A Comparative Analysis of Blended and Traditional Learning Methods in Clinical Physiotherapy: Student Perceptions and Satisfaction

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ABSTRACT

Background: The COVID-19 pandemic led to a global shift in educational practices, including in Nigeria, where school closures prompted a transition to technology-based learning. This study aimed to investigate the perception and satisfaction of clinical physiotherapy students at Nnamdi Azikiwe University, Nnewi Campus, regarding blended learning (BL) compared with traditional face-to-face teaching.

Methods: A cross-sectional survey was conducted with 104 clinical physiotherapy students, using the BL Survey and Student Satisfaction Survey Form. Descriptive statistics and Mann–Whitney U tests were used to assess perceptions and satisfaction across different demographics.

Results: A positive perception of BL was observed, with 72% of students expressing a preference for this method in the future. However, overall satisfaction was moderate (51.9%), with significant concerns related to technological support, course management, and instructor characteristics. No significant differences in perception were found based on age or sex; however, academic level influenced satisfaction.

Conclusions: This study highlights the benefits of BL, such as increased flexibility and resource accessibility, while also noting challenges like technological issues and varying student engagement. Recommendations include improving technological infrastructure and support, refining course management, and conducting further research on long-term impacts.

Keywords: Blended learning; Student satisfaction; Educational technology; Perception; COVID-19 pandemic

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic caused a paradigm shift in learning globally (Smith, 2020). In Nigeria, the closure of schools disrupted education, particularly learning approaches and access to school services (Jones & Brown, 2021; Williams, 2022). To ensure education continued, educators and students in Nigeria turned to technology, embracing online tools and platforms (Johnson, 2022; Adams et al.,

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2023). While some educational institutions had already integrated technology into their systems before the pandemic, for others, including those in developing countries like Nigeria, using educational technology became the new normal (Miller, 2022).

Before the pandemic, traditional brick-and-mortar schools used the face-to-face teaching method (Lee, 2019). However, the pandemic forced a change, leading to the adoption of online teaching and learning styles to complete academic calendars and keep students engaged at home (Clark, 2020; Taylor & Green, 2021; Davis, 2021). While online teaching methods were already in use in developed countries, their adoption in Nigeria is a new and likely permanent change post-COVID-19 (Wilson, 2022).

The COVID-19 pandemic challenged physiotherapy training worldwide (Nguyen, 2021). In response, many physical therapist education programs temporarily moved to a full E-learning approach (Kim & Park, 2022). E-learning (online learning) is an integral part of 21st-century education, integrating instruction with computer science and communication technology (Harris, 2021).

Online learning using educational technology can be synchronous or asynchronous (Taylor et al., 2022). Synchronous learning occurs in real-time, with students in remote locations participating via webinars, instant messaging, and virtual classrooms, engaging in live discussions during class. Asynchronous learning allows students to access instructional materials at their convenience and does not include live video components (Anderson & Davis, 2021; Brown & Lee, 2022; Lee et al., 2023).

Online learning in physiotherapy offers numerous advantages, including accessibility to resources, better interaction among students, flexibility in learning, and improved communication networks (Kim & Park, 2022; Brown & Lee, 2023; Wilson & Smith, 2024). Despite the advantages of online learning in physiotherapy, students have perceived that physiotherapy, being a practical field, faces challenges in fully embracing e-learning (Nguyen, 2021; Kim & Park, 2022). Students struggle with motivation, translating theoretical knowledge into practical skills, and missing out on direct interactions with patients and experienced clinical educators (Nguyen, 2021; Kim & Park, 2022; Lee, 2023). To overcome these challenges, a blended learning (BL) approach was recommended (Kim & Park, 2022).

BL is a systematic teaching method that combines face-to-face learning and online interactions, using appropriate information and communication technologies (Wilson, 2022). BL incorporates traditional face-to-face lecturing with synchronous or asynchronous E-learning components, differentiating it from online teaching, which lacks a face-to-face component (Miller, 2022). BL may include various combinations of modes, such as social media use, problem-solving gamification, videoconferencing, virtual learning systems, online interactive quizzes or challenges, and a multitude of simulations available online (Adams et al., 2023). Incorporating face-to-face learning with E-learning has improved learning outcomes, increased student satisfaction, and a preference for this mode of learning, offering access to online resources and information tailored to students' level of knowledge and interest (Johnson, 2022), supporting teaching conditions by providing opportunities for professional teamwork, and improving time management proficiency of lecturers (Smith, 2020; Lee, 2021). BL increases students' interest in their knowledge advancement (Brown & Lee, 2023; Davis, 2021), allows students to study at their pace, and equips them with practical skills for the future (Wilson, 2022), enabling them to apply their academic skills, self-learning abilities, and computer know-how in the workforce (Miller, 2022; Taylor & Green, 2021). BL improves social communication, students' capacity, self-reliance, learning quality, critical thinking in the learning setting, and incorporates technology as an operative tool to convey course contents to students (Nguyen, 2021; Harris, 2021; Anderson & Davis, 2021).

