

STUDENT PERCEPTIONS OF BLENDED LEARNING AND ITS EFFECTIVENESS IN HIGHER EDUCATION

Abdurrahman Ghaleb Almekhlafi¹
Farouq Almeqdadi²
Mohammad Alsadi³

ABSTRACT

Objectives: This study explores university students' perceptions of the effectiveness of blended learning in higher education within the United Arab Emirates (UAE), addressing a gap in regional research on this instructional model.

Theoretical Framework: The study builds on theories of blended learning and its applicability in enhancing educational outcomes, leveraging technological advancements for flexible learning.

Method: A quantitative approach was employed, utilizing a 5-point Likert scale questionnaire to gather data on students' views regarding the significance and utilization of blended learning.

Results and Discussion: The findings reveal predominantly positive perceptions of blended learning among students, highlighting its role in fostering satisfaction and effective instruction. These insights underscore the potential of blended learning to meet diverse educational needs.

Research Implications: The study provides policy, strategic, and pedagogical recommendations for integrating blended learning into higher education curricula in the UAE.

Originality/Value: This research contributes to the limited literature on blended learning in the UAE, offering practical implications for enhancing higher education practices in alignment with SDG 4 (Quality Education).

Keywords: blended learning, student perspectives, higher education, United Arab Emirates, SDG 4, Sustainable Development Goals (SDGs).

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1 INTRODUCTION

The increasing prevalence of the blended learning model in higher education institutions worldwide reflects the appeal and scope of this learning

¹ Educational Technology, Hamdan Bin Mohammed Smart University, United Arab Emirates.

E-mail: a.almekhlafi@hbmsu.ac.ae

² Curriculum & Instruction (Math Education), Al al-Bayt University, Jordan.

E-mail: falmeqdadi@aabu.edu.jo

³ Education administration department, Ajloun National University, Jordan.

E-mail: M.alsadi@anu.edu.jo



method. From a student perspective, blended learning is widely regarded as a way to access higher education with the least disruption to their daily lives. Consequently, researchers have been particularly interested in the recent and significant shifts that have been seen in teaching and learning methodologies from traditional to blended contexts. The blended learning approach combines a traditional classroom's teaching and learning concepts with a high-tech e-learning environment (Graham C.R., 2006; Graham, Woodfield, and Harrison, 2012). It is aptly described by Singh and Reed (2001, p.1) as "a learning program where more than one delivery mode is being used to optimize the learning outcome and cost of program delivery."

Cronje (2020) also provides a novel and succinct definition of blended learning, which he defines as: "The appropriate use of a mix of theories, methods, and technologies to optimize learning in a given context" (p.120). According to researchers, the blended learning model provides a structured method for fundamental skills or learning content (behaviorist approach), while the constructivist course design involves stimulating and empowering students during their studies. On the underlying theory behind blended learning, Cronje (2020) states that the blended learning environment incorporates both behaviorist and constructivist approaches to learning (Cronje, 2020; Laurillard, 2002). To benefit from a blended learning environment, students must engage and communicate with other students and be able to analyze, reflect, integrate, structure, and streamline information and create and contribute their ideas (Laurillard, 2002).

2 LITERATURE REVIEW

Blended learning is an approach to education that combines traditional classroom instruction with online learning activities. It is a mix of face-to-face and online learning and can take various forms, including flipped classrooms, hybrid courses, and online courses with occasional face-to-face meetings. Graham *et al.* (2019) define blended learning as "the strategic combination of online and in-person instruction" (p. 11). Accordingly, it is partly due to its dynamic character that blended learning has the potential to transform higher



education by providing a more flexible, personalized, and engaging learning experience for students.

Blended learning has several advantages, such as providing students greater flexibility and convenience while maintaining the benefits of face-to-face interaction with instructors and peers. It can also help personalize the learning experience, allowing students to work independently and receive personalized feedback. On the other hand, there are challenges, as blended learning can be difficult for instructors to implement, requiring a new set of skills and approaches to teaching. It may also necessitate significant investment in technology and training.

In addition to the benefits and challenges of blended learning, there are some best practices to ensure its success in higher education. These include carefully planning and designing the course, providing adequate support and resources for both instructors and students, and continually assessing and adjusting the approach based on feedback and outcomes.

The amount of research on blended learning is rapidly increasing. In one study alone, Drysdale *et al.* (2013) examined almost 200 English-language dissertations that explored blended learning approaches. Similarly, the ubiquity of literature on the subject has facilitated a number of review studies, such as those by Halverson *et al.* (2012), in which they identified the most popular journal articles, book chapters, books, white papers, authors, and journals publishing blended learning research. Their subsequent studies included a thematic analysis of the research questions and inquiry methodologies employed to pinpoint their strengths and potential future research areas (Halverson *et al.*, 2014). While the depth of literature included in these studies was significant, the geographical scope was somewhat limited.

Consequently, Spring *et al.* (2016a, 2016b, 2017) conducted a series of studies to understand better the landscape of blended learning across seven worldwide regions. This was because less than 5% of the articles in the Drysdale *et al.* (2013) and Halverson *et al.* (2012; 2014) studies focused on blended learning issues and contexts outside North America.

Focusing on higher education, Hussain, Shahzad, and Ali (2019) conducted a qualitative study examining the practices and problems associated



with blended learning. A convenient, purposive sampling method was used, and qualitative information was gathered from 30 university professors and 60 undergraduate students through focused group interviews. The researchers thematically analyzed the data while considering the study's goals. The study showed that university undergraduate students and faculty support in-person instruction with online resources. They received text-based handouts, PowerPoint presentations, and videos from websites like YouTube, repositories, search engines, and databases. Blended learning was used in every lesson and the learning process, and social media was used for interaction and communication. According to the study, blended learning actively involves undergraduate students in the teaching and learning process.

