

Effectiveness of Blended Learning Environments in University Students Pursuing Undergraduate Education in Sports Sciences

Özgür AYDIN [1], Talha MURATHAN [2]

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[1] ozgurum@outlook.com,
orcid.org/0000-0002-7398-3330,
Ministry of National Education,
Türkiye

[2] talha.murathan@inonu.edu.tr,
orcid.org/0000-0002-9837-3707,
Inonu University, Türkiye

ABSTRACT

This study aims to examine the perceptions and effectiveness evaluations of blended learning environments among university students majoring in sports education at İnönü University and Fırat University. The research, conducted in the 2022-2023 academic year, is descriptive using quantitative methods, with a sample of 674 students from the Faculties of Sports Sciences at İnönü University and Fırat University. Data collected through the Blended Learning Environments Effectiveness Scale were analyzed using the SPSS program. The research findings indicate that students perceive face-to-face learning environments as more effective and contribute more to the learning experience ($x=4.062$). Blended learning environments are considered the second most effective learning environment ($x=3.841$). However, online learning environments ($x=3.342$) and technical issues ($x=2.957$) present some challenges. Correlation analysis reveals a moderate positive relationship between face-to-face learning environments and blended learning environments ($r=0.435$, $p<0.01$), as well as between online learning environments and blended learning environments ($r=0.540$, $p<0.01$). The effectiveness of blended learning environments for university students in sports education is associated with factors such as student motivation, student-teacher interaction, technical support, and communication. Face-to-face learning environments are perceived as the most effective by students and contribute significantly to the learning experience. Blended learning, as an effective method, has the potential to adapt to different learning styles and address technical challenges. However, careful attention is required regarding the effectiveness of online learning environments and technical support issues.

Keywords: *Blended learning, online learning, sports education, face-to-face learning.*

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INTRODUCTION

Education is considered a structure that influences individuals' behaviors and provides guidance. In the widespread implementation of education, there are various sub-elements, and one of these elements is sports education. The majority of practices in the field of sports consist of various educational content. Over time, these contents lead to the emergence of new learning models by benefiting from recent developments and technologies.

Blended learning is formed by integrating traditional face-to-face learning environments with online

learning environments using computer technologies. The blended learning approach combines online learning with student-student and student-teacher interactions. Blended learning aims to strike a balance between online learning and face-to-face learning within the classroom (Osguthorpe & Graham, 2003). In this context, it encourages social interaction by providing different tools for communication and collaboration (Osguthorpe & Graham, 2003; Thorne, 2003). It facilitates the revision of educational content by easily offering updatable materials (Tayebinik & Puteh, 2013). While blended learning brings advantages, it also has some limitations (Thorne, 2003). It is essential to consider that each student has different learning preferences, and this should be taken into account during education. In a blended learning environment, there may be a lack of interaction and discussion among students. The integration of blended learning requires sufficient technical infrastructure and support.

This study is rooted in constructivist learning theory, which posits that learners construct knowledge through interactions with their environment and experiences (Piaget, 1952; Vygotsky, 1978). Blended learning environments, which combine online and face-to-face interactions, align well with constructivist principles by providing diverse contexts for active learning and collaboration. The integration of technology in education is further supported by the Technology Acceptance Model (TAM) (Davis, 1989), which explains how users come to accept and use technology. According to TAM, perceived usefulness and perceived ease of use are primary factors influencing users' acceptance of technology. In the context of blended learning, these factors play a crucial role in determining students' engagement and satisfaction with the learning environment.

The purpose of this study is to examine the perceptions and effectiveness evaluations of blended learning environments among university students majoring in sports education at İnönü University and Firat University. This study aims to understand how blended learning environments impact student experiences and learning outcomes in sports education, providing insights to optimize pedagogical practices and learning environments. This study is limited to undergraduate students majoring in sports education at the Faculties of Sports Sciences at İnönü University and Firat University. The sample size is restricted to 674 students, and the data collection was conducted during the 2022-2023 academic year. The findings may not be generalizable to other universities or academic disciplines. It is assumed that the participants responded to the survey questions honestly and accurately. The study also assumes that the Blended Learning Environments Effectiveness Scale used in data collection is a valid and reliable tool for measuring students' perceptions of blended learning environments.

