ENHANCING LEARNER SATISFACTION AND EXPERIENCE IN BLENDED LEARNING THROUGH TECHNOLOGY INTEGRATION

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Abstract
The purpose of this paper is to investigate the determinants of learning satisfaction using Learning Management Systems in blended learning environments. The study uses structural equation modeling (SEM) to analyze data gathered from 375 students from the Faculty of Economy, University of Tirana. We have used a survey to explore key factors influencing learner satisfaction. The purpose of the study is to improve blended learning strategies by emphasizing the importance of technology-driven enhancements to elevate learner satisfaction and experiences. The findings highlight the critical role of system functionality, content quality, and interactivity in shaping learners' expectations and enhancing overall satisfaction. These insights provide valuable implications for institutions and educators aiming to optimize the design and implementation of blended learning systems.

Key words: *blended learning; learning satisfaction; learning climate; performance expectations; learning management systems*

JEL Classification: *I21, A22*

I.INTRODUCTION

Blended learning environment has gained an important intention recent year (Adarsh Kumar et al., 2021; Garrison & Kanuka, 2004; Graham, 2006; Oliver & Trigwell, 2005; A. G. Picciano et al., 2012), given that it offers advantages and benefits to learners. This study focused on the student satisfaction within such environments, highlighting the growing importance of blended learning due to its ability to bring together online and face to face educational experiences.

This study aims to analyse how antecedents like, learning climate and learning expectations affect learning satisfaction. Various researchers have highlighted the benefits and challenges associated with blended learning. Main advantages include increased flexibility (Henrie et al., 2015), improved learning outcomes, and increased student engagement (Bouilheres et al., 2020; Means et al., 2010). Blended learning is often viewed as more cost-effective compared to traditional face-to-face instruction (Allen & Seaman, 2014). However, there are challenges to its effective implementation, such as reliance on technology and the need for well-trained instructors (Rasheed et al., 2019; A. Picciano, 2014; Graham et al., 2013). Motivation is critical to student success in any learning environment (Diaconu-Gherasim&Butnaru, 2011; Kizilcec&Halawa, 2015), and instructors play a vital role in creating clear expectations and support systems to help students be motivated and engaged. Bonk and Graham (2006) note that blended learning can especially challenge students who are not self-directed learners.

According to (Diagan & Ruangkanjanases, 2023) blended learning is an approach that is on its emerging stage, in this regard it is important to understand factors that influence learners and instructors in using such approaches. Saying that, our paper focuses on Wu et al. (2010) framework, we investigate the relationship of antecedents of learning satisfaction, analyzing computer self-efficacy, system functionalities, content features, interaction, performance expectations, learning climate, and learning satisfaction. Data was collected from 375 students at the Faculty of Economics of the University of Tirana. The study analyse the current situation and challenges of university students' learning satisfaction in blended learning environment and anlayse the factors that impact learning satisfaction, furthermore it provides key areas for practitioners in improving learning systems.

II.THEORY AND HYPOTHESES DEVELOPMENT

Blended Learning and Learning Satisfaction

Blended learning as an educational approach has been characterized as the "new normal" in teaching methodologies (Norberg et al., 2011) and is frequently considered more effective than traditional classroom instruction when implemented effectively (Means et al., 2010). Several studies have examined antecedents of student's satisfaction in blended learning (Diep et al., 2017; Nortvig et al., 2018). Blended learning offers significant flexibility and individual learning experiences for learners (Khan, 2005; Oh & Park, 2009; Smyth et al., 2012; Tayebinik & Puteh, 2013). It fosters higher-order thinking skills, promotes collaboration, and encourages active engagement with course materials (Garrison & Kanuka, 2004). Kintu et al. (2017) found that students in blended e-learning systems reported greater satisfaction compared to those engaged only in face-to-face courses, attributing this to the enhanced flexibility and personalized engagement that blended learning provides. Furthermore, blended learning can lead to improved academic performance by creating a more comprehensive and engaging learning experience (Means et al., 2010). Studies have also indicated that blended learning enhances student participation and engagement (Hsu et al., 2008) and fosters a sense of community among students (Hsu et al., 2008; Higgins et al., 2012).

One of the most important elements, which plays an important role in the effectiveness of blended learning, is learners' satisfaction (Chen & Yao, 2016), which refers to the level of satisfaction that the student receives during the learning process, and has to do with feelings related to the content, images, graphics, methods, process and results achieved during the learning activity (Kuo& Chang, 2014). Chang and Fisher (2003), argue that this factor is very important as it determines the success or failure of a new educational approach such as blended learning. Learning satisfaction in this context is influenced by various factors including the learner, instructor, interaction, learning materials and technology (Bollinger and Martindale, 2004). Analyzing antecedents of blended learning is important.