Poon (2013) investigated the impact of various teaching delivery methods (face-to-face, online, and blended) on students' ability to improve their business presentation skills during a one-year intensive English course. Three groups of students (N = 180) practiced 30 business presentation sessions in face-to-face, online, and blended modes across four batches from 2017 to 2020. They were evaluated by three tutors with the same level of training and experience. A pre-test and a post-test were administered to assess presentation abilities. The blended group practiced 70% online and 30% in a physical classroom, while the online group received all their training online. All three groups demonstrated improved performance.

The blended learning model used traditional methods for 46 students in the control class. Data was collected from pre- and post-test results, observations, and student opinions. Tucker's action research project (2018) aimed to determine whether a blended learning approach increased student engagement in an early childhood classroom. Participants included three-year-olds with individual educational plans and general education four- and five-year-olds from diverse socio-economic backgrounds in a half-day preschool program. Quantitative data was collected through observation, recording student engagement levels during a 20-minute small group period for nine weeks. Qualitative data were gathered through teacher and para-educator observations, student interviews, and diary notes.



Tong, Uyen, and Ngan (2022) conducted a study to determine the efficacy of the flex model of blended learning in teaching mathematics, focusing on enhancing students' academic performance, self-study abilities, and learning attitudes. A quasi-experiment used a survey to compare the academic performance, self-study abilities, and learning attitudes of 44 students in the experimental group. Quantitative and qualitative (using interviewing techniques) analyses were performed on the data, demonstrating that blended learning positively impacted students' academic achievement. In the same study, observations and student opinion survey results showed that blended learning increased student interactions with teachers and enhanced learning attitudes, self-study skills, and academic achievement. However, time restrictions prevented some students from advancing, and the study's modest sample size may limit the generalizability of the findings. Therefore, further research should consider enhancing the efficacy of teaching and learning within various blended learning models, expanding the scope of research on the impact of blended learning in other subjects, or increasing the sample size.

Several studies have explored student and teacher perceptions and experiences of blended learning. One such study by Rifai and Sugiman (2018) evaluated seventh-grade students' opinions of their mobile blended learning experience in mathematics utilizing smartphones. The study found that students had a favorable opinion of mobile-integrated learning and enjoyed collaborative and discussion activities in the classroom but struggled with learning on their own using online forums supported by web tools and mobile devices. Hass's qualitative study (2022) focused on classroom procedures and found that using art and group work improved students' understanding of literary elements and piqued students' curiosity about memoirs.

Other research studies centered on blended learning include Weinhandl *et al.*'s (2018) study on the implementation of the Flipped Classroom Approach (FCA) in mathematics education in secondary schools, Avineri *et al.*'s (2018) research on technology-supported professional growth for math teachers, Attard and Holmes's (2020) investigation of technology-mediated practices in mathematics classrooms in Australian schools, and Mukuka *et al.*'s (2021) descriptive survey study on secondary school students' experiences.



3 THEORETICAL FRAMEWORK

Cognitive and constructivist approaches have influenced blended learning in higher education since the 1990s (Al-Huneidi and Schreurs, 2010). However, the challenge for course designers is successfully creating blended learning environments using applicable theory. Theories that have contributed to blended learning environments include the theory of motivation (Keller, 1983), conversation theory (Laurillard, 2002), the Community of Inquiry (CoI) model (Garrison, Anderson, and Archer, 2000), and the Complex Adaptive Blended Learning System (CABLS) (Wang, Han, and Yang, 2015), among others. Various researchers have also developed measures to aid in understanding students' perceptions of different components of the online learning environment, such as Khan (1997), Reeves and Reeves (1997), Jegede *et al.* (1998), and Palloff and Pratt (1998).

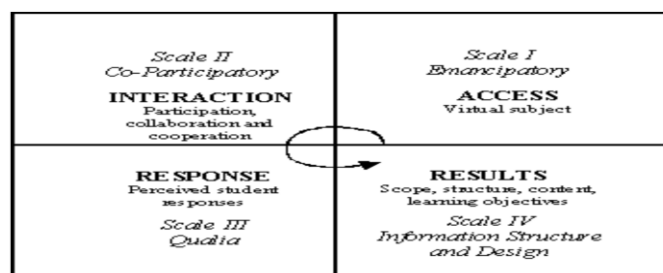
The current study's theoretical underpinnings began with a review of Tobin's (1998) work on Connecting Communities of Learning (CCL), which focused on students' perceptions of a computer program as part of a blended course delivery model. Tobin established fifteen categories "considered salient to the learning environment preferred and experienced by the study participants" (Tobin, 1998, p. 150) and grouped them under three broad dimensions. The first dimension was Emancipatory activities (Tobin, 1998, p.151), which included convenience, efficiency, and autonomy. The second dimension was Co-participatory activities (Tobin, 1998, p.152), which included flexibility, reflection, quality, interaction, feedback, and collaboration. The third dimension was Qualia (Tobin, 1998, p.155), which included satisfaction, enjoyment, confidence, success, tedium, and frustration.

A researcher-developed questionnaire was used to evaluate each dimension, and thus, Tobin's framework could then be used to assess the quality of the online environment. Soon after, Chang and Fisher (2001) developed the Web-based Learning Environment Instrument (WEBLEI) to gather students' perceptions of their learning environment. The WEBLEI was subsequently revised in 2003 to specifically apply to courses with 'supplemental use' of web-based learning, meaning it could be used to understand student perceptions in

blended learning environments. Figure 1 illustrates the four scales of the WEBLEI model(Aslsadi *et all*, 2024).

Figure 1

WEBLEI by Chang and Fisher (2001, 2003)



Chang and Fisher (2003) identified four primary scales in the WEBLEI that measured access, interaction, response, and results. The Access scale determined how well the characteristics of the LMS matched students' expectations, while the Interaction scale measured how much interaction was accomplished from the student's perspective. The Response scale indicated how the students felt about utilizing the LMS to learn content, and the Results scale indicated how well the students met the learning objectives by using the learning resources available through the LMS. The first three scales were based on Tobin's (1998) CCL study, while the last scale (Results) focused on the web-based material's content, structure, and design.

