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Blended Learning and Student Satisfaction: The Moderating Effect of Student Performance

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Abstract

Background: Blended learning is a new approach to teaching and learning created by combining traditional classroom learning with an online learning platform. In recent years, blended learning has become an increasingly popular form of e-learning. It is particularly suitable for transitioning from completely traditional forms of learning to online learning. **Objectives:** This paper aims to examine the effect of blended learning on students' performance and satisfaction and showcase whether students' satisfaction with blended learning leads to performance improvement. **Methods/Approach:** A quantitative research design has been utilized for data collection, consisting of a questionnaire administered to a sample of three hundred and nineteen (319) students from bachelor and master study programs at South East European University (SEEU) in N. Macedonia. Data gathered through this questionnaire have been analyzed through structural equation modelling (SEM). **Results:** The results show that blended learning influences students' performance and satisfaction. **Conclusions:** Course management and interaction positively impact students' satisfaction and performance. The interaction has a more significant effect on both satisfaction and performance outcomes from blended learning. The main conclusion is that blended learning contributes to students' satisfaction which eventually leads to students' improved performance.

Keywords: blended learning; learning platform; performance; satisfaction
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Introduction

Blended learning (BL) is a new approach to teaching and learning. As the name implies, it combines traditional classroom learning with an online learning platform. In recent years, blended learning has become an increasingly popular form of e-learning, and it is particularly suitable for transitioning from complete traditional forms of learning to e-learning. Blended learning has been seen as a new promising approach in online education as it combines conventional face-to-face instruction with some forms of online course delivery (Wu et al., 2010). These authors advocate that students' perception of higher education course delivery has changed due to the new trends in instructional delivery modes influenced by information technologies. As claimed by Okaz (2015), nowadays, students seem to prefer online learning rather than traditional face-to-face learning.

The growth of new technological trends has gone in parallel with changes in the learning process and required new skills and training, especially in higher education (Hoic-Bozic et al., 2008). As a result, many universities have transformed the way of teaching and learning and incorporated online teaching in higher education (Qiu, 2019). The use of information technologies in education has received attention from quite many scholars. (Tselios et al., 2011). Since blended learning entails a mix of face-to-face and online learning, it has been identified as an appropriate alternative for distant learning (Diep et al., 2017). Moreover, many studies have investigated the relationship between blended learning and students' satisfaction (Sadeghi et al., 2014; Sajid et al., 2016; Vernadakis et al., 2012; Wu et al., 2010), indicating a high satisfaction rate among students from this type of instruction. However, as Giannousi et al. (2009) pointed out, despite the consensus that high satisfaction leads to greater motivation and thus to more efficient learning, there has been very little evidence about the direct relationship between student satisfaction and high academic performance. According to a study by Wach et al. (2016), the construct of satisfaction from academic courses has not received much attention from psychologists. It has not been thoroughly analyzed and described. As suggested in this study, the very concept of satisfaction can be further divided into subcomponents, including satisfaction from the academic content, study conditions, stress, etc. Following this logic, blended instruction can be considered from multiple perspectives, including course organization, delivery, conditions, etc., which adds to the complexity of the issue concerning student satisfaction. For this reason, there is a gap in the available literature as very little research has been carried out about the relationship between satisfaction and students' overall performance in courses delivered through blended mode.

Therefore, the current study tried to investigate the relationship between blended learning and students' satisfaction on the one hand and the other hand to determine whether students' satisfaction eventually leads to students' performance improvement. For this paper, performance construct is understood as students' evaluation of their academic achievement according to the standard definition of academic performance as "the quantitative result obtained during the learning process, based on the evaluations carried out by the teachers through objective test evaluations" (Garbanzo, 2007 in Noemy et al., 2017, p. 1105).

The paper is organized in the following way: it starts with introducing the subject matter and contains the study objectives. The following part focuses on the literature review, and the methodological approach is explained in the third part. The findings are presented in the result section, while the last section includes the discussion and conclusions.

Literature Review

Satisfaction with blended learning can improve students' performance in certain areas. For that reason, student satisfaction is considered to be an important factor in measuring the quality of teaching and learning in higher education. Evaluating the factors that contribute to students' satisfaction, possibly further leading to enhanced performance is critical for these institutions. Blended learning is thus seen as an essential factor in students' satisfaction.