Blended learning, which significantly benefits teachers and is the main education component, enhances professional development and collaboration (Yu et al., 2022). However, technical issues that may arise can hinder the effectiveness of online components (Thrower et al., 2017). Therefore, technical support and training are necessary for the effective and efficient integration of technology into instructional practices (Liu et al., 2022). Blended learning models, integrating traditional in-class education with online learning platforms, have the potential to offer students flexibility, diversity, and effective learning experiences (Alammary et al., 2014). Interest in blended learning models has rapidly increased with technological developments, aiming to accommodate different learning preferences, enrich instructional processes, and enhance student engagement.

In recent years, technological advancements and pandemic conditions have accelerated the process of change and transformation in learning environments. Limitations in traditional in-class education have led students to turn to online learning platforms, increasing the popularity of blended learning models. Technological developments have facilitated the widespread adoption of blended learning by enabling students to access interactive and personalized education through online learning platforms. Sports education is a comprehensive discipline that contributes to individuals' physical, mental, and social development, and the blended learning model holds the potential to enrich learning experiences in this field. In sports education, blended learning adapts to different learning preferences, enhancing flexibility, participation, and learning outcomes (Calderón et al., 2020). Research in this field has observed a positive impact on student participation, motivation, and learning outcomes, effectively enhancing students' decision-making, problem-solving, and critical thinking skills (Pratama & Roesdiyanto, 2022; Chaloupský et

al., 2020).

Our study supports and extends the findings of Nikolopoulou (2022), who explored university students' preferences for face-to-face, online, and blended education. While Nikolopoulou's research indicates that sports science students find blended learning more interactive and satisfying compared to online learning, our study delves deeper into how blended learning environments affect academic performance and student engagement in sports education. Similarly, McCulloch, Allen, Boocock, and Peart (2022) focused on the online learning experiences of sports students and staff in the UK, highlighting a preference for a blended learning approach that combines synchronous online lectures with traditional methods. Our study builds on this by examining the impact of different learning preferences within blended learning environments and providing a comprehensive analysis of how these preferences shape students' educational experiences and outcomes. Furthermore, Wang, Omar Dev, and Soh (2023) conducted a systematic review on the effects of blended learning in physical education, demonstrating its superiority over online learning in providing better learning experiences. Our research not only supports these findings but also contributes to the literature by providing detailed insights into how blended learning models can be tailored to meet the specific needs of sports education students, thereby enhancing their decision-making, problem-solving, and critical thinking skills. By focusing on these aspects, this study aims to fill the gaps in current research and offer practical implications for educators and institutions seeking to implement effective blended learning strategies in sports education.

RESEARCH METHOD

Research Model

This study adopts a quantitative research approach employing a descriptive research design. Descriptive research aims to examine a specific situation at a particular point in time and, in this context, aims to assess the current state of blended learning environments in the field of sports education (Sessler & Imrey, 2015).

Participants

The population of this study consists of undergraduate students majoring in sports education at the Faculties of Sports Sciences at İnönü University and Firat University (2420 students). The sample size of 674 students was determined using convenience sampling, chosen due to the practical accessibility and cooperation of these universities. These students were approached voluntarily throughout the 2022-2023 academic year, and ethical approvals were obtained from the Scientific Research and Ethics Committee of İnönü University (05.10.2022-E.230323).

Convenience sampling, as described by Etikan, Musa, and Alkassim (2016), is a non-probability sampling technique where subjects are selected based on their convenient accessibility and proximity to the researcher. Although this method has limitations in terms of generalizability, it is widely used in educational research due to the practical feasibility of accessing a randomized sample (Creswell & Creswell, 2017). The selection of these two universities was based on several factors. Firstly, both universities have sports education programs and were willing to participate in the study, facilitating the logistics of data collection. Secondly, the geographical proximity of the two universities increased the logistical feasibility of the study and ensured easier coordination and consistency in data collection procedures. Thirdly, both universities actively implement blended learning environments in their sports education programs, providing a consistent context for examining the effectiveness of blended learning.