Chang and Fisher developed a ten-part questionnaire to assess student perceptions of utilizing a blended learning environment for learning content. For this study, a fifth scale, Course Instructor, was introduced since the original instrument proposed by Chang and Fisher (2001, 2003) failed to consider the 'course instructor' aspect.

Regarding student access, Shea (2007) argues that blended learning can provide the necessary prerequisites to facilitate improved accessibility, both in terms of time and space. However, researchers have cautioned that the quality of education in a blended learning environment should be maintained or improved to avoid a loss. Shea provides the following broad definition of quality: "high levels of learning and high levels of student and faculty satisfaction and ultimately increased access and more efficient deployment of



existing physical resources" (Shea, 2007, p. 20). To this point, Bliuc, Goodyear, and Ellis (2007) advocate for research focusing on student learning outcomes and the quality of student learning experiences. Table 1 summarizes the findings of several studies that examined students' experiences in a blended learning setting.

Table 1

Research findings of students' experience in blended learning.

Scale	Research findings on introducing BL.	Studies
1: Access	Flexibility and ease of use	Anne-Mette <i>et al.</i> , 2018; Diep, <i>et al.</i> 2017; Ghazal <i>et al.</i> 2017; Krasnova and Vanushin, 2016; Mozelius and Hettiarachchi, 2017; Santakumari and Sajith 2015; Bonnici <i>et al.</i> 2014; M.G. 2020
2: Interaction	Focus on student needs and expectations.	Gyamfi and Gyaase, 2015; Bonnici <i>et al.</i> 2014; Poon and Joanna, 2013
3: Response	Student satisfaction and motivation	Gyamfi and Gyaase, 2015; Bakeer, 2018; Islam, <i>et al.</i> 2018; Sahni, 2017; Tseng and Walsh, 2016
4: Results	Increased awareness of course objectives and Improved learning outcomes	Suda <i>et al.</i> 2014 and Abdulrahman, <i>et al.</i> 2020; Suda <i>et al.</i> 2014; M.G. 2020; Baragash and Al-Samarraie, 2018; Tseng and Walsh, 2016; Hamad, 2015; Shantakumari and Sajith, 2015; Murillo-Zamorano, SánchezAna, and LuisaGodoy-Caballero, 2019

3.1 STUDENT PREFERENCE AND SATISFACTION

Understanding the factors that shape students' satisfaction and preference for learning is essential for attaining the goal of effective teaching. Four main factors influence students' satisfaction: instructor expertise, the Learning Management System (LMS), the course and task content, and flexibility and ease of use (Anne-Mette *et al.*, 2018; Diep *et al.*, 2017; Ghazal *et al.*, 2017; Krasnova and Vanushin, 2016; Mozelius and Hettiarachchi, 2017; Santakumari and Sajith 2015).

Research suggests that many students prefer blended learning over the traditional teaching method and often report higher satisfaction with the learning experience (Gyamfi and Gyaase, 2015). Within the blended learning model, students have reported a preference for certain features over others. The first feature is the accessibility of the online material that allows students





to study more often and thus results in higher grades (Abdulrahman *et al.* 2020; Suda *et al.* 2014; MG 2020). Secondly, students expressed satisfaction with the comparatively rapid access to assessment feedback facilitated via blended learning platforms (Krasnova and Vanushin, 2016). Thirdly, the efficacy and flexibility of the blended learning model helped the students manage their busy lifestyles (Bonnici *et al.* 2014; MG 2020). Moreover, it saves a significant amount of time, which, for example, may have been spent traveling to class and looking for a parking space that they found troublesome (Dziuban *et al.* 2018).

On the other hand, studies have shown that students' enrollment in blended learning does not always indicate a student's preference. A study conducted by Weldy (2018) found that while many students were enrolled in blended learning courses, many preferred traditional classroom teaching. A study by Shantakumari and Sajith (2015) revealed that students' satisfaction and preference may vary based on their course content. This is because some courses require more hands-on activities than others, and blended learning was not the optimal option for the students. For instance, Blissitt (2016) studied the satisfaction level of students based on the delivery method of the introductory pathophysiology courses, and the results showed that students in the traditional group were significantly more satisfied than those in the blended learning group.

3.2 STUDENT PERCEPTIONS OF THE UTILIZATION OF BLENDED LEARNING

A few differences were found in the perception of learning according to the delivery method. For example, many students view blended learning as a great tool that makes them more motivated to learn (Bakeer, 2018; Islam *et al.* 2018; Sahni, 2017; Tseng and Walsh, 2016), increased their awareness of course objectives (Suda *et al.* 2014), and helped them meet different learning styles (Gyamfi and Gyaase, 2015; Bonnici *et al.* 2014; Poon and Joanna, 2013). Nevertheless, some students still felt that they learn more in person with a teacher present than in an online environment (Namyssova *et al.* 2019; Lee *et al.* 2017; Shu and Gu 2017; Weldy 2018). Another example reported by Krasnova and Vanushin (2016) indicated that some students preferred blended learning



for its frequent written tasks, as it improved their grammar and vocabulary. For the same reason, however, some students preferred the delivery method in person as it requires less written materials (Lee *et al.* 2017). Furthermore, some students perceived blended learning as a great approach to learning. This implies that students' learning styles play a role in student learning achievement and satisfaction (Cheng and Chau, 2016). Overall, blended learning had a positive impact on students' performance and resulted in many achieving improved learning outcomes (Baragash and Al-Samarraie, 2018; Tseng and Walsh, 2016; Hamad, 2015; Shantakumari and Sajith, 2015; Murillo-Zamorano, Sánchez Ana, and Luisa Godoy-Caballero, 2019), especially on those who were taking STEM subjects (Abdulrahman *et al.* 2020; Vo *et al.* 2017).

