

***Investigating Nursing Students' Perspectives on Blended Learning at
Cairo University, Egypt***

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Abstract

Background and Purpose: Blended learning, which combines traditional face-to-face classrooms with online learning, has gained increasing attention in higher education. This study aimed to investigate nursing students' perspectives on blended learning, in addition to the potential benefits and challenges of implementing blended learning in nursing education.

Methods: A cross-sectional study was used to target nursing students enrolled at the final year at the Technical Institute of Nursing affiliated to Cairo University during the first semester of the academic year 2023/2024. An online questionnaire was completed by 221 students.

Results: The majority of the students (81%) expressed a positive attitude towards blended learning after the COVID-19 pandemic. The top three aspects of blended learning that students found most beneficial were opportunities for collaboration with peers (52.1%), flexibility in learning (50.4%), and improved interaction with instructors (49.6%). However, technical difficulties (50.4%) were reported as the primary challenge. There were statistically significant associations between the students' attitudes towards blended learning and the frequency of attending face-to-face classes in a typical week ($p=0.011$), their comfort level with using technology for learning ($p<0.001$), and their satisfaction with previous blended learning experience ($p=0.007$).

Conclusion

Despite the predominantly positive attitudes towards blended learning among nursing students, it is crucial to address the challenges of technical difficulties and effective time management. Educators and administrators should provide additional training and support for students in the use of blended learning technologies to ensure a smooth learning experience.

Keywords: Blended learning; nursing education; online; Egypt

Introduction

Blended learning, a rapidly growing approach in higher education, combines online and in-person learning to enhance student learning outcomes and engagement, especially during the COVID-19 pandemic (*Singh et al., 2021*). The pandemic has compelled educational institutions to swiftly adopt online and blended learning models, making blended learning crucial for nursing education during these challenging times. Blended learning has been proven to improve academic performance,

increase student satisfaction, and offer greater flexibility in learning (*Kaoud et al., 2021*). Previous research has indicated that blended learning has the potential to enhance students' knowledge, skills, and clinical competencies (*El Sadik and Al Abdulmonem, 2021*). However, there is also evidence suggesting that implementing blended learning in education can pose challenges, such as limited access to technology and resistance to change from educators and students (*Almahasees et al., 2021*). The implementation of blended learning in nursing education is a relatively new field of study, there is limited evidence on its effectiveness and potential challenges in Egypt. Currently, only a few studies have explored nursing students' attitudes towards different learning management systems in Egypt, and the perspectives of Egyptian nursing students on blended learning have not been addressed to the best of the researchers' knowledge (*Mousa et al., 2022*). Consequently, there is a need to investigate the potential benefits and challenges of incorporating blended learning in nursing education in Egypt. This study aims to bridge this gap by exploring nursing students' perspectives on blended learning at Cairo University, examining the impact of the COVID-19 pandemic on their attitudes towards this approach and to identify the potential benefits and challenges of implementing blended learning in nursing education.

Volunteers and Methods

Study Design, Setting, and Participants:

A cross-sectional study design was used to target nursing students enrolled at the second year (final year) at the Technical Institute of Nursing affiliated to Cairo University during the first semester of the academic year (2023/2024).

Sample size and technique:

The sample size was estimated by using Epi Info program, version 7. Based on the findings of the study conducted by *Atwa et al (2022)* where the positive attitudes towards blended learning was estimated to be 17.5% among medical students and by employing: 95% confidence interval, limit of precision of 5%, with a design effect of 1.0 and the total number of the nursing students registered at the final year at the Technical Institute of Nursing (263 students), the calculated sample size was 121 participants. A convenient sampling technique was utilized to select participants. Inclusion criteria of the participants were as following: (1) currently enrolled at the second year (final year), (2) have completed at least one blended learning course, and (3) willing to participate in the study. Participants who didn't not meet these criteria were excluded from the study.

Data Collection Tool:

Data were collected from participants by using an online Arabic anonymous questionnaire with close-ended questions. The questionnaire employed in this study was adapted from surveys used in previously published work (*Almendingen et al., 2021; Han and Ellis, 2020; AlZumor et al., 2013*). The questionnaire included three sections: (1) demographic information, (2) perceptions of blended learning, and (3) attitudes towards blended learning in the context of COVID-19.