Finally, the sample included students from various class levels, enhancing the representativeness of the sample and providing a comprehensive understanding of students' perceptions and experiences across different stages of their education. This approach, supported by Fraenkel, Wallen, and Hyun (2019), strengthens the validity of the findings by including a diverse range of participants. Given the large sample size and its coverage of different cohorts, the sample's power to represent the population is considered adequate, providing meaningful insights into the effectiveness of blended learning environments in sports education.

Table 1. Demographic Characteristics of the Sample

Demographic Features		N	%
University	Firat University	324	48.1
	Inonu University	350	51.9
Class	1st Year	178	26.4
	2nd Year	168	24.9
	3rd Year	151	22.4
	4th Year	177	26.3
Grade Point Average	3.51-4.00	66	9.8
	3.01-3.50	318	47.2
	2.51-3.00	223	33.1
	2.01-2.50	62	9.2
	2.00 and below	5	0.7
Gender	Female	257	38.1
	Male	417	61.9
Joining Online Classes from Which Platform	My own computer	221	32.8
	My own smartphone	421	62.5
	My own tablet	8	1.2
	Someone else's computer, phone, tablet	24	3.6

Data Collection Tool

In this study, data were collected using the Personal Information Form and the Effectiveness of Blended Learning Environments Scale (EBLES) developed by Cabı and Gülbahar (2013). The EBLES is designed to measure students' perceptions of blended learning models in sports education. The scale's reliability and validity have been extensively tested and confirmed. The internal consistency of the EBLES was assessed using Cronbach's Alpha coefficient, which ranged from 0.70 to 0.93 across its four factors. A Cronbach's Alpha value of 0.70 and above is considered sufficient for the reliability of test scores (Büyüköztürk, 2006). Additionally, the scale's reliability was further evaluated using the Spearman-Brown split-half reliability method. The reliability coefficients obtained from this method are shown in Table 2. The Spearman-Brown coefficient for the four factors ranged from 0.66 to 0.92, indicating sufficient reliability.

Table 2. Cronbach's Alpha and Spearman-Brown Split-Half Reliability

Factor	Alpha	Split-Half Correlation
Factor 1	0.85	0.81
Factor 2	0.91	0.85
Factor 3	0.93	0.92
Factor 4	0.70	0.66
Total	0.94	0.80

As shown in Table 2, the Cronbach's Alpha coefficients and the Spearman-Brown split-half correlations indicate that the scale's reliability is adequate. The validity of the EBLES was assessed through factor analysis. The results of the factor analysis confirmed that the scale effectively measures the concept it intends to assess (Cabı & Gülbahar, 2013). Factor analysis is a statistical method used to determine the number and nature of underlying factors in a set of observed variables, ensuring that the scale items are appropriately grouped and reflective of the intended construct. The high reliability and confirmed validity of the EBLES make it a robust tool for evaluating the effectiveness of blended learning environments in sports education. This ensures that the data collected using this scale are both reliable and valid, providing a solid foundation for the analysis and interpretation of students' perceptions and experiences in blended learning settings.

Collection of Data

The data collection process was conducted within the specified population and sample by administering the scales face-to-face to voluntary participants. This process included the Demographic Information Form, which collects participants' personal information, along with the Effectiveness of Blended Learning Environments Scale.

Data Analysis

The acquired data were analyzed using the licensed SPSS 25.0 (Statistical Package for the Social Sciences) software package. Personal information was evaluated alongside the data from the Effectiveness of Blended Learning Environments Scale. The skewness and kurtosis values of the scale were within the range of +1.5 to -1.5, as suggested by Tabachnick and Fidell (2007), indicating that the distribution could be considered normal within this interval. It was determined that these values met the assumptions for correlation analysis and demonstrated a normal distribution for the scale and its subscales.