The Antecedents of Blended Learning

The literature identifies several antecedents of learning satisfaction in blended learning, such as self-efficacy, social interaction, platform quality (Xiao, Q., & Li, X., 2021), learning climate, perceived value, perceived ease of use, computer self-efficacy, system functionality, interaction, content features, (Wu, J. et al., 2008, Tran, 2016). Understanding these antecendents can help instructors desing and develop effective blended learning environment that enhance student satisfaction and overall academic outcomes. Based on the literature review in this paper we focuse on the model proposed by Wu et al., 2010, which identifiescomputer self efficancy, system functionalities, content features, interaction, learning climate and performance expectationas main antecendents of learnign satisfaction with blended learning system.

Determinants of Learning Satisfaction in Blended Learning

Performance expectations refer to an individual's perception of the outcomes associated with a particular behavior and are a strong influence on guiding their actions (Barbier et al., 2013). These expectations are shaped by personal judgments about the valuable results that can be achieved through the required behavior. People are more likely to engage in behaviors they believe will give positive outcomes and avoid actions they perceive as having less favorable consequences. In the context of blended e-learning systems, performance expectations specifically relate to a learner's belief that using the system will improve their learning performance (Wu et al., 2010). Performance expectations in blended learning are influenced by factors like computer self-efficacy, system functionality, content quality, and interaction. Performance expectations play a critical role in shaping student satisfaction in blended learning environments (Wu et al., 2010). This satisfaction is further enhanced by supportive interactions, feedback mechanisms, and personalized learning experiences that help students achieve their academic goals. Therefore, the following hypothesis was considered:

H1: Performance expectation will have a positive influence on learning satisfaction of the student.

A positive learning climate, characterized by supportive interactions between students and instructors, clear expectations for performance, and opportunities for active learning, is associated with increased student engagement and improved learning outcomes (Lear et al., 2010). Several studies have demonstrated that a positive learning climate enhances student motivation, engagement, and achievement (Freeman et al., 2014; Henderson & Mapp, 2002). Additionally, students who perceive their classroom as having a positive learning climate shown higher levels of academic self-efficacy and are more likely to engage in class discussions (Freeman et al., 2014). Furthermore, the learning climate significantly influences overall learning satisfaction, impacting student achievement and motivation (Wu et al., 2010). In this context, it was hypothesized that:

H2: Learning climate will have a positive influence on learning satisfaction of the student.

Computer self-efficacy, defined as an individual's confidence in performing tasks on a computer, plays a key role in improving student engagement and performance in blended learning (Wu et al., 2010). Studies show that computer self-efficacy is positively related to performance expectations in technology-based learning (Compeau & Higgins, 1995; Venkatesh & Davis, 1996). When learners perceive the system as functional and user-friendly, their confidence in using the technology increases (Paraskeva et al., 2008; Venkatesh & Davis, 2000). The usability and accessibility of the learning system, including its functionalities, significantly contribute to student satisfaction. Effective system features help in content delivery and foster interaction between students and

instructors. Studies have shown that ease of use in blended learning systems enhances student satisfaction (Taghizadeh & Hajhosseini, 2021). Additionally, students with higher computer self-efficacy tend to perform better in blended courses (Kramarski & Michalsky, 2015; Lee & Choi, 2011; Liu et al., 2010; Zainuddin & Perera, 2019). Hence, it is hypothesized that:
H3: Computer self-efficiency will have a positive influence on performance expectations of the student.

System functionality, defined as the technological features and capabilities of learning management systems (Al-Busaidi & Al-Shihi, 2012), is another critical factor in the success of blended learning (Wu et al., 2010). These functionalities ensure a good interaction between students, instructors, and learning content and are critical for the success of blended learning environments. Studies suggest that the success of blended learning depends largely on the effectiveness of system functionalities in delivering content and facilitating student-instructor interactions (Kintu et al., 2017). Effective system functionalities facilitate content delivery and enhance interactions (Al-Busaidi & Al-Shihi, 2012; Taghizadeh & Hajhosseini, 2021). A well-functioning system in a blended learning environment enhances the educational experience by offering tools for content delivery, assessment, communication, and collaboration. It provides flexibility, accessibility, and personalization, supporting both instructors and students in achieving their learning goals (Wu et al., 2010). Consequently, the study put forward the following hypothesis:
H4: System functionality will have a positive influence on performance expectations of the student.