3.3 STUDENT PERCEPTIONS OF BLENDED LEARNING

The blended learning approach provides several advantages when comparing traditional and blended learning teaching methods. One of the top advantages of instruction with blended learning is the integration of video content. Videos and podcasts were students' most preferred approaches for learning (Coyne *et al.*, 2018; Weldy, 2018), and when compared to traditional the approach, students felt that it was more efficient to watch videos online rather than watching them in class (Krasnova and Vanushin, 2016). Moreover, collaborative projects and student-led activities were also considered successful teaching methods (Tamim, 2017).

Although blended learning can be an effective means of teaching, students believe that the format of the blended learning approach should be changed based on the course of study to improve the way it is experienced. This was especially evident for the courses requiring more hands-on experience or a large cohort (Shantakumari and Sajith, 2015; Owston, York, and Malhotra, 2019). In addition, Kintu *et al.* (2017) stated that some blended learning teaching methods, such as wikis and blogs, were not particularly effective as students rarely used them.



3.4 FACTORS THAT IMPACT STUDENT PERCEPTIONS OF BLENDED LEARNING

Studies investigating learner characteristics influencing their perceptions of blended learning showed no significant difference regarding students' age group and gender (Kintu and Zhu, 2016; Mozelius and Hettiarachchi, 2017). Motivational factors, nonetheless, had the most significant influence; that is, students with high task value, e-learning motivation, and self-efficacy were observed to prefer studying in blended learning environments (Anthony *et al.* 2019; Hubackova and Semradova 2016; Keskin and Yurdugul, 2019; Kintu *et al.* 2017). According to Dang *et al.* (2016), self-efficiency significantly impacted female students' perception of blended learning. This was despite the male students initially scoring higher in terms of self-efficiency.

In terms of computer skills, studies showed that computer skills do not influence students' perception of using blended learning. For instance, students in their fourth year of study were more into blended learning than those in their first year (Alzahrani and O'Toole, 2017). Overall, Tang and Chaw (2016) suggest that having computer skills does not necessarily indicate that students know how to use computers for learning. Therefore, it is important to have digital literacy as a prerequisite for effective blended learning courses.

Regarding the number of hours using the Internet, AlZahrani and O'Toole (2017) stated that there is no relation between the number of hours spent on the Internet and students' preferences. The Internet only influences the blended learning approach by influencing its effectiveness. Having no internet connection or slow Internet reduces the program's effectiveness but does not affect students' preferences in general (Gyamfi and Gyaase, 2015). Tang and Chaw (2016) highlighted the importance of having digital literacy as a prerequisite for effective blended learning courses because even if students have computer skills, they may not have the skills necessary to use computers for learning.



3.5 OBJECTIVES OF THE STUDY

This study aims to investigate university students' perceptions of the effectiveness of blended learning within the higher education sector in the UAE. The authors formulated three research questions to be answered in this study, which have been listed below:

1. What are the key differences between student preferences for blended learning versus traditional learning?
2. What are the key differences between student perceptions of utilizing blended learning versus traditional learning?
3. What are the key differences between student perceptions towards blended learning due to their level, computer skill, and number of hours using the Internet?

3.6 SIGNIFICANCE OF THE STUDY

The term 'blended' learning denotes that this learning approach incorporates traditional and digital web-based elements. Given the increased complexity, teachers may often face challenges when attempting to create an effective blended environment for their students, especially within higher education. However, technological advancements and increased digital literacy among staff have enabled students in the UAE to increasingly engage in and benefit from blended learning at their convenience and location. This technological progress has diversified teaching and learning methods and extended their applicability across various educational contexts. To this point, our research sought to investigate the efficacy of blended learning within the UAE's higher education sector from a student-centric perspective. This was done by probing students' perspectives on the relevance and application of the blended learning model in effective instruction. Due to the lack of similar research on blended learning in the UAE, this study provides data and insights that further enrich the current body of knowledge on the subject while generating recommendations encompassing policy, strategic, and pedagogical considerations.



4 RESEARCH METHODS

4.1 PARTICIPANTS

The study participants were comprised of 128 students enrolled at the UAE University in a fully-fledged blended learning course and traditional face-to-face courses. The participants were categorized into two groups based on the delivery method, with 76 studying using a blended mode, while 52 followed a traditional delivery strategy. Participation in the study was purely voluntary, and participants were informed that they could withdraw from the study at any point in time and were assured that the collected data would only be used for academic purposes and that their identity would remain anonymous.

4.2 DATA COLLECTION

4.2.1 Questionnaire development, validity, and reliability

The questionnaire used in the study was adapted from a previous study conducted by Almekhlafi *et al.* (in press). However, the validity of the adapted version of the questionnaire was questioned by a panel of university professors from different specializations, including curriculum and instruction, educational technology, and psychology. Based on the reviewers' feedback, rephrasing changes of items were applied. The reliability of the questionnaire was established by running Cronbach Alpha, which resulted in a very high alpha for this study (0.9).

The questionnaire aimed to explore participants' perceptions of the impact of blended learning on teaching and learning content. Thus, the questionnaire focused on ten themes related to blended learning, namely: Student preferences, student satisfaction, quality of the course content, Student engagement in the course, Classroom Interaction, Resources used in the course, Assessment, Use of technology, eLearning Management System (LMS), and Course instructor. The questionnaire utilized a 5-point Likert scale extending from extremely agree disagree (1) to extremely agree (5). It is worth

noting that the questionnaire went through all the ethical considerations set up by the UAE University research ethics committee.

4.2.2 Data analysis

SPSS 28.0 was used for data analysis using (1) independent-sample t-test to answer the first three questions tackling differences between students' perception of their preference and satisfaction of BL, utilization of BL for learning, and utilization of BL for teaching. In addition, an analysis of variance (ANOVA) was used to determine any significant differences between participants' perceptions of BL due to their academic level, computer skills, and the number of hours they spend using the Internet.