Table 3. Normality Test Results of the Effectiveness of Blended Learning Environments Scale and Its Sub-Dimensions (Skewness and Kurtosis Values)

Scale	N	Sd	Skewness	Kurtosis
Effectiveness Scale of Blended Learning Environments	674	3.624	0.632	[0.192; 0.094]
Face-to-Face Learning Environments	674	4.062	0.842	[0.939; 0.094]
Online Learning Environments	674	3.342	0.990	[0.298; 0.094]
Blended Learning Environments	674	3.841	0.757	[0.412; 0.094]
Technical Issues	674	2.957	1.089	[-0.016; 0.094]

Parametric tests such as Independent Samples t-Test and One-Way Analysis of Variance (ANOVA) were employed to assess the differentiation level of independent and dependent variables. The Scheffe Test was applied to identify the variables between which significant differences existed. However, despite the p-value being below 0.05 in the Scheffe Test, situations were observed where no significant differences existed between variables. Therefore, another test, the LSD test, was conducted. These results are presented in the ANOVA test tables. Additionally, Pearson Correlation Analysis was performed to determine the level and direction of the relationship between dependent variables.

FINDINGS

The findings of this study provide a comprehensive analysis of university students' perceptions and evaluations of blended learning environments in sports education. By examining data collected from students at İnönü University and Firat University, the study highlights the effectiveness of blended learning models in enhancing student engagement, satisfaction, and learning outcomes. The results offer valuable insights into how blended learning environments can be optimized to better meet the diverse needs of students in the field of sports education.

Table 4. Examination of the Effectiveness Scale of Blended Learning Environments and Its Sub-Dimensions According to the University Variable

Scale	Variable	N	\bar{X}	Sd	t-Value	p-Value
Effectiveness Scale of Blended Learning Environments	Firat University	324	3.739	0.651	4.594	0.000*
	Inonu University	350	3.518	0.595		
Face-to-Face Learning Environments	Firat University	324	4.043	0.845	-0.557	0.578
	Inonu University	350	4.079	0.841		
Online Learning Environments	Firat University	324	3.556	1.001	5.508	0.000*
	Inonu University	350	3.145	0.938		
Blended Learning Environments	Firat University	324	3.929	0.763	2.930	0.004*
	Inonu University	350	3.759	0.743		
Technical Issues	Firat University	324	3.067	1.188	2.519	0.012*
	Inonu University	350	2.856	0.979		

*p < 0.05

Statistical analysis based on the university variable was conducted using an independent sample t-test. Significant differences were observed in the total score of the scale, Online Learning Sub-dimension, Blended Learning Sub-dimension, and Technical Subjects Sub-dimension. The total score of the scale, as well as the online and blended learning sub-dimensions, showed statistically higher average scores for Firat University students compared to Inonu University students. In contrast, for the Technical Subjects Sub-dimension, the

scoring was reversed, indicating that Inonu University students had significantly more positive average scores than Firat University students. No significant difference was observed between the two university groups in the Face-to-Face Learning Sub-dimension (Table 4).

Table 5. Examination of the Effectiveness Scale of Blended Learning Environments and Its Sub-Dimensions According to the Gender Variable

Scale	Variable	N	\bar{X}	Sd	t-Value	p-Value
Effectiveness Scale of Blended Learning Environments	Female	257	3.618	0.630	-0.222	0.824
	Male	417	3.629	0.634		
Face-to-Face Learning Environments	Female	257	4.147	0.798	-2.081	0.038*
	Male	417	4.009	0.865		
Online Learning Environments	Female	257	3.274	0.996	-1.400	0.162
	Male	417	3.384	0.984		
Blended Learning Environments	Female	257	3.859	0.763	0.504	0.614
	Male	417	3.829	0.754		
Technical Issues	Female	257	2.894	1.077	-1.177	0.239
	Male	417	2.996	1.096		

*p < 0.05

Table 5 presents the results of the one-way analysis of variance (ANOVA) conducted to determine whether there is a difference in the effectiveness of blended learning environments and their sub-dimensions based on the gender variable. Upon examination, statistically significant differences were found in the Face-to-Face Learning Environments Sub-dimension concerning the gender variable. It was observed that female students expressed more positive views than male students in the Face-to-Face Learning Environments Sub-dimension.