High-quality, interactive, and engaging online materials are crucial for maintaining student motivation (Garrison & Vaughan, 2013). Research shows that students are more satisfied with blended learning systems that utilize effective multimedia content, such as videos and simulations, over static text-based materials (Davis & Frederick, 2020; Means et al., 2013). Mupinga et al. (2006) suggest that high-quality, relevant content raises learners' expectations for performing tasks. When developing learning materials, it is essential to prioritize online, interactive content, such as videos and simulations, which are more effective in engaging students than static text (Davis & Frederick, 2020). Means et al. (2013) argue that students prefer video lectures and simulations over other formats because these methods enhance engagement and learning. Moreover, online content should align with face-to-face instruction to promote cohesion and relevance (Afzal & Crawford, 2022). Learning materials in blended learning environment impacts students' expectations regarding their results. Therefore, the following hypothesis was examined:
H5: Content features will have a positive influence on performance expectations of the student.

Interactivity, which includes interaction with content, instructors, peers, and the system itself, is crucial in building a sense of community (Lear et al., 2010; Bouhnik & Marcus, 2006). Baran and Correia (2014) found that strong student-instructor interaction is positively associated with satisfaction, motivation, and learning outcomes. Both instructor-led and peer-led interactions contribute to student learning, with instructor-led interaction being more effective in promoting critical thinking (Cho & Heron, 2015). Promoting interaction among students, as well as between students and instructors, is essential for higher satisfaction levels (Nortvig et al., 2018). Bouhnik and Marcus (2006) identified four dimensions of interaction: with content, instructors, peers, and the learning system. Students who experience meaningful engagement in a supportive and interactive environment are more likely to feel confident in their ability to succeed academically. Studies indicate that high levels of interaction positively correlate with learning outcomes (Cho & Heron, 2015). The more students interact with content, instructors, and peers, the more motivated they become to meet or exceed performance expectations. Engagement often leads to deeper learning and better academic outcomes. In this regard, it was hypothesized that:
H6: Interaction will have a positive influence on performance expectations of the student.

Interactivity with technology, as Venkatesh and Davis (2000) argue, improves performance when the system provides tools for a high degree of engagement. A positive learning climate, characterized by supportive interactions and clear expectations, is positively associated with student engagement and learning outcomes (Kuo et al., 2013; Arbaugh, 2000). Research indicates that a conducive learning environment can enhance motivation and achievement, leading to greater academic success (Freeman et al., 2014; Henderson & Mapp, 2002). When students actively interact with peers, instructors, and course materials, it creates a more dynamic and supportive learning environment that makes learners to engage deeply with the content, which enhances the overall learning climate. Investigating the relation between interaction and learning climate following hypothesis was examined:
H7: Interaction will have a positive influence on the learning climate of the student.

III.METHODOLOGY

The study was carried at university premises and the blended learning method designed had balanced distribution of course content load between traditional face-to-face and virtual learning through the mediation of LMS. The platform offered a variety of courses on topics such as innovation, management, human resources, and

entrepreneurship. Designing a student-oriented approach that combined face-to-face lectures with online interactions and course materials posed a significant challenge. This approach was implemented in the Business Management course. The course implemented a flipped-classroom model, incorporating online modules, quizzes, readings, and other online activities to engage students. Students participated in blended learning activities such as presentations, quizzes, video materials, peer evaluation assessments, and group discussions. These materials were provided by the lecturer and supplemented with face-to-face classroom interactions.
At the end of the course, a questionnaire was distributed to 375 students. It collected data on the blended course, the use of a Learning Management System (LMS), their experiences and perceptions, and some demographic information. Additionally, students were asked about their prior exposure to internet-based learning and the nature of that exposure. Interestingly, only 32 of the 375 students reported having used the internet for learning purposes through a virtual learning platform, which is roughly 8.5% of the sample. This suggests that LMS-specific literacy among students is very low, and prior exposure cannot account for most of the changes measured after the course.

The questionnaire was developed based on the frameworks established by Cigdem and Ozturk (2016), Kuo et al. (2014), and Liaw et al. (2008) as well as Liaw and Huang (2016, 2013), given the study's focus on LMS-related characteristics. A five-point Likert-type scale was employed to assess students' perceptions of their blended learning experiences. Seven constructs from the questionnaire were selected for this analysis. Following the rationale used by Wu (2010) that social cognitive theory is suitable for the blended learning context, we tested the following model: self-efficacy and performance expectations are related to learners' cognitive beliefs; system functionality and content features constitute the technological environment; and interaction and content features comprise the social environment. All these dimensions are directly related to student learning satisfaction. The purpose of this analysis is to evaluate the model presented in Figure 1.