5 RESULTS AND DISCUSSION

Findings in Response to Research Question 1: What are the key differences between student preferences for blended learning versus traditional learning?

An independent-sample t-test was used to compare the differences between the two groups. Six items were under students' preference, and fourteen were under learner satisfaction. The delivery method had no significant impact on the students' preferences and satisfaction, but the results showed that learner satisfaction was slightly more impacted than the student's preferences.

Upon further investigation, it was seen that in terms of student preferences, there was a significant difference between the two groups in two elements out of fourteen. As shown in Table 1 below, the first indicates that the students who had previously experienced blended learning courses favored the blended learning delivery method more than those who did not. Second, the findings indicate that the students who had previously experienced blended learning cared more about the course instructor and the materials than the delivery method. This leads to the conclusion that the students enrolled in a blended learning course picked the course for the delivery method because the



materials and instructors used in blended learning were seen as better. The quality of the materials provided in blended learning courses is discussed further as part of the answer to question number 2.

Regarding differences in the reported satisfaction levels between the two groups, two elements presented very similar responses, and four elements showed noticeable differences. Unlike most studies that emphasized the increased flexibility of blended learning offers over traditional methods, our results showed that both groups felt that they had a great sense of flexibility. In addition, both groups felt the same level of comfort in disagreeing with other course participants. On the other hand, the students involved in blended learning courses felt that the availability of course materials, communication, and assessment tools enriched their learning more than those who experienced traditional courses. They also felt that the delivery method made it easier for them to learn the content, enjoy the process, and feel more comfortable participating in the course discussions.

Table 1

Differences Between the Preference and Satisfaction of Students Due to the Type of Delivery Method.

Item	Mean BL.	TL	t.
Student preferences			
I would always choose to take a blended course over a traditional course if it was available	4.2	3.6	3.5**
I prefer to have the recorded lectures online before the face-to-face class	4.0	3.8	0.7
When registering for the class, I consider course instructor and materials rather than a method of instruction (Blended versus traditional)	4.0	3.3	3.0*
I prefer online discussions rather than face-to-face	4.0	3.9	0.9
I feel more comfortable asking for help from an instructor online than face-to-face	3.8	3.5	1.1
I learn better when studying course materials online compared to face-to-face	3.5	3.5	.462
Total	4.0	3.6	2.2*
Student satisfaction			
Reflection on course content and discussion helped me understand the fundamental concepts in this course	4.3	3.9	2.4
The availability of course materials, communication, and assessment tools helped me improve my learning	4.3	3.8	3.1
Blended courses made it easier for me to learn the content	4.3	3.9	3.0
Overall, I am satisfied with this blended learning course	4.3	3.9	2.1
Registering for a blended course allowed more flexibility in my schedule	4.2	4.1	1.0



I enjoyed learning in this learning environment	4.2	3.8	2.8
I felt motivated to explore course content online	4.2	3.9	2.2
I felt a sense of satisfaction and achievement about this Blended learning environment	4.1	3.8	2.0
Studying course materials using blended learning was easier	4.1	3.9	1.2
I felt comfortable participating in course discussions	4.1	3.8	2.5**
I felt my point of view was acknowledged by the instructor and the students	4.1	3.9	1.4
I would like all my other courses to be taught as blended courses	4.0	3.7	2.3
I learned more in Blended learning courses compared to the traditional courses	4.0	3.6	2.3
I felt comfortable disagreeing with other course participants while still maintaining a sense of trust	3.9	3.8	0.5
Total	4.2	3.8	2.9**

The findings presented in Table 1 answer the first research question by revealing the differences between student preferences and satisfaction due to the type of delivery method (blended learning versus traditional learning). The table shows the mean and t-values for each item. The items are divided into two categories: student preferences and student satisfaction. The table shows significant differences between the preferences and satisfaction of students due to the type of delivery method. The items with asterisks (*) indicate that the differences are significant at the 0.05 level, while those with double asterisks (**) indicate that the differences are significant at the 0.01 level.

The results of the current study seem to align with and contribute to the broader body of research on blended learning. Here are some commonalities and differences between our findings and those from other studies:

First, Flexibility Perception: The current study found that both groups (blended learning and traditional learning) felt great flexibility, challenging the common belief that blended learning inherently offers more flexibility. This is interesting because it contrasts with the emphasis on increased flexibility often associated with blended learning. *Second, Student Preferences:* Similar to our findings, other studies, such as Hussain *et al.* (2019), emphasized the importance of student preferences and active involvement in the learning process in blended learning scenarios. *Third, Material Quality and Instructor Role:* Our study highlighted that students in blended learning cared more about the course instructor and materials than the delivery method itself. This aligns with the emphasis on the quality of materials in blended learning, as discussed in studies like Poon (2013). *Fourth, Satisfaction Levels:* The differences in satisfaction levels between groups in our study, mainly related to course





materials, communication, and assessment tools, resonate with findings in other studies that highlighted the positive impact of blended learning on student engagement and satisfaction (e.g., Tong *et al.* (2022). *Fifth, Challenges:* Our study and the broader literature acknowledge challenges associated with blended learning, such as the need for new teaching skills and significant investment in technology and training. *Sixth, Geographical Scope:* Our study seems to be part of a broader trend in research (Spring *et al.*, 2016a, 2016b, 2017) to understand blended learning across various worldwide regions, addressing a potential limitation in the geographical scope of earlier studies. *Seventh, Blended Learning Models:* Other studies, such as Tong *et al.* (2022), also explored the efficacy of specific blended learning models (e.g., flex model) and their impact on academic performance and student attitudes.

It is worth noting that blended learning research is diverse, and individual studies contribute to the overall understanding of how this approach impacts education. The variations in findings across studies highlight the nuanced nature of blended learning and its effects on student preferences and satisfaction.

