselves. However, learning management system are a new digital tool for learners, and it is now impossible to determine if the course itself enhances students' LMS-specific self-efficacy or whether it was generated by the students on their own. Because most learners had never used an LMS before, it is reasonable to assume that their self-efficacy increased as a result of their exposure to the system and the lack of training they had received.

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