Technology has been embedded as a central component in many online learning classrooms in learning platforms for participation, video and audio equipment, computers, and Internet access (Yang et al., 2013). This trend has made higher institutions put efforts in developing a mix of course delivery contents. Therefore, blended learning combines different learning environments, and it combines technology and other traditional teaching and learning methods, resulting in synchronous and asynchronous interactions (Hoic-Bozic et al., 2008).

The traditional, ex cathedra teaching was the main and only way of instruction in higher education institutions for a long time. Nonetheless, the rapid development of information technologies has been the reason for preference of other forms of content delivery. In this way, blended learning becomes a new mode of combining traditional, face-to-face and online learning.

Using the Internet for interaction between students and teachers defines the online teaching. Many universities use blended learning and online delivery to cope with the new challenges in higher education (Zeqiri et al., 2020). Blended learning combines online content and traditional face-to-face delivery. (Heirdsfield et al., 2011). In blended learning, there is a mixture of conventional face-to-face classes and online learning that uses the internet and physical presence in classrooms (Friesen, 2012); it is a combination of online and offline learning (Boelens et al., 2015); blended learning puts together face-to-face classroom activities, technology and media (Picciano, 2006); "hybrid teaching" is another term used in blended learning environment (Verkroost et al., 2008). What is more, many authors speak about a combination between face-to-face and online learning components, when defining blended learning (Drysdale et al., 2013; Huang, 2016). Graham (2013) claims that blended learning combines traditional face-to-face and online learning. Course management is facilitated through blended learning as it enables instructors to combine online and face-to-face course components and resources become accessible to students whenever convenient to them. Besides this, it also assists in organizing the grading as it provides opportunities for collecting data in a given platform and thus helps managing the whole learning process (Rahman et al., 2015). Concerning the relationship between the course management and students' performance, we propose the first hypothesis to be:

- H1: *Course management influences students' performance.*

Research has also shown that blended learning focuses on a teacher-centred process to become a more student-centred process. Related to this issue, Fadde et al. (2014) claim that blended learning promotes students' independent work. The learning management systems used by higher educational institutions provide conditions for publishing materials and information for students at their high convenience. The literature also provides evidence that online learning both engages and satisfies students (Fisher et al., 2018). As all this is also related to course management and blended learning, our second hypothesis is:

- H2: *Course management impacts students' satisfaction with blended learning.*

In addition, blended learning contributes to higher students' engagement with course resources and activities (Fadde et al., 2014). A meta-study carried out by Bernard et al.'s (2014) on blended learning in higher education reveals that technology has had an overall positive impact on the learning process. This positive impact might be related to satisfaction, and thus we hypothesize further that:

- *H3: Course management and performance relationship is moderated by student satisfaction*

In an online delivery context, instructors interact with learners providing feedback and exchanging information. Online delivery also facilitates the learner-learner Interaction by discussing issues related to the subjects of the study (Du et al. 2014). Online learning increases the interaction process between instructors and learners (Jain et al., 2011). Many other studies emphasize that blended learning increases teachers' interaction level with students and that eventually leads to their higher satisfaction (Romero-Frías et al., 2013). Interaction presents a critical experience and an essential component for a thriving learning environment (Graham, et., 2005). Previous research also indicates the critical role of interaction in the learning experience. It is therefore treated as highly significant for the success of online courses (Du et al., 2014). We, therefore, contemplate that:

- *H4: Interaction influences students' performance with blended learning.*

Graham (2013) advocates that blended learning provides opportunities for more teacher-student Interaction while learner-to-learner interaction positively affects the online learning process and can also impact student satisfaction (Ekwunife-Orakwue et al., 2014). Based on this, we propose the following hypothesis:

H5: Interaction has an impact on students' satisfaction.