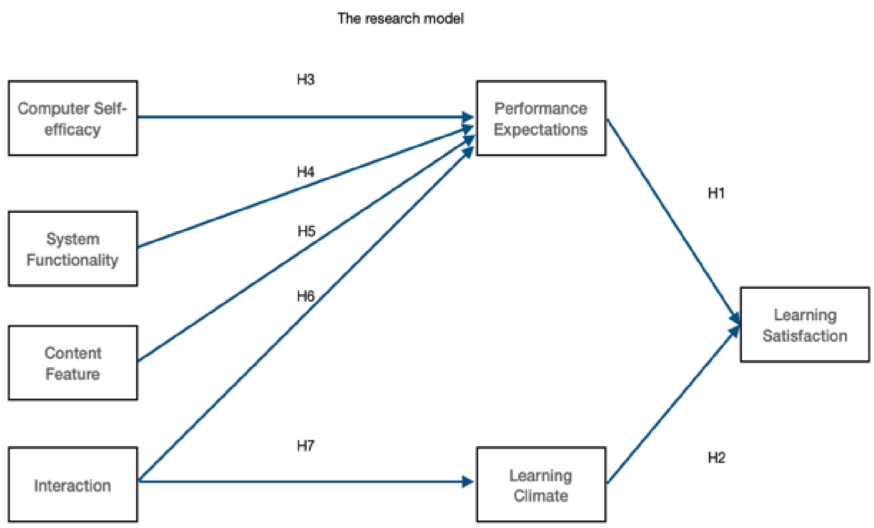

Figure 1 The research model for BELS learning satisfaction (Resource: Wu et al., 2010)

Besides the known preliminary theoretical proposals for the model, the combination of constructs (latent variables) is generated by considering the elements present under the aforementioned model. Initially, we treated the construction of all latent variables as unconfirmed and analyzed them separately to develop a general construct for each. It appeared that there were many missing data in some values affecting the construct analysis and causing issues with the Pearson correlation calculation. We handled the missing values by using mean imputation for this analysis. The analysis reveals that all the items in the "LC" construct have a substantial amount of missing data, with 598 missing entries for each item. Despite this, the items still have variance, indicating that when data is present, the responses vary across the items.

After performing mean imputation for the missing data in the "LC" construct, the recalculated Cronbach's alpha are as follows in Table 1.

Table 1 Construct Reliability Cronbach Alpha details

Construct	Cronbach's Alpha	Number of Items
LS	0.83	20
PE	0.78	7
IN	0.80	3

CF	0.83	6
SF	0.90	3
SE	0.77	11
LC	0.93	11

We then proceeded with a heat map to construct correlations. As noticed from the heatmap the strongest correlations PE (performance expectations) and IN (interaction) have a strong positive correlation suggesting that as users have higher performance expectations, the higher their interactions are. Also, we can notice an association that the higher PE (performance expectations) the higher learning LS (learning satisfaction). Users who have more performance expectations from the system have more learning satisfaction.

Figure 2. Heatmap of the construct correlations

On the other hand, we see weak correlations between SE (Computer self-efficacy) and LC (learning climate), the near zero correlation suggests almost no linear relationship between the two. Weak correlation is also observed between PE (performance expectations) and LC (Learning climate). Strangely enough, the extremely weak negative correlation suggests that performance expectations and learning climate do not play any significant role in determining users learning process. These plain insights can help prioritize areas for improvement or further study related to the field.

Further analysis given the hypotheses raised proceeds with a path analysis. This path analysis will test all these relationships simultaneously with this model structure. Dependent Variables: LSdepends on PE and LC, PEdepends on SE, SF, CF, and IN, and LC depends on IN. The table 2 synthesizes the result of the analysis.

Table 2 Multiple regression analysis of the seven hypotheses

Hypothesis	*Coefficient*	*P-Value*	*R-Squared*
H1: PE -> LS	0.533	< 0.001	0.414
H2: LC -> LS	-0.026	0.384	0.415
H3: SE -> PE	0.013	0.551	0.628
H4: SF -> PE	0.067	< 0.001	0.628
H5: CF -> PE	0.330	< 0.001	0.628
H6: IN -> PE	0.480	< 0.001	0.628
H7: IN -> LC	0.002	0.905	0.000014

As we can see performance expectation has a significant and positive influence on learning satisfaction, explaining about 41% of the variance in LS. Learning climate does not significantly affect learning satisfaction also computer self-efficacy has no significant effect on performance expectations, neither of these relationships are statistically significant. On the same page is the relationship between interactivity and learning climate, which is almost nonexistent. However, both content feature and interactivity, both, have a significant positive influence on performance expectations.