Findings in Response to Research Question 2: What are the key differences between student perceptions of utilizing blended learning versus traditional learning?

A t-test method was used to compare the differences between the two groups. Students' perceptions were measured in five main learning categories. The results showed a significant difference between the two groups' opinions of course quality. Students' perception of the assessment for their learning was least affected by the delivery method as the means were relatively close in all its elements between the two groups. The results of each category are discussed thoroughly below.

The quality of the course was measured across twelve elements. Looking at the elements in Table 2, there are four elements where a significant difference between the two groups occurs as the t-value ranged between 3.3 and 4.1. Students who experienced blended learning felt that the assignments and projects were more related to real life, the assignment expectations were clearer, online course activities were more enjoyable, and the learning



environment was more fun than those courses delivered in a traditional method. On the other hand, both groups felt that the activities in their courses were carefully planned. They also agreed that the presentation of the course content online was more straightforward than face-to-face.

The students' engagement in the course category comprised four elements. The difference between the two groups was not as significant as it was for the quality of the course. However, the element with the highest level of difference out of the four elements was the ease of engagement measure for the course. Students who experienced blended learning felt that it was easier to engage than those who experienced traditional learning. However, both groups developed a sense of belonging in their courses. The 'interaction' category comprised nine elements in total. This category showed no significant difference between the two groups. However, the students involved in blended learning felt that it regulated self-learning slightly more effectively than those who experienced face-to-face learning. The 'resources used' in the course comprised three elements. The difference was as significant as the students' engagement in the course category. Students who experienced blended learning reported more positive about the course materials and felt that having the materials online improved their learning. Lastly, 'assessment' was the final category with three elements. There was no significant difference between the two groups. The element with a considerable difference rate was having their grades updated online. The students in blended learning perceived this element as more helpful in improving their performance than those in traditional courses.

**Table 2***Differences Between Student Perceptions of the Utilization of Blended Learning for Learning Content based on the Type of Delivery Method*

Item	M. BL.	TL	t.
Quality of the course content			
The combination of face-to-face and online sessions was helpful and meaningful	4.3	3.9	2.6
The learning objectives were clearly stated in each lesson	4.2	3.8	2.4
Assignment expectations were clearly stated	4.2	3.7	3.4
Course activities were exciting and fun to do online	4.2	3.6	4.1
Assignments and projects, I worked on dealing with real-life situations	4.2	3.7	3.3
The instructions for the online activities were clear and understandable	4.2	4.0	2.1
The structure of the environment kept me focused on what was to be learned	4.1	3.7	2.3
There was a good balance between online and classroom activities	4.1	3.8	2.4
The blended learning environment was engaging throughout the course	4.2	3.6	4.1**
Activities were planned carefully	4.1	4.0	1.0
The online discussion helped me develop a sense of collaboration	4.0	3.8	1.3
The presentation of the course content online was more straightforward than face-to-face	3.8	3.5	1.5
Total	4.1	3.8	3.4**
Student engagement in the course			
I found it easy to engage myself successfully in the course	4.3	4.0	2.5
I felt comfortable participating in course discussions	4.3	4.0	2.1
Blended learning enabled me to become more engaged in the learning process	4.2	4.0	1.7
I developed a sense of belonging in the course	4.2	4.0	1.6
Total	4.3	4.0	2.1*
Classroom Interaction			
Online communication was an excellent medium for social interaction	4.3	4.0	1.9
Blended learning helped me interact better with classmates and with the instructor asynchronously	4.2	3.9	1.9
The interaction in learning as a result of face-to-face learning and online increased my motivation.	4.2	3.9	1.8
It was easy to organize a group for a project.	4.2	3.9	2.2
Blended learning promotes self-regulated learning.	4.2	3.8	2.5
I was able to know my classmates better in this course	4.1	3.9	1.7
I felt comfortable interacting with other course participants.	4.1	3.7	2.4**
I had more communication with the instructor online.	4.0	3.8	1.7
I communicated a lot with my classmates online.	4.0	3.6	2.2*
Total	4.1	3.8	1.9
Resources used in the course			
Sufficient resources for this blended course were provided.	4.2	3.8	2.7
The availability of course materials online helped me improve my learning.	4.2	3.9	2.5
Communication tools in this course (e.g., wikis, discussion forums, and blogs) were beneficial.	4.1	3.9	1.5
Total	4.2	3.9	2.1*
Assessment			
Having my grades updated on the system helped me to keep track of my performance in the course	4.4	3.9	2.8
Feedback was provided at a good timing	4.2	4.0	1.5



It was easier to do quizzes and exams online	4.1	3.9	1.7
Total	4.2	3.9	1.6

The next area of investigation revealed differences between student perceptions of utilizing blended learning for learning content based on the type of delivery method. The items are divided into three categories: Quality of the course content, student engagement, and classroom interaction. The table shows the mean and t-values for each item. The items with asterisks (*) indicate that the differences are significant at the 0.05 level, while those with double asterisks (**) indicate that the differences are significant at the 0.01 level.

A t-test method was used to compare the differences between the two groups. We focused on three main teaching categories: the Use of Technology, the eLearning Management System, and Course instructor. The results showed no significant difference between the two groups on how the students perceived the three categories based on the delivery method.

As seen in Table 3, the students' overall perception of the three categories was not significantly related to the delivery method, as both groups showed relatively close results. However, when responses were explored further, there was an element with a t-value of 2.6 out of 5, which is relatively above average. This means it was slightly influenced by the delivery method. This element was the instructors' attention to individual differences. The students who took blended learning courses felt that the instructor was more considerate of their learning style than those who took traditional courses.

For the use of technology category, students found completing the course assignments online convenient ($M=4.3$) and had the right skills to deal with the online tools in the blended class ($M=4.2$). The organization of the online lessons was easy to follow ($M=4.1$), and getting technical support was easy to get at any time ($M=4.1$). However, technology problems affected their performance in the blended course ($M=3.6$).