Blended learning enables collaborative activities, and the social presence students perceive during the interaction process. A study carried out by Sorden et al. (2013) shows that blended learning facilitates collaboration and social presence, eventually leading to more effective and satisfactory learning settings. This relationship is examined through our following hypothesis:

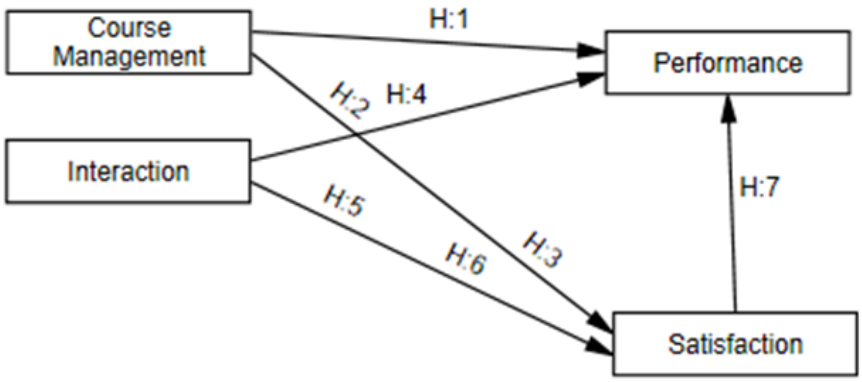
- *H6: The relationship between Interaction and performance is moderated by the satisfaction*

Students seem to be more satisfied when courses combine online and face-to-face instructions. Many studies have investigated the relationship between blended learning and students' satisfaction. For example, the results of a study by Kiviniemi (2014) show that 83% of students prefer blended learning, which has also been shown to improve performance. In their study, Martínez-Caro et al. (2011) notice that students have been more satisfied with courses in blended formats than traditional, face-to-face courses. Vernadakis et al. (2012) also claim that blended learning delivery is preferred over conventional instructional format. Their findings suggest that students' satisfaction with learning increases when instructors combine traditional classrooms with online instructions. Moreover, in researching two higher education institutions, Boyle et al. (2003) reveal marked improvements in students' performance in both institutions and students' positive evaluation of blended learning features. Based on this, we propose the following hypothesis:

- *H7: Satisfaction influences students' performance*

According to the literature review presented above, we propose a conceptual framework that consists of students' performance and satisfaction as dependent variables and course management and Interaction as independent variables. The hypothesized relationship between these variables is depicted in figure 1.

Figure 1
The Conceptual Model



Source: Author's illustration

The findings indicate that the proper combination of online and traditional delivery is an effective methodology in higher education institutions. Blended learning use appears to facilitate this kind of combination of delivery. As proposed by López-Pérez et al. (2011), with the new information technologies, educational institutions are equipped with resources that create new learning environment leading to an improved teaching and learning process.

Research Methodology

Research settings

This study utilized a quantitative research methodology in order to examine students' perceptions of blended learning in higher education. It was conducted at the South-East European University (SEEU) in North Macedonia. The selected university employs Google Classroom (GC), an open-source used as an educational platform for enhancing qualitative blended learning. Four dimensions, each containing their items, were created to develop a research instrument. Thus, the course management dimension (CM) is comprised of 4 items, Interaction (I) of 3 items, Performance (P) of 3 items, and Satisfaction (S) of 3 items. Participation in the survey was voluntary, and students' anonymity was guaranteed. The questionnaire structured in this way was distributed to respondents that had used blended learning in their bachelor or master degree programs. Data were collected from 319 samples by probability sampling technique from January to March 2020.

Research instrument and data collection

A questionnaire survey method was used to collect students' responses. The survey items were developed based on the relevant information from the literature review. The questionnaire was translated into Albanian for better comprehension and more accurate responses. A five-point Likert scale was used (where five denoting strongly agree and 1 = strongly disagree), as shown in more detail in Table1.

Table1
Research instrument description

Construct	Code	item
Course Management (CM)	CM1	The online and face-to-face course components enhance and complement each other.
	CM2	Online learning platforms are favorable for managing and organizing learning
	CM3	Blended learning makes it more convenient for arranging and grading assignments
	CM4	Blended learning makes it more convenient for publishing materials and information
Interaction (I)	I1	Blended learning creates a user-friendly learning environment with teachers
	I2	Blended learning improves the communication and interaction between students and teachers
	I3	The use of blended learning technology encourages me to learn independently
Performance (P)	P1	Blended learning improves my overall performance in courses.
	P2	I think blended learning is the best way of improving students' performance
	P3	I have better grades in classes that combine online and face-to-face instructions
Satisfaction (S)	S1	I feel more satisfied when I study using blended learning
	S2	am more satisfied with this learning experience compared to traditional course settings
	S3	I prefer a combined class with face-to-face and online instructions

Source: Authors' work

The questionnaire provided demographic data of respondents and their attitudes concerning blended learning and their satisfaction. The first part of the questionnaire represents the demographic characteristics of respondents, and the first part combines the demographic profile of participants. The second part has four (4) indicators and has been designed to measure independent variables and the dependent variable. Through the questionnaire, participants have stated their self-perception about blended learning.