Pilot testing:

A pilot study was conducted with a sample of 20 students to assess the comprehensibility, clarity, and completion time of the preliminary questionnaire. Based on the feedback received, necessary modifications were made to enhance conciseness and eliminate redundant items, resulting in the final version of the questionnaire.

Procedures and Ethical considerations:

Participants were recruited for the study using an online Google form, following approval from the Research Ethics Committee at the Faculty of Medicine, Cairo University (N-337-2023), as well as obtaining all necessary administrative permissions. The questionnaire used in the study ensured participant anonymity, with all data being coded to protect confidentiality. Furthermore, data access was restricted to the research team and securely handled by the principal investigator. The study procedures adhered to the ethical guidelines outlined in the Declaration of Helsinki.

Statistical analysis:

The pre-coded data were subjected to statistical analysis using SPSS software (version 21). Descriptive statistics, including frequencies and percentages, were employed to summarize and analyze the data. Inferential statistics, specifically chi-square tests, were utilized to assess relationships between variables. A significance level of $p \leq 0.05$ was considered statistically significant.

Results

Out of the total sample size of 121 students, nearly two thirds were males (59.5%) compared to females (40.5%). In terms of age, the majority of students fell within the 21-23 age group (89.3%), followed by the 18-20 age group (10.7%). Regarding their attendance in face-to-face classes, the majority of students reported attending 3-4 times a week (60.3%), followed by attending 1-2 times a week (30.6%). Notably, 9.1% of the participants reported attending every day and none of the students reported never attending face-to-face classes. In terms of the frequency of online classes attendance in a typical week, the majority of students reported attending 3-4 times a week (61.2%), followed by attending 1-2 times a week (33.1%). Only 5% of the students reported attending online classes every day. Regarding their comfort with using technology for learning, the majority of students reported feeling comfortable (60.3%). While more than one third of students reported feeling neutral (19.8%) or uncomfortable (19.8%) with using technology for learning (**Table 1**).

Table 1:

Background characteristics of the nursing students at the Technical Institute of Nursing, Cairo University (n=121)

Tested variables	Category	Number	Percent (%)
Age (years)	18 – 20	13	10.7
	21-23	108	89.3
Gender	Males	72	59.5
	Females	49	40.5
Face-to-face classes in a typical week	1-2 times a week	37	30.6
	3-4 times a week	73	60.3
	Every day	11	9.1
Online classes in a typical week	Never	1	0.8
	1-2 times a week	40	33.1
	3-4 times a week	74	61.2
	Every day	6	5
How comfortable are you with using Technology technology for learning?	Comfortable	73	60.3
	Neutral	24	19.8
	Uncomfortable	24	19.8

Table 2 displays the perspectives of nursing students on blended learning at the Technical Institute of Nursing, Cairo University. In terms of their satisfaction with previous blended learning experiences, nearly half the students reported being satisfied (47.1%), while the other half expressed neutrality (36.4%) and dissatisfaction (16.5%). Regarding the aspects of blended learning that students found most beneficial, the top three identified by the students were opportunities for collaboration with peers (52.1%), flexibility in learning (50.4%), and improved interaction with instructors (49.6%). Other aspects such as improved academic performance (47.9%), access to learning materials (43.8%), enhanced clinical competencies (38.8%), and self-directed learning (3.3%) were also highlighted by the students. On the other hand, when asked about the most challenging aspects of blended learning, students reported technical difficulties (50.4%) as the primary challenge. Other challenges included managing time effectively (45.5%), maintaining motivation (43.8%), and resistance to change (33.9%). Feeling isolated from others (32.2%) was reported as a less significant challenge by the students.