Table 6. Examination of the Effectiveness Scale of Blended Learning Environments and Its Sub-Dimensions According to the Class Variable

Scale	Variable	N	\bar{X}	Sd	F	p-Value	LSD
Effectiveness Scale of Blended Learning Environments	(a) 1st Year	178	3.757	0.602	4.181	0.006*	a; b, d
	(b) 2nd Year	168	3.533	0.678			
	(c) 3rd Year	151	3.625	0.613			
	(d) 4th Year	177	3.577	0.613			
Face-to-Face Learning Environments	(a) 1st Year	178	4.228	0.743	7.743	0.000*	a; b, d c; b, d
	(b) 2nd Year	168	3.939	0.951			
	(c) 3rd Year	151	4.206	0.740			
	(d) 4th Year	177	3.887	0.861			
Online Learning Environments	(a) 1st Year	178	3.513	0.974	3.073	0.027*	a; b, c
	(b) 2nd Year	168	3.229	1.036			
	(c) 3rd Year	151	3.242	0.971			
	(d) 4th Year	177	3.363	0.958			
Blended Learning Environments	(a) 1st Year	178	3.932	0.732	1.821	0.142	-
	(b) 2nd Year	168	3.778	0.766			
	(c) 3rd Year	151	3.879	0.771			
	(d) 4th Year	177	3.776	0.755			
Technical Issues	(a) 1st Year	178	3.044	1.169	0.723	0.539	-
	(b) 2nd Year	168	2.896	1.098			
	(c) 3rd Year	151	2.899	1.010			
	(d) 4th Year	177	2.978	1.064			

*p < 0.05

The results of the one-way analysis of variance (ANOVA) conducted to determine whether there is a difference in the effectiveness of blended learning environments and their sub-dimensions based on the class variable are presented in Table 6. In the Blended Learning Environments Effectiveness Scale (p-Value= 0.006),

a significant difference was found between students in the 1st year and those in the 2nd and 4th years, with 1st-year students expressing more positive views compared to 2nd and 4th-year students. In the Face-to-Face Learning Environments Sub-dimension (p-Value= 0.000), a significant difference was found between students in the 1st year and those in the 2nd and 4th years, as well as between students in the 3rd 2nd and 4th years. 1st-year students and 3rd-year students expressed more positive views compared to 2nd and 4th-year students. In the Online Learning Environments Sub-dimension (p-Value= 0.027), a significant difference was found between students in the 1st year and those in the 2nd and 3rd years, with 1st-year students expressing more positive views than 2nd and 3rd-year students.

Table 7. Examination of the Effectiveness Scale of Blended Learning Environments and Its Sub-dimensions According to the Grade Point Average Variable

Scale	Variable	N	\bar{X}	Sd	F	p-Value	LSD
Effectiveness Scale of Blended Learning Environments	(a) 3.51-4.00	66	3.515	0.585	1.138	0.337	-
	(b) 3.01-3.50	318	3.617	0.609			
	(c) 2.51-3.00	223	3.631	0.672			
	(d) 2.01-2.50	62	3.746	0.630			
	(e) 2.00 and below	5	3.748	0.789			
Face-to-Face Learning Environments	(a) 3.51-4.00	66	4.056	0.908	2.697	0.030*	b; c,d
	(b) 3.01-3.50	318	4.166	0.783			
	(c) 2.51-3.00	223	3.968	0.892			
	(d) 2.01-2.50	62	3.893	0.824			
	(e) 2.00 and below	5	3.780	1.028			
Online Learning Environments	(a) 3.51-4.00	66	3.099	0.951	3.807	0.005*	a; c,d b, d
	(b) 3.01-3.50	318	3.269	1.005			
	(c) 2.51-3.00	223	3.417	0.953			
	(d) 2.01-2.50	62	3.668	0.998			
	(e) 2.00 and below	5	3.842	0.896			
Blended Learning Environments	(a) 3.51-4.00	66	3.861	0.721	0.170	0.954	-
	(b) 3.01-3.50	318	3.824	0.727			
	(c) 2.51-3.00	223	3.841	0.823			
	(d) 2.01-2.50	62	3.907	0.708			
	(e) 2.00 and below	5	3.810	0.855			
Technical Issues	(a) 3.51-4.00	66	2.627	1.067	2.071	0.083	-
	(b) 3.01-3.50	318	3.013	1.066			
	(c) 2.51-3.00	223	2.932	1.120			
	(d) 2.01-2.50	62	3.106	1.094			
	(e) 2.00 and below	5	3.080	0.831			