Table 2 shows that most respondents belong to the female group with 63.6 % and males with 36.4%. Concerning computer literacy, 24.8% of respondents have excellent skills, 38.2% are perfect, 34.5% are good, 1.9% are poor, and 0.6% have abysmal skills. Concerning respondents' experience with blended learning, 55% have less than one year of experience, 26.7% have 1 to 2 years of experience, 9.4% have 2 to 3 years of experience, whereas 8.8% belong to a respondent group with more than three years of experience. Regarding the respondents' GPA, 7.2% are with 6-7 GPA, 23% with 7-8 GPA, 30.5% belong to 8-9 GPA group, and 29.9% belong to 9-10 GPA group, whereas 9.4% of respondents didn't report their GPA. The majority of respondents, around 54.4%, are in their first academic year, 33.6% in the second year, 5.3% in their third year, and 3.1% in their fourth year of studies, whereas 3.5% of respondents are master students.

Table 2
Respondents Demographic Characteristics

Gender		**Frequency**	**%**
	Male	116	36.4
	Female	203	63.6
Computer literacy		Frequency	%
	Very poor	2	0.6
	Poor	6	1.9
	Good	110	34.5
	Very good	122	38.2
	Excellent	79	24.8
Experience with Blended learning		Frequency	%
	Less than one year	176	55
	1-2	85	26.7
	2-3	30	9.4
	More than 3	28	8.8
Cumulative GPA		Frequency	%
	6-7	23	7.2
	7-8	73	23
	8-9	97	30.5
	9-10	95	29.9
	NA	31	9.4
Academic year		Frequency	%
	First-year	174	54.4
	Second-year	107	33.6
	Third-year	17	5.3
	Fourth-year	10	3.1
	Master	11	3.5

Source: Author's calculations based on survey results

Data analysis

Smart PLS 3 and SPSS 20 software have been used for analyzing the obtained empirical data. The gathered data have been analyzed in several steps. A validity test has been conducted to test whether the items describe the context of the construct (Hernaus et al., 2012). Firstly, a confirmatory factor analysis (CFA) has been conducted to test converged validity and discriminant validity (Hair et al., 2016). Secondly, reliability analysis has been conducted using Cronbach's alpha and composite reliability that indicate the internal reliability of the construct. The proposed threshold of 0.70 or greater reliability coefficient indicates good reliability (Hair et al., 2014). SEM technique has been used to evaluate the measurement model and estimate the structural model.

Results and Discussions

PLS-SEM supports a two-step analysis. The first step assesses the measurement model, and the second step analyses the structural equation model (SEM) (Anderson et al., 1988; Shahid et al., 2021).

Assessment of measurement model

The assessment of the measurement model is performed to show how variables come together to represent the theory based on convergent and discriminant validity (Anthony et al., 2019).

Convergent validity

A good model fit also looks at the convergent validity of items, and this test shows how close the items are to each other. Table 3 reveals that values of composite reliability range from 0.866 to 0.938, which indicates that all values have exceeded the recommended value of 0.70. The Cronbach's alpha values range from 0.715 to 0.931, exceeding the proposed value of 0.70. So, an alpha value of 0.70 -0.8 or greater denotes an excellent level of reliability (Ursachi et al., 2015). The average variance extracted (AVE) values differ from 0.561 to 0.732, all over 0.50, recommended by Fornell et al. (1981).

Table 3
Convergent Validity

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Course management	0.794	0.800	0.866	0.617
Course management* Satisfaction	0.931	1.000	0.938	0.561
Interaction	0.779	0.781	0.872	0.694
Interaction* Satisfaction	0.914	1.000	0.928	0.589
Performance	0.814	0.821	0.891	0.732
Satisfaction	0.715	0.737	0.840	0.638

Source: Author's calculation based on results

Discriminant validity

Discriminant validity is a test that assesses the extent to which the constructs in the model are close to each other or how they differ (Bagozzi et al., 1991). As shown in Table 4, the AVE values exceed the proposed 0.50 loading, indicating that discriminant validity is supported for the construct (Fornell et al., 1981). Besides, the correlation items in any construct should not exceed the square root of the AVE in a single construct (Hair et al., 2010). As shown in Table 5, the discriminant validity testing is supported based on the results.