Table 2:

Nursing students' perspectives on blended learning at the Technical Institute of Nursing, Cairo University (n=121)

Tested variables	Category	Number	Percent
How satisfied were you with your previous blended learning experience?	Satisfied	57	47.1
	Neutral	44	36.4
	Dissatisfied	20	16.5
What aspects of blended learning do you find most beneficial?*	Opportunities for collaboration with peers	63	52.1
	Flexibility in learning	61	50.4
	Improved interaction with instructors	60	49.6
	Improved academic performance	58	47.9
	Access to learning materials	53	43.8
	Enhanced clinical competencies	47	38.8
	Self-directed learning	4	3.3
What aspects of blended learning do you find most challenging?*	Technical difficulties	61	50.4
	Managing time effectively	55	45.5
	Maintaining motivation	53	43.8
	Resistance to change	41	33.9
	Feeling isolated from others	39	32.2

*More than one response was allowed

Table 3 illustrates the perspectives of nursing students towards the learning process after the COVID-19 pandemic at the Technical Institute of Nursing, Cairo University. Approximately one third of the students (33.9%) reported a worsened learning experience after the COVID-19 pandemic, while nearly one third reported no change (28.1%) and one third reported an improved learning experience (38%). In terms of access to learning resources, the majority of students reported that their access had improved (58.7%), while a smaller percentage reported no change (25.6%) and a few reported that their access had worsened (15.7%). When asked about the impact of the pandemic on their interaction with instructors and peers, 37.2% of the students reported a worsened interaction, whereas 35.5% reported an improved interaction, and 27.3% reported no change. Furthermore, approximately half of the students (45.5%) reported an improved motivation towards learning due to the pandemic, while a smaller percentage reported no change (38%) and a few reported a worsened motivation (16.5%). In terms of managing time effectively, more than half of the students (50.4%) reported improvement, while approximately one quarter reported no change (25.6%), and the remaining quarter reported a worsened ability to manage time (24%). Finally, when asked about the impact on their mental health, more than one third of the students reported that their mental health had worsened (38.8%), and a nearly equal portion reported no change (37.2%) and a few reported that their mental health had improved (24%).

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The perspectives of the nursing students towards the implementation of blended learning in nursing education after the COVID-19 pandemic are summarized in table (4). In response to the question of whether blended learning is important in the context of nursing education after the pandemic, the majority of students (81%) expressed a positive attitude, while a smaller proportion remained neutral (14%) and a few had a negative perspective (5%). Regarding the recommendation of blended learning to other nursing students, a noteworthy percent of participants (62%) indicated a positive recommendation, while a smaller percent remained neutral (26%) and a limited proportion expressed a negative recommendation (11.6%). When asked about potential improvements for blended learning in nursing education, the most commonly suggested aspects were more training for educators and students (72.7%), followed by the need for additional technical support (70.2%), and enhancing the quality of online learning materials (65.3%). Additionally, participants identified several ways in which blended learning could be improved, including improving access to technology (64.5%), providing more opportunities for collaboration with peers and instructors (52.1%), increasing face-to-face interaction (49.6%), and involving students in the design of blended learning courses (43.8%).

Table 3:

Nursing students' perspectives towards the learning process after the COVID-19 pandemic (n=121)

Tested variables	Category	Number	Percent (%)
How has the COVID-19 pandemic impacted your learning experience?	Improved	46	38
	No change	34	28.1
	Worsened	41	33.9
How has the COVID-19 pandemic impacted your access to learning resources?	Improved	71	58.7
	No change	31	25.6
	Worsened	19	15.7
How has the COVID-19 pandemic impacted your interaction with instructors and peers?	Improved	43	35.5
	No change	33	27.3
	Worsened	45	37.2
How has the COVID-19 pandemic impacted your motivation towards learning?	Improved	55	45.5
	No change	46	38
	Worsened	20	16.5
How has the COVID-19 pandemic impacted your ability to manage your time effectively?	Improved	61	50.4
	No change	31	25.6
	Worsened	29	24
How has the COVID-19 pandemic impacted your mental health?	Improved	29	24
	No change	45	37.2
	Worsened	47	38.8

Table 4:

Nursing students' perspectives towards the implementation of blended learning in nursing education (n=121)

Tested variables	Category	Number	Percent (%)
Do you think blended learning is important in the context of nursing education after the COVID-19 pandemic?	Yes	98	81
	Neutral	17	14
	No	6	5
Would you recommend blended learning to other nursing students?	Yes	75	62
	Neutral	32	26
	No	14	11.6
How do you think blended learning can be improved in nursing education?*	More training for educators and students	88	72.7
	More technical support	85	70.2
	Improving the quality of online learning materials	79	65.3
	Improving access to technology	78	64.5
	More opportunities for collaboration with peers and instructors	63	52.1
	Increasing face-to-face interaction	60	49.6
	Involving students in the design of blended learning courses	53	43.8

*More than one response was allowed

Table 5 demonstrates the association between the nursing students' attitudes towards blended learning in nursing education after the COVID-19 pandemic and some independent variables. The results indicated that there were statistically significant associations between the students' attitudes towards blended learning and the frequency of attending face-to-face classes in a typical week ($p=0.011$), their comfort level with using technology for learning ($p<0.001$), and their satisfaction with previous blended learning experience ($p=0.007$). However, no significant associations were observed between the students' attitudes and their age ($p=0.271$) or gender ($p=0.275$) or the frequency of attending online classes in a typical week ($p=0.399$).