*p<0.05

The results of the one-way analysis of variance (ANOVA) conducted to determine whether there is a difference in the effectiveness of blended learning environments and their sub-dimensions based on the grade point average (GPA) variable are presented in Table 7. In the Face-to-Face Learning Sub-dimension (p-Value= 0.030), a significant difference was found between students with a GPA of 3.01-3.50 and those with GPAs of 2.51-3.00 and 2.01-2.50, with students with a GPA of 3.01-3.50 expressing more positive views. When examining the Online Learning Environments Sub-dimension (p-Value= 0.005), a significant difference was found between students with a GPA between 3.51-4.00 and those with GPAs of 2.51-3.00 and 2.01-2.50. Additionally, a significant difference was found between students with a GPA of 3.01-3.50 and those with a GPA of 2.01-2.50. Students with lower GPAs expressed more positive views.

Table 8. Examination of the Effectiveness Scale of Blended Learning Environments and Its Sub-Dimensions According to the Variable of Joining Online Classes from Which Platform

Scale	Variable	N	\bar{X}	Sd	F	p-Value	LSD
Effectiveness Scale of Blended Learning Environments	My own computer	221	3.650	0.648	0.617	0.610	-
	My own smartphone	421	3.617	0.620			
	My own tablet	8	3.361	0.588			
	Someone else's computer, phone, tablet	24	3.617	0.717			
Face-to-Face Learning Environments	My own computer	221	4.087	0.886	1.185	0.315	-
	My own smartphone	421	4.047	0.812			
	My own tablet	8	3.612	0.964			
	Someone else's computer, phone, tablet	24	4.229	0.895			
Online Learning Environments	My own computer	221	3.363	1.025	0.073	0.975	-
	My own smartphone	421	3.331	0.969			
	My own tablet	8	3.276	0.831			
	Someone else's computer, phone, tablet	24	3.379	1.118			
Blended Learning Environments	My own computer	221	3.920	0.777	2.649	0.048*	a,d
	My own smartphone	421	3.822	0.742			
	My own tablet	8	3.518	0.635			
	Someone else's computer, phone, tablet	24	3.541	0.787			
Technical Issues	My own computer	221	2.787	1.178	5.501	0.001*	d;a,b,c a;b,d
	My own smartphone	421	3.018	1.032			
	My own tablet	8	2.550	1.179			
	Someone else's computer, phone, tablet	24	3.600	0.842			

*p<0.05

The results of the one-way analysis of variance (ANOVA) conducted to determine whether there is a difference in the effectiveness of blended learning environments and their sub-dimensions based on the variable "Which Platform They Use for Online Classes" are presented in Table 8. In the Blended Learning Sub-dimension (p-Value= 0.048), a significant difference was found between students using their own computer and those using someone else's computer, tablet, or phone, with students using their own computer expressing more positive views. In the Technical Issues Sub-dimension (p-Value= 0.001), a significant difference was found between students using someone else's computer, tablet, or phone, and other students. Students using someone else's computer, tablet, or phone reported more technical problems and expressed more negative views. Additionally, a significant difference was found between students using their own computer and those using their own phone and someone else's computer, phone, or tablet. Students using their own computer reported more positive views than other students.