Table 4
Discriminant validity

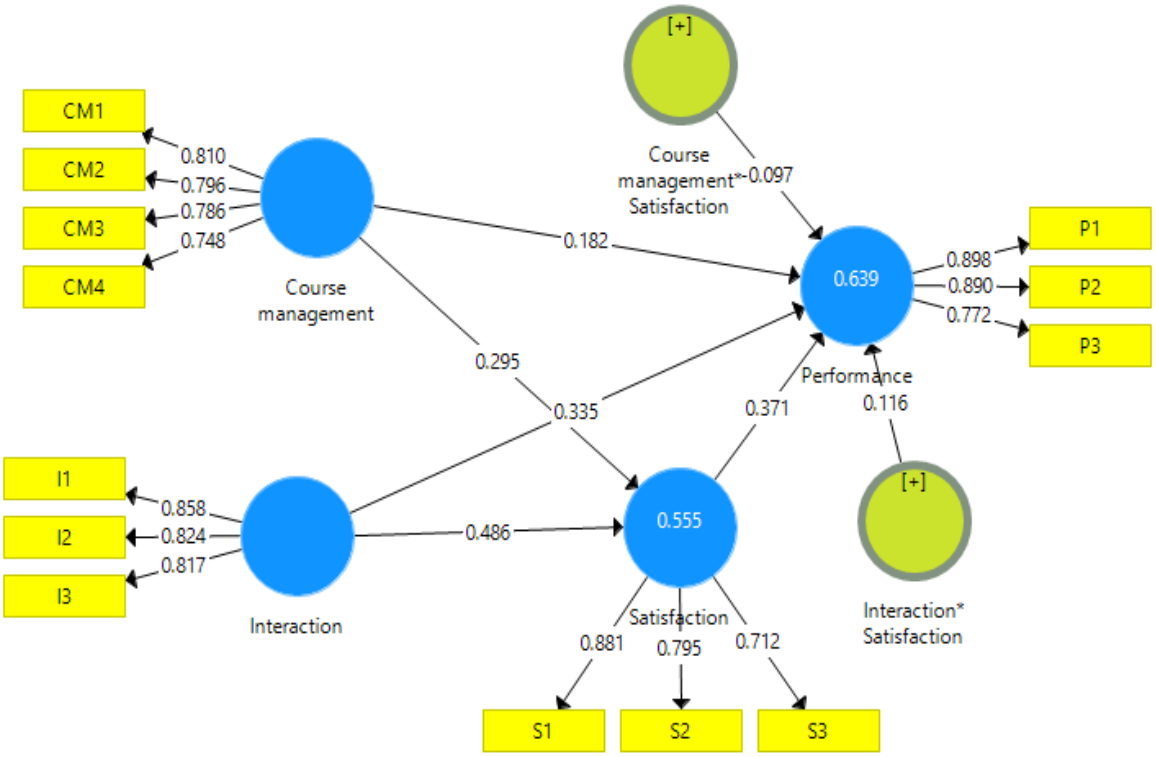
	CM	CM*S	I	I*S	P	S
Course management	0.786					
Course management* Satisfaction	-0.305	0.749				
Interaction	0.807	-0.290	0.833			
Interaction* Satisfaction	-0.302	0.901	-0.344	0.768		
Performance	0.700	-0.275	0.735	-0.266	0.855	
Satisfaction	0.687	-0.360	0.724	-0.361	0.730	0.799

Source: Author's calculation using Smart PLS

Assessment of structural model

This study has utilized the Smart PLS Structural Equation Modelling for evaluating the proposed model. The results of the SEM path analysis are shown in figure 2. The path measurement shows that course management R2 is 0.182, and teacher-student interaction R^2 is 0.334. The course management contributes to 0.295 to satisfaction, whereas, Interaction contributes more with 0.486 to student satisfaction. Finally, the model shows that Satisfaction variance is explained by 55.5 %, whereas Performance is by 64%. Thus, the model has obtained good results.