Table 5:

Association between attitude of nursing students towards blended learning in nursing education after the COVID-19 pandemic and some independent variables (n=121)

Tested variables	Category	Attitude towards Blended Learning		P-Value*
		Positive	Negative	
		N (%)	N (%)	
Age (years)	18 – 20	12 (92.3)	1 (7.7)	0.271
	21 – 23	86 (79.6)	22 (20.4)	
Gender	Male	56 (77.8)	16 (22.2)	0.275
	Female	42 (85.7)	7 (14.3)	
How often do you attend face-to-face classes in a typical week?	1-2 times a week	24 (64.9)	13 (35.1)	0.011**
	3-4 times a week	64 (87.7)	9 (12.3)	
	Every day	10 (90.9)	1 (9.1)	
	Never	1 (100)	0 (0)	
How often do you attend online classes in a typical week?	1-2 times a week	29 (72.5)	11 (27.5)	0.399
	3-4 times a week	63 (85.1)	11 (14.9)	
	Every day	5 (83.3)	1 (16.7)	
How comfortable are you with using technology for learning?	Comfortable	68 (93.2)	5 (6.8)	<0.001**
	Neutral	14 (58.3)	10 (41.7)	
	Uncomfortable	16 (66.7)	8 (33.3)	
How satisfied were you with your previous blended learning experience?	Satisfied	53 (93)	4 (7)	0.007**
	Neutral	31 (70.5)	13 (29.5)	
	Dissatisfied	14 (70)	6 (30)	

*Based on the results of chi square test, ** Significant variables at P value < 0.05

Discussion

The findings of the current study provide valuable insights into nursing students' perspectives on blended learning at Cairo University, Egypt, with a specific focus on the impact of the COVID-19 pandemic on their attitudes towards this approach. The study also identified the potential benefits and challenges of implementing blended learning in nursing education. The results of this research can guide educators and administrators seeking to optimize the use of blended learning in nursing education, particularly in the context of the COVID-19 pandemic.

The results of the current study indicate that there is a higher representation of males compared to females among the nursing students at the Technical Institute of Nursing, Cairo University. This gender distribution doesn't align with previous research that has shown a lower proportion of males in nursing programs (*Cui et al., 2021*). However, it is important to note that this gender disparity may vary across different nursing programs or countries. Regarding age distribution, the majority of students in the present study fell within the 21-23 years age group, with a smaller proportion in the 18-20 age group. These findings reflect the typical age range of students enrolled in the final year of nursing programs, where students are likely to be in their early twenties.

This is consistent with the age distribution reported in a similar study conducted in nursing education setting in Nepal (*Thapa et al., 2021*).

When examining the attendance patterns in face-to-face classes, the majority of students reported attending 3-4 times a week, followed by 1-2 times a week. Noteworthy, none of the students reported never attending face-to-face classes, suggesting a high level of engagement in traditional classroom-based learning. These attendance patterns may be influenced by the curriculum requirements of the nursing program.

In terms of online classes attendance in the current research, the majority of students reported attending 3-4 times a week (61.2%), followed by 1-2 times a week (33.1%). These findings indicate a considerable level of involvement in online learning activities. The COVID-19 pandemic has undoubtedly influenced the delivery of education, necessitating the incorporation of online components in nursing education to guarantee the continuity of learning (*Tayyib et al., 2021*). The frequency of online class attendance reported in this study indicates the nursing students' adaptation to the blended learning approach that started mainly during the pandemic. Regarding the students' comfort with using technology for learning, this study showed that the majority of students reported feeling comfortable, while approximately one third reported feeling either neutral or uncomfortable. These findings highlight the variability in students' technological competencies and mindsets towards technology. It is essential to consider students' comfort levels and provide adequate support to enhance their digital skills in using technology for learning (*Masadeh et al., 2023*).