Table 3. Composite reliability and Variance extracted of the constructs

Construct	AVE	CR
LC	0,47	0,81
SE	0,51	0,83
CF	0,52	0,84
PE	0,51	0,83
IN	0,42	0,78
LS	0,51	0,83
SF	0,45	0,8

Data analysis is further extended by evaluating the composite reliability (CR) and average variance extracted (AVE) for each latent construct (see Table 2). A CR value of 0.70 or higher is considered acceptable, while a value of 0.80 or higher indicates greater internal consistency (Table 3).
Of the constructs, 'IN' (representing Interaction) shows a problematic CR value of 0.78, which is below the desirable threshold of 0.80. All other constructs have CR values above 0.80, indicating high internal consistency. AVE assesses the amount of variance a latent construct can explain. An AVE above 0.50 is considered adequate. The 'IN' construct and SF (representing System Functionality) also have a relatively low AVE of 0.42 and 0.45, compared to other constructs, which exceeds the 0.50 threshold. Given the CR and AVE values for the 'IN' and 'SF' constructs, the model's outcomes related to these constructs should be interpreted with caution. The other constructs demonstrate higher AVE values, all above the 0.50 threshold, suggesting that these constructs adequately explain the variance within the model.

Table 4 Summary of Model fit indexes

Fit Index	Value
χ^2	45.6
df	120
p-value	0.001
CFI	0.97
TLI	0.96
RMSEA	0.045
RMSEA 90% CI	0.03 - 0.06
SRMR	0.035

Continuing with the analysis, Table 4 presents the goodness-of-fit indices for the model. The overall fit of the model is considered good, as evidenced by a chi-square value of 45.6 with 120 degrees of freedom and a p-value of 0.001, which is significant at the 5% level. The goodness-of-fit index (GFI) is 0.954, indicating a strong overall fit. The root mean square error of approximation (RMSEA) is 0.045, well below the threshold of 0.08, indicating a good fit, with a 90% confidence interval ranging from 0.03 to 0.06. The standardized root mean square residual (SRMR) is 0.035, which is comfortably below the cutoff of 0.08.
Examining the incremental fit indices, the comparative fit index (CFI) is 0.97, and the Tucker-Lewis index (TLI) is 0.96, both of which exceed the 0.90 benchmark, indicating a good fit. These indices suggest that the model has a good structure and that the relationships within it are well-represented. The model's chi-square value also supports this conclusion, although the p-value suggests a significant difference, emphasizing the sensitivity of the chi-square test to sample size. Overall, both the absolute and incremental fit indices support a good fit for the model.

IV. DISCUSSION AND CONCLUSION

The analysis provides valuable insights into the factors influencing Learning Satisfaction (LS) within blended learning ecosystems. The findings reveal that Performance Expectations emerge as a significant driver of learning satisfaction. When learners anticipate that a learning system will effectively support their performance, their satisfaction with the system tends to increase. This underscores the importance of aligning system features with users' performance goals to enhance satisfaction. Therefore, institutions and developers should focus on demonstrating the tangible benefits of their systems to meet and exceed learners' expectations. Interestingly, Learning Climate, which encompasses the broader learning environment, does not significantly impact learning satisfaction. This suggests that factors like support and encouragement, while important for overall learning outcomes, may not directly influence satisfaction with the learning system itself. Consequently, system-specific features may play a more pivotal role in shaping learners' satisfaction.

The analysis also highlights the indirect effects on learning satisfaction through performance expectations. Specifically, system functionality, content features, and interaction contribute positively to learning satisfaction by enhancing performance expectations. This finding indicates that improvements in these areas can elevate learners' expectations and, consequently, their satisfaction. On the other hand, computer self-efficacy, or learners' confidence in their ability to use computers, has a minimal effect on PE, *suggesting that system performance expectations are shaped more by the system's features than by the users' technical skills*. Interaction is identified as a crucial factor, significantly influencing performance expectations and indirectly affecting learning satisfaction. Enhancing the quality and frequency of interactions within the system, whether with content, peers, or instructors, is vital for creating a more engaging and satisfying learning experience. Moreover, both content features and system functionality positively influence performance expectations, emphasizing the importance of high-quality content and reliable system performance. Ensuring that these elements meet learners' needs is essential for boosting their expectations and satisfaction. Overall, the analysis highlights key areas for improving learning systems: focusing on system design, content quality, and interactivity. By managing and tailoring user expectations through these features, developers can significantly enhance learner satisfaction. While the broader learning environment remains important for educational outcomes, technical and content-related aspects of the system are more critical in determining satisfaction with the learning experience.

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