Figure 2
Structural Equation Modelling



Source: Author's illustration

Table 5 shows factor loading for all items in the construct. As it can be seen, all loadings are more significant than .05., which shows the recommended threshold of average variance extracted (AVE). All item loadings are 0.712 to 0.898; that is over the recommended threshold value of 0.50. The collinearity test is used to test whether the method is biased. According to Kock (2015), the occurrence of a VIF more significant than 3.3 indicates collinearity, and therefore the model construct might be biased. Therefore, if all VIFs from the collinearity test are equal to or lower than 3.3, the model can be considered free of common method bias.

Assessment of model fit

To test the model fit, model fitting parameters have to be tested first: the Standardised Root Mean Square Residuals (SRMR) and the Normed Fit Index (NFI). The SRMR shows the difference between the observed correlations and the model implied correlation matrix whereby values less than 0.8 are considered a good fit (Henseler et al., 2014; Ramayah et al., 2017). The second fit index is NFI which computes the Chi-square value of the proposed model, and values above 0.9 denote an acceptable fit (Ramayah et al., 2017). For this case, the SRMR value is 0.073, which denotes a good fit, and the NFI value is 0.893, which denotes an acceptable fit.

Table 5
Construct items loadings

Construct items	Loadings	Mean	SDEV	T Statistics	VIF
Course Management (CM)					
CM1	0.810	3.82	0.82	38.333	1.625
CM2	0.796	3.83	0.89	31.856	1.638
CM3.	0.786	3.86	0.95	27.74	1.577
CM4.	0.748	4.00	0.81	18.913	1.527
Interaction (I)					
I1.	0.858	3.82	0.86	36.903	1.749
I2.	0.824	3.88	0.92	40.656	1.562
I3.	0.817	3.75	0.90	31.272	1.577
Performance (P)					
P1.	0.898	3.74	0.88	78.257	2.509
P2.	0.890	3.760	0.93	62.617	2.439
P3.	0.772	3.68	0.96	24.969	1.424
Satisfaction (S)					
S1.	0.881	3.89	0.86	57.188	1.779
S2.	0.795	3.73	0.96	31.848	1.428
S.3	0.712	3.89	0.91	17.069	1.369

Source: Author's calculation using SPSS

Testing hypotheses and the moderating effect

A multiple regression analysis with the SEM model has been used to investigate the relationship between course management and Interaction with students' performance and satisfaction. The results show that course management directly affects students' performance and is significantly related to student satisfaction. Table 6 shows that there is a significant relationship between all variables.

The results also show that course management is positively and significantly related to students' performance with path coefficient = 0.182, t = 2.977, p < 0.003, indicating that H:1 is supported. Based on the results, H:2 shows a positive relation between course management and student's satisfaction with path coefficient = 0.295, t = 4.259, p < 0.000, denoting that H:2 is also supported.

Moreover, results from table 5 reveal a significant positive relation between Interaction and satisfaction with path coefficient = 0.335, t = 4.812, p < 0.000, indicating that H:4 is supported. Additionally, results also point out that the Interaction of students with lecturers is highly significantly related to satisfaction with a path coefficient = 0.486, t = 7.164, p < 0.000. Thus, H:5 is supported. Finally, H:7 is also supported because the results reveal a strong relationship between students' satisfaction and performance, path coefficient = 0.371, t = 5.731, p < 0.000.

Finally, the SEM model has investigated the moderating effect of course management and interaction satisfaction on improving students' performance. The moderating variable shows whether it strengthens or weakens the direct effect of exogenous variables on the endogenous variable. Based on the results presented in table 6, we can conclude that satisfaction does not significantly affect course management and student performance. Therefore, based on the results, we can conclude that H:3 and H:6 are rejected, with low T-values of 1.339, respectively 1.705. Hence, If the critical ratios for the difference are smaller than -1.96 to +1.96, we can assume that there is no significant difference between groups.