For the eLearning Management System (LMS) category, students found the eLearning system used for this course appealing and attractive ($M=4.2$), well-designed ($M=4.1$), and easy to navigate through ($M=4.0$).

For the course instructor category, students found that the course instructor helped keep students engaged with the course materials ($M=4.3$),



encouraged students to work together online ($M=4.3$), encouraged them to learn in different ways ($M=4.3$), communicated important course topics ($M=4.2$) and goals ($M=4.2$) clearly, helped them learn course topics easily ($M=4.2$), helped keep students on tasks in a way that helped them learn ($M=4.2$), helped focus discussion on relevant issues in a way that helped them learn ($M=4.2$), and helped in developing a sense of community among students ($M=4.2$). However, the course instructor was not always prepared and available to answer their questions ($M=4.2^*$) and focused on their work during class time ($M=4.2$).

Our study adds valuable insights into the differences in student perceptions based on the delivery method, aligning with and extending findings from various other studies on blended learning. Let's break down some key points: First, Course Quality: Our study indicated a significant difference in the perception of course quality between blended and traditional learning. Elements like the relevance of assignments to real life, clarity of assignment expectations, enjoyable online activities, and a more fun learning environment were rated higher by students in blended learning. *Second, Student Engagement:* The ease of engagement was highlighted as the element with the highest level of difference between the two groups. Students in blended learning found it easier to engage compared to those in traditional learning. Both groups, however, developed a sense of belonging in their courses. *Third, Interaction:* While no significant difference was found in the overall interaction category, students in blended learning felt that it regulated self-learning slightly more effectively than face-to-face learning. Fourth, Resources Used: Blended learning students reported more positively about course materials and believed that having materials online improved their learning. This aligns with the idea that online resources can enhance the learning experience.

In addition, here are some other points: Fifth, assessment: No significant difference was found in the overall assessment category, but there was a considerable difference in the perception of having grades updated online. Blended learning students perceived this as more helpful in improving their performance. Sixth, Teaching Categories: Overall, there was no significant difference in the perception of the use of technology, eLearning Management



System (LMS), and course instructor based on the delivery method. However, the attention to individual differences by instructors was rated higher by students in blended learning. Seventh, Technology Use: Blended learning students found completing course assignments online convenient and had the right skills to deal with online tools. However, technology problems affected their performance in the blended course. Eighth, Overall Student Perception: The students' overall perception of the three teaching categories was not significantly related to the delivery method. However, the delivery method slightly influenced the attention to individual differences among instructors.

Our study's findings complement existing literature on blended learning, adding granularity to our understanding of how different aspects of the learning experience are perceived by students. The positive aspects highlighted, such as the relevance of assignments and instructor attention to individual differences, contribute to the ongoing conversation about the benefits and challenges of blended learning.

Table 3

Differences Between Student Perceptions of the Utilization of Blended Learning for Teaching Content based on the Type of Delivery Method

Item	M.		t.
	BL.	TL	
Use of technology			
Completing the course assignments online was convenient for me.	4.3	4.0	1.9
I had the right skills to deal with the online tools in the blended class	4.2	3.9	2.3
The organization of the online lessons was easy to follow	4.1	4.1	0.5
I got the technical support I needed during the blended learning course	4.1	3.9	1.4
Getting technical support was easy to get at any time	4.1	4.0	0.7
Technology problems affected my performance in the blended course	3.6	3.7	-.6
Total	4.1	3.9	1.2
eLearning Management System (LMS)			
The eLearning system used for this course was appealing and attractive	4.2	3.8	2.2
The eLearning system used for this course was well-designed	4.1	3.8	2.3
The eLearning system used for this course was easy to navigate through	4.0	3.8	1.5
Total	4.2	3.9	1.6
Course instructor			
the instructor helped keep students engaged with the course materials	4.3	3.9	2.4
the instructor encouraged students to work together online	4.3	4.0	1.7
the instructor encouraged me to learn in different ways	4.3	4.0	2.0
the the instructor communicated important course topics clearly	4.2	3.9	2.4
the instructor communicated important course goals clearly	4.2	3.9	1.5
the instructor helped me learn course topics in an effortless manner	4.2	3.9	1.8
the instructor helped keep students on task in a way that helped me learn	4.2	4.1	0.7



the instructor helped focus the discussion on relevant issues in a way that helped me learn	4.2	4.0	1.2
Course instructor actions helped in developing a sense of community among students	4.2	3.9	1.8
the instructor was prepared and available to answer my questions	4.2	3.9	2.2*
the instructor focused on our work during class time	4.2	3.9	2.1*
the instructor expected me to do my best	4.2	3.9	1.9
the instructor respected my way of learning	4.2	3.8	2.6
the instructor helped guide the class toward understanding course topics	4.2	3.9	1.9
the instructor encouraged students to explore new concepts in the course	4.1	4.0	1.0
the instructor gave me quick comments on my work	4.1	3.9	2.2
the instructor provided clear instructions on how to participate in the course activities	4.1	3.9	1.6
the instructor clearly communicated important due dates for the activities	4.1	3.9	1.5
the instructor provided feedback that helped me understand my strengths and weaknesses regarding the course objectives	4.1	4.0	1.0
Total	4.1	4.0	1.2

Findings in Response to Research Question 3: What are the key differences between student perceptions towards blended learning due to their level, computer skill, and number of hours using the Internet?

A one-way ANOVA was conducted to investigate the effect of three independent variables on the student's perception of utilizing blended learning. An analysis of variance showed that only one of the three variables significantly affected students' perceptions of utilizing blended learning. Namely, the students' computer skills (beginners, intermediate, and advanced), while the other two variables did not significantly affect students' perceptions.