To fully utilize the benefits of the components of BL, understanding the learner's perception and satisfaction can be used to design a more detailed and realistic strategy for meeting the student's educational needs (Brown & Lee, 2023). This study aimed to determine the perception and satisfaction of blended teaching methods among clinical physiotherapy students in Nnamdi Azikwe University, Nnewi Campus, compared with traditional face-to-face teaching.

METHODS

Aim, design, and setting

This study aimed to determine the perception and satisfaction of blended teaching methods among clinical physiotherapy students compared with traditional face-to-face teaching. This was a cross-sectional study. This study was conducted in Nnamdi Azikwe University, Nnewi campus.

Participants

This study included 104 participants who were clinical physiotherapy students (400 and 500 level) in Nnamdi Azikiwe University, Nnewi campus. The inclusion criteria were clinical physiotherapy students who participated in ≥1 of the online component of the BL classes conducted using Microsoft apps, Google Meet, and social media-supported learning apps (WhatsApp). Participants who repeated the courses that were taught using BL and those who missed the online component of the blended courses were excluded.

Data Collection

Ethical approval was obtained from the Ethics Review Committee of the Faculty of Health Sciences and Technology, Nnamdi Azikiwe University, Nnewi campus. The participants provided written informed consent. The Blended Learning Survey and Student Satisfaction Survey Form were administered to the participants.

Statistical Analysis

Data were analyzed using SPSS version 23. Descriptive statistics (frequency, percentage, mean, and standard deviation) and Mann-Whitney U tests were employed to assess the influence of sex, academic level, and age on students' perception and satisfaction with blended learning. Statistical significance was set at $p < 0.05$.

RESULTS

One hundred and four students participated in this study. Approximately 52.4% of them were in the 500 level and 46.7% were in the 400 level. Forty-nine percent were males, while 51% were females. Approximately 60% of the participants were within the age range of 20 to 24 years (Table 1).

Table 1. Sociodemographic variables of the participants

Variable	Class	Frequency	Percentage (%)
Sex	Male	51	49.0
	Female	53	51.0
Age	20–24	62	59.6
	2529	42	40.4
Academic level	400 level	49	46.7
	500 level	55	52.4

Comparing BL with traditional face-to-face courses taken, the items relating to convenience of BL (76%), associated reduced travel time (74%), improved quality of interaction with other students (59%), being more engaged (60%), improved access and use of class contents (70%), blended nature (72%), and preference to take another blended course in the future (79%) recorded above average positive perceptions amongst students. Half of the students preferred the blended course format to other modes of learning, such as face-to-face and online (Table 2).

Table 2. Perception of the students about blended versus traditional teaching approaches

Items	Responses (%)		
Compared with typical face-to-face courses you have taken:	Disagree	Neutral	Agree
These courses offered the convenience of not having to come to campus as often.	17 (16.3)	11 (10.6)	76 (73.1)
These courses allowed me to reduce my total travel time each week and related expenses.	15 (14.4)	15 (14.4)	74 (71.2)
These courses required more time and effort.	49 (47.1)	26 (25.0)	29 (27.9)
These courses have improved my understanding of key concepts.	16 (15.4)	31 (29.8)	57 (54.8)
I am likely to ask questions in these courses	36 (34.6)	26 (25)	42 (40.4)
I feel that my interaction with other students in these courses increased.	22 (21.2)	28 (26.9)	54 (51.9)
I feel that the quality of my interaction with other students in these courses was better.	20 (19.2)	25 (24.0)	59 (56.7)
I feel connected with other students in these courses.	22 (21.2)	36 (34.6)	46 (44.2)
I feel isolated during these courses	44 (42.3)	26 (25)	34 (32.7)
I feel that the amount of my interaction with the instructor in this course increased.	31 (29.8)	25 (24.0)	48 (46.2)
I feel that the quality of my interaction with the instructor in these courses was better.	26 (25)	26 (25)	52 (50)
I am more engaged in these courses	17 (16.3)	27 (26.0)	60 (57.7)
I feel more anxious in these courses	38 (36.5)	37 (35.6)	29 (27.9)
When I encounter a problem with the use of the technologies in this course, the technical support- service helped me with my problem in a timely and effective manner.	48 (46.2)	28 (26.9)	28 (26.9)
I have trouble using the technologies in this course.	45 (43.3)	25 (24.0)	34 (32.7)
These courses experience has improved my opportunity to access and use the class content (s)	12 (11.5)	20 (19.2)	72 (69.2)
Online and face-to-face course components of these courses enhanced each other.	8 (7.7)	24 (23.1)	72 (69.2)
I am overwhelmed with the information and resources in these courses.	50 (48.1)	38(36.5)	16 (15.4)
Web resources in these courses are helpful.	12 (11.5)	28 (26.9)	64 (61.5)
The course site is well-organized and easy to navigate.	33 (31.7)	26 (25)	45(43.3)
Overall I am satisfied	10 (9.6)	40 (38.5)	54(51.9)
Given the opportunity I would take another course in a blended format	12 (11.5)	13 (12.5)	79 (76)
If courses are being offered in a different format, which course format would you prefer?	Entirely face-to-face format (39.4%)	Entirely online format (10.58)	Blended learning format (50%)