Table 6
Hypotheses Testing

		Path Coefficient.	STDEV	T-Values	P-Values	Results
H1	Course management -> Performance	0.182	0.061	2.977	0.003	Supported
H2	Course management -> Satisfaction	0.295	0.069	4.259	0.000	Supported
H3	Course management* Satisfaction -> Performance	-0.097	0.065	1.339	0.181	Rejected
H4	Interaction -> Performance	0.335	0.07	4.812	0.000	Supported
H5	Interaction -> Satisfaction	0.486	0.068	7.164	0.000	Supported
H6	Interaction* Satisfaction -> Performance	0.116	0.065	1.705	0.089	Rejected
H7	Satisfaction -> Performance	0.371	0.065	5.731	0.000	Supported

Author's calculations using Smart PLS

Discussion

Higher education institutions have been making many efforts to increase the quality of teaching in their educational premises, which requires analysis of the factors that increase the quality of teaching and learning and factors that contribute to students' satisfaction and performance. Therefore, understanding what method leads to student satisfaction provides an insight into educational institutions to create a more effective learning environment (Wu et al., 2010). Blended learning seemed to be a promising approach in students' satisfaction (Lim et al., 2009) and a preferred instructional form (Melton et al., 2009).

The impact of satisfaction on students' performance improvement has not been thoroughly investigated yet. However, the impact of blended learning on student satisfaction with university online delivery has been studied a lot. Therefore, this study has tried to investigate the impact of blended delivery on students' satisfaction and performance.

The empirical results in this study show that course management seems to contribute to student satisfaction during blended learning. Therefore, the findings from the research support other previous studies that course management in the blended setting is a factor of student satisfaction (Jain et al., 2011; Bernard et al., 2014; Du et al., 2014; Fisher et al., 2018).

In addition, the findings also support the previous finding by other scholars (Graham et al., 2005; Romero-Frías et al., 2013; Du et al., 2014; Ekwunife-Orakwue et al., 2014) that student interaction during blended learning contributes to student satisfaction. Moreover, the findings also support the previous finding by other scholars (Wu et al., 2010; Vernadakis et al., 2012; Graham, 2013; Sadeghi et al., 2014; Sajid et al., 2016) that student satisfaction contributes to student performance improvement.

Finally, the study has investigated whether there is an interaction or a moderating effect of satisfaction on performance improvement. The results demonstrate that satisfaction does not increase the effect of course management and Interaction on students' performance. Finally, the study results support only five study hypotheses and reject two of them.

Conclusions

Summary

Blended learning has been seen as a new promising approach in online education as it combines the traditional way of teaching with some new forms of online learning. Blended learning facilitates course management, and it provides opportunities for students and teachers to interact during the learning process. In addition, blended learning makes it easier to publish resources organize independent work by students, and manage and organize courses, which eventually leads to students' satisfaction with blended learning and their outcome improvement. Therefore, the main conclusion is that blended learning improves students' satisfaction and performance.

Practical implications

This research provides some practical implications for higher educational institutions concerning the impact of BL on students' satisfaction and performance. The findings also suggest that providing students with blended learning contributes to students' satisfaction and performance improvement. Moreover, the results suggest that instructors should manage their courses according to students' expectations. In addition, the research has shed some light on some of the essential factors that students prefer in their learning. BL helps students organize their pace of work, organize their materials, and share information with their peers and instructors. Finally, other higher institutions can use the findings from this research to promote blended learning as a combination of face-to-face and online delivery to increase students' satisfaction.

Theoretical implications

This research also provides some theoretical implications to instructors and higher education management by offering crucial insights on using blended learning to achieve students' satisfaction with this online delivery and reach better results in the learning process. Moreover, the findings also contribute to the existing literature on BL learning in developing countries by providing information about its effectiveness.

Furthermore, the dimensions mentioned in the literature review and this study significantly impact students' learning through BL. Thus, the findings denote the instructor's role in managing the course content, Interaction, and inter-communication through these online formats to create a better and more positive learning environment.

Our findings confirm that learners' satisfaction is based on course management (combining online and face-to-face course components to enhance and complement each other) and Interaction (creating a user-friendly learning environment that contributes to improved communication and interaction between students and teachers).

Limitations and future research directions

The study's main limitation is that the perceptions about blended learning have been considered only from the students' perspective. Multi-group analyses considering the two-sided approach of both teacher and student perspectives could have produced better-correlated results.

It is recommended that more factors that could lead to student satisfaction and student performance improvement are analyzed. Future research can focus on the

new trends in information technologies and on ways to assess the adoption process of students and teachers, considering that the number of these new trends in information communication technologies is constantly increasing. Moreover, future research should be expanded to explore the relationship between student and instructor satisfaction. Finally, gender as a moderating factor can also be included in future research to find out more about the differences regarding technology adoption in a learning environment.

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