As seen from Table 4, the analysis of variance of the academic level (first year, second year, third year, and fourth year) on perceptions was insignificant, $F(3,124) = 0.685$, $p = 0.563$. Similarly, the analysis of variance of the Number of Hours Using the Internet (0-1 hour, 1-2 hours, 2-3 hours, and more than 3 hours) on perception was not significant ($3,124 = 1.040$, $p = 0.377$).

On the other hand, the analysis of the variance of computer skills (Beginners, Intermediates, and Advanced) on perception was significant ($2, 124 = 4.783$, $p = 0.010$). A post hoc analysis was run to determine the source of this significance. Results of the post hoc Tukey test showed that the significant difference was between students' who were intermediate (mean score of 3.86) and those students who were advanced (mean score of 4.26) at



$p. < .010$. On the other hand, the beginners' computer-skill group was not significantly different from the other two groups (mean = 3.992).

Table 4

Results of the One-way ANOVA of Students' Perceptions of the Utilization of Blended Learning based on their Academic Level, Number of Hours using the Internet, and Computer Skills.

ANOVA: Academic Level					
Perception	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4956.456	3	1652.152	.685	.563
Within Groups	318515.360	124	2412.995		
Total	323471.816	127			
ANOVA: Hours Using the Internet					
Perception	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.205	3	.402	1.040	.377
Within Groups	50.599	124	.386		
Total	51.805	127			
ANOVA: Computer Skill					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.478	2	1.739	4.783	.010
Within Groups	48.352	124	.364		
Total	51.830	126			

Table 4 shows the results of the one-way ANOVA of students' perceptions of the utilization of blended learning based on their academic level, number of hours using the Internet, and computer skills. The table shows the sum of squares, degrees of freedom, mean square, F-value, and significance level for each ANOVA.

For the ANOVA based on academic level, the F-value is 0.685, and the significance level is 0.563, indicating no significant difference in students' perceptions of the utilization of blended learning based on their academic level.

For the ANOVA based on hours using the Internet, the F-value is 1.040, and the significance level is 0.377, indicating no significant difference in students' perceptions of the utilization of blended learning based on the number of hours they use the Internet.



For the ANOVA based on computer skills, the F-value is 4.783, and the significance level is 0.010, indicating a significant difference in students' perceptions of utilizing blended learning based on their computer skills.

The results of the current study are well-organized and provide a comprehensive overview of the one-way ANOVA findings, connecting them effectively with the broader context of blended learning research. In summary, the following key points appear: First, Results of One-way ANOVA: The study investigated three independent variables: academic level, hours using the Internet, and computer skills. Only computer skills significantly affected students' perceptions of blended learning. Second, ANOVA Results for Each Variable: Academic level and hours using the Internet did not significantly affect perceptions. At the same time, computer skills had a significant effect (F-value = 4.783, $p = 0.010$). Third, Post Hoc Analysis (Tukey Test): A significant difference was found between students with intermediate and advanced computer skills, while the beginners' computer skills group was not significantly different from the other two groups.

When the reader analyzes the results, connections to previous studies appear as follows: First, Overview of Blended Learning: The overview defines blended learning as a mix of face-to-face and online instruction. It highlighted its potential to transform higher education by providing flexibility and engagement. Second, Benefits and Challenges: Discussed benefits (flexibility, convenience, personalized learning) and challenges (implementation difficulties, need for new skills). Third, Best Practices: Outlined best practices for successful implementation in higher education. Fourth, Growth in Research: Mentioned the rapid increase in research on blended learning, citing studies examining various aspects. Fifth, Global Perspective: Highlighted studies that explored blended learning across different regions, addressing a limitation in previous research.

On the other hand, here are some specific studies that have specific connections with the current study:

1. Hussain *et al.* (2019): a) Qualitative study on practices and problems associated with blended learning in higher education. B) Emphasized support for in-person instruction with online resources;



2. Tong *et al.* (2022): a) Explored the efficacy of the flex model of blended learning in teaching coordinates in mathematics. B) Positive impact on academic achievement, self-study abilities, and learning attitudes;
3. Rifai & Sugiman (2018): a) Evaluated seventh-grade students' opinions of mobile blended learning in mathematics. b) Students had a favorable opinion of mobile-integrated learning;
4. Hass's qualitative study (2022) focused on AP classroom procedures, using art and group work to improve students' understanding of literary elements;
5. Other Research Studies: Mentioned studies on the Flipped Classroom Approach, technology-supported professional growth for math teachers, technology-mediated practices in mathematics classrooms, and a descriptive survey study on secondary school students' experiences.

In summary, the integration of the results of the current study with previous studies strengthens the context of our research study and provides a well-rounded understanding of the blended learning landscape.

6 CONCLUSION

To conclude, based on the evidence from the data obtained in this study, the blended learning approach's overall effectiveness compared to the traditional teaching approach was positive for students. Most studies reviewed as part of the literature review for this study are consistent with the results presented, demonstrating that students respond positively to the blended learning model. They believe that they gained a greater sense of control and feel more motivated, and overall recommend full implementation of the blended learning format in their studies across all of their courses.

According to the results of this study, blended learning can promote enhanced learning skills, active involvement in learning, and a sense of self-regulated learning. The study also demonstrates that blended learning potentially enhances students' motivation, leading to better academic performance. Students showed enthusiasm for blended learning. This social enhancement aspect highlighted the positive role of collaborative strategies in



learning. The research findings support Vygotsky's theory that knowledge can be constructed, providing greater learning benefits.

To summarize, blended learning is a pedagogical approach combining the online delivery of learning and instruction with student control over time, place, path, and pace. Blended learning may increase learning effectiveness, satisfaction, and efficiency, as well as student access and flexibility to higher levels of information and learning skills. In addition, it may facilitate increased enrollment and enhanced use of physical facilities by requiring less seat time than fully face-to-face courses (BatdÄ, V. (2014).

Finally, this study aimed to shed light on blended learning in higher education in the United Arab Emirates to encourage students to become more engaged by incorporating personalized and meaningful learning.



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