In terms of satisfaction with previous blended learning experiences, the current study revealed that nearly half of the students reported being satisfied. However, a considerable proportion expressed neutrality or dissatisfaction. These findings suggest that while a significant number of students have had positive experiences with blended learning, there is room for improvement to tackle the concerns and challenges faced by other students. This matches the findings of previous research that have highlighted the importance of addressing students' satisfaction to ensure the effectiveness of blended learning (*Tayyib et al., 2023*).

Regarding the aspects of blended learning that students found most beneficial in this study, the top three identified by the students were opportunities for collaboration with peers (52.1%), flexibility in learning (50.4%), and improved interaction with instructors (49.6%). The students' acknowledgement of these benefits aligns with previous research indicating that collaborative learning, flexibility, and instructor-student interaction are key factors contributing to student satisfaction and learning outcomes in blended learning settings (*Gaffas, 2023*). Other aspects highlighted by the students in this research include improved academic performance (47.9%), access to learning materials (43.8%), enhanced clinical competencies (38.8%), and self-directed learning (3.3%). These findings reflect the potential benefits of blended learning in promoting academic achievement, facilitating practical skill development, providing resources, and fostering learner autonomy (*Pham, 2023*). On the other hand, when asked about the most challenging aspects of blended learning, about half of the students in the present study reported technical difficulties as the primary challenge. This finding underscores the significance of addressing technical issues to ensure a smooth learning experience (*Zydney et al., 2020*). Other challenges mentioned by the students included managing time effectively (45.5%), maintaining motivation (43.8%), and resistance to change (33.9%). These challenges go in accordance with the broader literature on blended learning, where time management, motivation, and change resistance are identified barriers that need to be addressed to improve student engagement (*Hanny et al., 2023; Rasheed et al., 2020*).

The results of this study indicate that the perspectives of nursing students towards the learning process after the COVID-19 pandemic at the Technical Institute of Nursing, Cairo University are mixed. The majority of students reported an improved access to learning resources (58.7%), time management (50.4%), and motivation towards learning (45.5%) due to the pandemic. However, approximately one third of the students reported a worsened learning experience (33.9%) and mental health (38.8%). These findings are consistent with previously published research on the impact of the COVID-19 pandemic on nursing education. A study by *Mojarad et al. (2023)* found that nursing students reported both positive and negative experiences with online learning during the pandemic, with some students appreciating the flexibility and convenience of the format, while others struggled with feelings of isolation and lack of engagement. Additionally, a study by *Gao et al. (2021)* found that nursing students experienced more stress and anxiety during the pandemic, which may have resulted in the worsened mental health reported in this study.

The results of the current study revealed that the majority of nursing students at the Technical Institute of Nursing, Cairo University have a positive attitude towards the implementation of blended learning in nursing education after the COVID-19 pandemic. The majority of students agreed that blended learning is important in this context, and a notable proportion would recommend this approach to other nursing students. These findings are consistent with previous research on the perspectives of nursing students towards blended learning. A study by *Janes et al. (2023)* found that nursing students had a positive attitude towards this approach, with students appreciating the flexibility and convenience of the format. Additionally, a study by *Alshawish et al. (2021)* found that nursing students who participated in a blended learning program reported increased satisfaction and engagement compared to traditional classroom-based learning.

The findings of this study also highlight the potential benefits and challenges of implementing blended learning in nursing education. The majority of students identified the need for more training for educators and students, additional technical support (70.2%), and enhancing the quality of online learning materials (65.3%) as areas for improvement. To address these challenges, it is crucial that educators and administrators provide additional training and support for students and educators in the use of blended learning technologies. This may include providing resources and technical support for students to access and engage with online learning, as well as training for educators to effectively design and provide blended learning courses. Additionally, it is recommended to engage students in the design and implementation of blended learning courses, to ensure that the needs of students are considered.

The results of this study revealed that nursing students who attend face-to-face classes more frequently in a typical week have more positive attitudes towards blended learning. This may be due to the fact that these students are more accustomed to traditional classroom instruction and may perceive blended learning as a beneficial supplement to face-to-face classes. Furthermore, nursing students who are more comfortable with using technology for learning have more positive attitudes towards blended learning, which suggests that technological competency is an important catalyst for students' attitudes towards blended learning.