DISCUSSION

This study aims to reveal the effectiveness of blended learning environments in university students undergoing undergraduate education in the field of sports sciences. In the conducted analyses, it was observed that the face-to-face learning environments sub-dimension was evaluated with the highest scores by the participants. This result indicates that factors such as face-to-face interaction, communication, and guidance positively influence participants' learning experiences. Previous research also supports that face-to-face learning environments enhance student motivation and provide an effective learning experience (Güneş, 2018; Yıldız, 2016).

Aksel (2021) reported that students prefer face-to-face learning the most to blended and online learning models (Aksel, 2021). Yapıcı (2019) found that the face-to-face aspect of the blended learning

method is preferred to a greater extent than the online aspect (Yapıcı, 2019). In another study, Öztaş (2022) revealed that students prefer traditional face-to-face learning within the scope of blended learning over online learning (Öztaş, 2022).

The sub-dimension of blended learning environments was evaluated with a slightly lower average score. This result indicates that blended learning environments are perceived as effective by students and can accommodate different learning styles. Students have expressed that they learn more effectively in blended learning environments (Eryılmaz, 2015). It has been revealed that students have a highly positive attitude towards blended learning environments. However, it is noted that some students face challenges related to technical issues in these environments and require more support (Aksel, 2021).

The sub-dimension of online learning environments received slightly lower ratings. This result suggests that online learning environments may be associated with some challenges, and students may seek more factors such as face-to-face interaction and guidance. Previous studies have indicated that online learning environments can reduce student motivation and lead to issues such as a lack of communication. One of the main disadvantages of online learning is the absence of direct interaction with instructors and peers (Sepulveda-Escobar & Morrison, 2004). Online learning may require resources such as virtual student support and helpdesk services (Khalil et al., 2018). In an online learning environment, students may feel isolated and have limited opportunities for real-time interaction, which can hinder their learning experiences (Karaman, 2011).

In the study, it was observed that the sub-dimension of Technical Issues had the lowest average score. This result indicates that students may encounter technical difficulties and internet connectivity issues. Technical problems also pose challenges in blended learning environments. These issues may include browser incompatibility, unequal audio quality, and internet connectivity problems that can disrupt the learning experience. Therefore, strengthening technical support mechanisms and improving students' access to technological infrastructure are crucial (McGuinness & Fulton, 2019).

In university students majoring in sports education, various relationships were found between the effectiveness scale and sub-dimensions of blended learning environments. The results of the correlation analysis indicate a weak and positive relationship between face-to-face learning environments and online learning environments ($r=0.152$, $p<0.01$). This result suggests a low-level relationship between the effectiveness of face-to-face learning environments and online learning environments. Additionally, a moderately positive relationship was found between face-to-face learning environments and blended learning environments ($r=0.435$, $p<0.01$). This result indicates a relationship between the effectiveness of face-to-face learning environments and blended learning environments. Participants expressed that they benefited more from instructors in face-to-face learning environments, received more assistance from instructors, and believed they learned better. Moreover, they communicated more comfortably with their peers and emphasized the importance of achieving set goals.

Differences were observed in the comparisons between Firat University and İnönü University students. Firat University students generally found blended learning environments more effective and scored higher in the online learning environments sub-dimension. It was also observed that İnönü University students experienced fewer technical issues (Table 4). These differences are assumed to stem from factors such as educational programs, teaching methods, and technical infrastructure among the universities.

Although the focus on İnönü University and Firat University in this study may seem limited, this approach provides a detailed and contextual analysis of blended learning environments in a specific educational setting. This targeted analysis provides a solid foundation for understanding the unique challenges and opportunities presented by blended learning in sports education. The findings are in line with recent studies such as Calderón et al. (2020) and Pratama and Roesdiyanto (2022) that emphasize the importance of context-specific research in drawing meaningful conclusions about educational practices. Therefore, the insights gained from this study can inform similar educational settings and contribute to the ongoing discourse on the implementation and optimization of blended learning models in higher education.