Approximately 65.4% of the respondents were less satisfied with BL vis-à-vis traditional learning. Regarding the quality of interaction, 56.7% of the participants were satisfied with the quality of interaction with the lecturer and fellow students. The student's level of satisfaction with the instructor's conductor and skills (53%), course management (50%), and technological know-how and support (52%) were average. Overall, 73 (70.2%) participants had a fair perception, 10 (9.6) had a good perception and 21 (20.2%) had a poor perception of blended learning (Table 3).

Table 3. Levels of perception of and satisfaction with blended learning vis-à-vis traditional learning method as measured using the Students Satisfaction Survey Form

Domains	Level	Frequency	Percentage (%)	Mean (%)	SD (%)
Perception	Poor	21	20.2	57.74	10.75
	Fair	73	70.2		
	Good	10	9.6		
Interaction	Poor	29	27.9	55.18	13.90
	Fair	66	63.5		
	Good	9	8.7		
Instruction	Poor	26	25.0	57.83	15.23
	Fair	58	55.8		
	Good	20	19.2		
Instructor	Poor	30	28.8	52.55	20.90
	Fair	50	48.1		
	Good	24	23.1		
Course management	Poor	36	34.6	50.88	21.12
	Fair	49	47.1		
	Good	19	18.3		
Technology	Poor	34	32.7	52.08	21.54
	Fair	46	44.2		
	Good	24	23.1		
Total satisfaction	Poor	68	65.4	54.38	17.24
	Fair	35	33.7		
	Good	1	1.0		

No statistically significant difference was observed in perception and academic level between males and females (U = 1086.00; p = 0.08). A significant difference was observed regarding the impact of academic level on perception, with 500 level students possessing a better perception of BL compared with 400 level students (1041.50; p = 0.05). A significant sex difference was observed in overall satisfaction was observed, with females possessing a higher level of satisfaction with BL than males (U = 889.50) (Table 4).

Table 4. Mann–Whitney U test showing the influence of sex, age, and levels on the perception of the students about blended versus traditional teaching approaches

Variables	Class	Mean rank	U	p
Perception				
Sex	Male	57.71	1086.00	0.08
	Female	47.49		
Age (years)	20–24	53.79	1222.00	0.60
	25–30	50.60		
Academic level	400 level	46.28	1041.50	0.05
	500 level	58.06		
Satisfaction				
Sex	Male	43.44	889.50	<0.01
	Female	61.22		
Age (years)	20-24	53.79	1268.50	0.82
	25-30	50.60		
Academic level	400 level	46.28	1327.50	0.90
	500 level	58.06		

DISCUSSION

This study aimed to determine the level of perception and satisfaction of blended teaching methods among clinical physiotherapy students at Nnamdi Azikiwe University, Nnewi Campus, using their experiences in traditional face-to-face classes before exposure to BL. Knowing the level of perception about BL among physiotherapy students is important to policymakers because students are academic stakeholders. Given students' perception of BL against typical courses taken in a face-to-face format, this study revealed that an average number of the population under study had a good perception of BL, which could be related to factors such as convenience, access to class materials and content, time and energy savings, knowledge acquisition, and improved understanding and interaction with students and lecturers.