Interestingly, the results of this study did not find a significant association between nursing students' attitudes towards blended learning and their gender ($p=0.2$). This finding is consistent with previous research that has found no gender differences in students' attitudes towards blended learning (*Ayasrah et al., 2022*). While the results of this study did not find a significant association between

nursing students' attitudes towards blended learning and their age ($p=0.2$), it is important to note that the age range of the participants was relatively narrow (from 18 to 23 years old).

Finally, the results of this study indicate that nursing students who have had previous positive blended learning experiences have more positive attitudes towards blended learning ($p=0.007$). This finding suggests that providing positive blended learning experiences early in a student's academic career may be an effective strategy for promoting the adoption and acceptance of blended learning in nursing education.

Conclusion and Recommendations

In conclusion, the findings of this study yielded important information and understanding regarding nursing students' perspectives on blended learning at Cairo University, Egypt, with a specific focus on the impact of the COVID-19 pandemic on their attitudes towards this approach. The majority of nursing students reported positive attitudes towards blended learning, with opportunities for collaboration with peers, flexibility in learning, and improved interaction with instructors identified as the most beneficial aspects. However, technical difficulties and managing time effectively were reported as the main challenges. The COVID-19 pandemic has influenced the delivery of education, and the frequency of online class attendance reported in this study indicates the nursing students' adaptation to the blended learning approach.

To optimize the use of blended learning in nursing education, it is recommended that educators and administrators provide additional training and support for students and educators in the use of blended learning technologies, address technical issues to ensure a smooth learning experience, and engage students in the design and implementation of blended learning courses. Providing positive blended learning experiences early in a student's academic career may be an effective strategy for promoting the adoption and acceptance of blended learning in nursing education. Furthermore, it is essential to consider students' comfort levels with technology and provide adequate support to enhance their digital skills in using technology for learning. By addressing these benefits and challenges, nursing education can better prepare students for the demands of the profession in a rapidly changing technological landscape.

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الملخص العربى

الخلفية والغرض: التعليم المدمج ، الذي يجمع بين الفصول الدراسية التقليدية وجهاً لوجه مع التعلم عبر الإنترنت ، لقي اهتماماً متزايداً في التعليم العالي. هدفت هذه الدراسة إلى استقصاء وجهات نظر طلاب التمريض حول التعليم المدمج ، بالإضافة إلى الفوائد والتحديات المحتملة لتطبيق التعليم المدمج في تعليم التمريض.

المنهجية: تم استخدام تصميم دراسة مقطعية لاستهداف طلاب التمريض المسجلين في السنة النهائية في المعهد الفني للتمريض التابع لجامعة القاهرة خلال الفصل الدراسي الأول من العام الدراسي 2024/2023. أكمل 221 طالباً استبياناً عبر الإنترنت.

النتائج: أعرب غالبية الطلاب (81%) عن موقف إيجابي تجاه التعليم المدمج بعد جائحة كوفيد-19. وكانت أهم ثلاثة جوانب من التعليم المدمج التي وجدها الطلاب مفيدة هي فرص التعاون مع الأقران (52.1%) ، والمرونة في التعلم (50.4%) ، وتحسين التفاعل مع المدربين (49.6%). ومع ذلك ، تم الإبلاغ عن الصعوبات التقنية (50.4%) كأهم تحدي. وكانت هناك علاقات ذات دلالة إحصائية بين مواقف الطلاب تجاه التعليم المدمج وتكرار حضور الحصص الحضورية في أسبوع تقليدي ($P=0.011$) ، ومستوى راحتهم في استخدام التكنولوجيا للتعلم ($P<0.001$) ورضاهم عن التعلم المدمج السابق تجربة ($P=0.007$).

الخلاصة: على الرغم من المواقف الإيجابية السائدة تجاه التعليم المدمج بين طلاب التمريض ، إلا أنه من الضروري التصدي للتحديات المتعلقة بالصعوبات التقنية والإدارة الفعالة للوقت. يجب على المعلمين والإداريين توفير تدريب ودعم للطلاب في استخدام تقنيات التعليم المدمج لضمان تجربة تعلم سلسة.