In the analysis based on the gender variable in the research, no significant difference was found in the effectiveness scale of blended learning environments. However, it was observed that women scored

slightly higher in the sub-dimension of face-to-face learning environments. No significant difference was observed between genders in other sub-dimensions. These results indicate that the influence of blended learning environments on gender is limited. Khechine and colleagues (2014) reported that gender did not have a regulatory effect on the intention to use webinars in blended learning (Khechine et al., 2014).

In the analyses based on the class variable, differences were observed between the scale and sub-dimensions. First-year students found the effectiveness scale of blended learning environments as a whole and the face-to-face learning environments sub-dimension more effective. In the online learning environments sub-dimension, first-year students scored lower than other classes. However, no significant difference was found based on the class variable in blended learning environments and the Technical Issues sub-dimension. Previous studies have also reported that first-year students have the lowest positive attitudes compared to other classes regarding online learning environments (Birbal et al., 2018).

The analysis of the platform used to attend online classes revealed a significant impact on the sub-dimension of blended learning environments. Participants who used their computers found blended learning environments more effective than others' computers, phones, or tablets. We can speculate that students who use their computers may perceive online learning environments as more accessible and convenient than other students. Research has shown that online platforms, such as e-learning education platforms and social media platforms, can play a crucial role in the effectiveness of blended learning (Kavadella et al., 2011; Barry et al., 2015).

This study demonstrates that blended learning environments are an effective learning model for university students majoring in sports education. The integration of face-to-face and online learning elements provides students with flexibility tailored to their learning needs. However, factors such as technical issues and lack of support need to be considered. The effectiveness of blended learning environments for university students in sports education is associated with factors such as student motivation, teacher-student interaction, technical support, and communication. It is believed that this study will contribute to the improvement of sports education programs and the optimization of teaching methods.

CONCLUSION AND SUGGESTIONS

This study aimed to explore the perceptions and effectiveness evaluations of blended learning environments among undergraduate students majoring in sports education at İnönü University and Firat University. The findings indicate that face-to-face learning environments are perceived as the most effective by students ($X=4.062$) and are seen to significantly contribute to the learning experience. Blended learning environments, which combine face-to-face and online learning elements, are identified by students as the second most effective learning environment ($X=3.841$). These environments have the potential to help students adapt to different learning preferences, although challenges related to technical issues and the need for additional support have been indicated.

Blended learning strategies demonstrate the potential to provide an effective learning experience for university students in sports education. By integrating traditional face-to-face instruction with online resources, blended learning can enhance student participation, motivation, and learning outcomes. This approach offers flexibility and innovation in teaching and learning, accommodating different learning preferences and providing access to a variety of resources. However, successful implementation requires addressing challenges such as technical issues and the digital divide. Strengthening technical support mechanisms and improving students' access to technological infrastructure are crucial.

The results of this study have several implications for educators, administrators, and policymakers. Educational institutions should continue to invest in and expand blended learning models, providing adequate technical support and training for both instructors and students. Curriculum designers should incorporate various interactive and collaborative tools to further enhance the learning experience and cater to different learning preferences. Additionally, regular feedback from students can help identify areas for improvement and ensure that learning models remain responsive to their needs.

Improving blended learning environments and developing pedagogical strategies that better respond to students' needs are essential. Educators should develop effective communication strategies in online learning environments and leverage technological resources to support students. The use of strategies that

enhance interaction, communication, and guidance among students in sports education programs is recommended to better integrate factors such as face-to-face interaction and guidance, ultimately increasing the effectiveness of online learning environments.

In conclusion, while the study was limited to two universities, the findings offer valuable insights that can inform the broader implementation of blended learning in higher education. Blended learning has the potential to transform sports education, providing meaningful and effective learning experiences, accommodating different learning preferences, and addressing technical challenges. By addressing these challenges and leveraging the opportunities presented by blended learning environments, educators can create more dynamic and effective educational experiences that better prepare students for the demands of the modern world.

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