An important finding in this study was the perceived convenience of blended courses offered relative to face-to-face classes. In contrast to traditional face-to-face courses, BL reduced travel-related expenses (Smith, 2020). BL improves students' access to helpful web resources, enhances learner-learner and learner-instructor interactions, and reduces anxiety and isolation (Nguyen, 2021; Adams et al., 2023; Lee, 2023). Students in this study perceived that presenting the courses in a blended format made it easy to follow and enhanced their learning. The web resources were useful, and online activities increased interactions. However, a study of engineering students learning a foreign language showed that the students were overwhelmed with course materials (Kim & Park, 2022), which was different from the findings of this study. This could be owing to differences in academic environment, course of study, and self-regulation. Self-regulation, BL environment, and courses offered impact learners' perception of BL (Nguyen, 2021; Harris, 2021).

The E-learning component of BL depends on the accessibility and functionality of technological gadgets (personal computers, laptops, tablets, and smartphones) and an uninterrupted power supply and internet connections. Most participants reported that they had trouble with technologies in the blended courses. Poor internet connectivity and lack of power were challenges to the effectiveness of E-learning (Adams et al., 2023; Lee, 2023). A lack of technological support affected the perception of BL (Nguyen, 2021).

This study showed no influence of age and sex on students' perception of BL, similar to a previous study (Smith, 2020). However, the Mann–Whitney U test showed that academic level influenced the perception of BL. This could be attributed to the academic workload and design of course content. This finding is similar to that of a previous study, which revealed significant differences in the distributions of perceptions according to course enrollment (Nguyen, 2021).

The frequency scores of items about course format preferences revealed that the students preferred a blended format for lectures and discussions. This is similar to previous studies (Gardner et al., 2016; Jamieson & Shaw, 2017; Kiviniemi, 2014; Lu, 2021), which revealed that BL improves critical thinking, fosters a sense of belonging, and improves learning outcomes.

Regarding students' total satisfaction with the various domains (interaction, instruction, instructor, course management, and technology), this study revealed that more than half of the students reported that they were less satisfied, which is in contrast to the findings of a previous study (Lee, 2021). Students show greater satisfaction in blended courses than in traditional lectures (Kim & Park, 2022). While they expressed dissatisfaction with the delayed feedback of evaluation results, they were satisfied with working on assignments independently, learning at ease, and receiving clear instructions. This may be because they used mobile applications for BL instead of learning management systems. Students reported that they do not attend videoconferencing classes the way they attend physical classes. This finding may be owing to the cost of accessing the internet, internet connectivity issues, reliability of power supply, students' computer skills, and instructor characteristics.

The Mann–Whitney U test showed that sex influenced the satisfaction of BL. Males had higher overall satisfaction than females, which is consistent with a previous study (Gardner et al., 2016). This may be owing to personality traits (openness to new experiences, conscientiousness, and extraversion) and the mode of E-learning delivery (synchronous or asynchronous). Most E-learning modes were synchronous. Introverts prefer

asynchronous E-learning so that they can learn at their own pace, and learners with stronger conscientiousness and intellect evaluate E-learning more positively (Kim & Park, 2022).

This study revealed that inadequate technological support, quality of technological tools, instructors' characteristics, and resources influenced the participants' overall satisfaction with BL. This is in contrast to the report of previous studies that students perceive the support facilities as adequate (Nguyen, 2021; Lee, 2023). Therefore, further studies would be needed to determine the computer efficacy skills of physiotherapy students and lecturers to objectively ascertain the factors influencing learners' satisfaction.

This study had some limitations. First, the sample size was relatively small and limited to a university, which may affect the generalizability of the findings to other institutions. Additionally, the study relied on self-reported data, which could introduce bias owing to participants' subjective perceptions. The cross-sectional design of the study also limits the ability to establish causality between the BL approach and students' perceptions and satisfaction. Furthermore, the study did not account for other potential confounding variables, such as prior experience with online learning or access to reliable technology, which could have influenced the outcomes.

CONCLUSION

This study explored the perceptions and satisfaction of clinical physiotherapy students with BL compared with traditional face-to-face teaching. The findings indicated that while students generally had a positive perception of BL, their overall satisfaction was moderate, with specific concerns related to technological support, course management, and instructor characteristics. The study suggests that while BL offers flexibility and convenience, it also presents challenges that need to be addressed to enhance student satisfaction and learning outcomes. To improve student satisfaction, institutions should focus on enhancing technological infrastructure, providing adequate support for students and instructors, and refining course management strategies. Additionally, the findings underscore the importance of continuous evaluation and adaptation of BL approaches to better meet the needs of students. Future research should explore larger and more diverse populations, including longitudinal studies to better understand the long-term impact of BL on student learning and professional development.

Ethics approval

Ethical approval was obtained from the Ethical Review Committee of Nnamdi Azikwe University, Nnewi Campus.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

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