



PERCEPTION OF BLENDED LEARNING METHODS IN FACILITATING CONTINUOUS EDUCATION AMONG HEALTH CARE PROFESSIONALS: A CROSS-SECTIONAL STUDY

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Article DOI: <https://doi.org/10.36713/epra28831>

DOI No: 10.36713/epra28831

ABSTRACT

Blended learning has emerged as an innovative pedagogical approach that effectively bridges the gap between traditional classroom-based instruction and technology-mediated education. By combining the structure of face-to-face learning with the flexibility of online platforms, it offers a versatile and contextually responsive model of education. This approach is particularly relevant for healthcare professionals, who must balance demanding clinical responsibilities with continuous education requirements. The present cross-sectional study aimed to evaluate the effectiveness of blended learning in facilitating continuous education among healthcare professionals. Data was collected from a total of hundred participants using a semi-structured questionnaire that assessed perceptions, advantages, and challenges related to blended learning. The results revealed highly positive perceptions among participants, emphasizing the approach's flexibility, accessibility, and cost-effectiveness. It was strongly statistically significant that participants' motivations for opting for blended learning had a strong positive influence on their perceived learning benefits. Respondents noted that blended learning enhanced their ability to manage time, access learning materials asynchronously, and integrate theory with practice through periodic in-person sessions. However, challenges such as limited interpersonal interaction, concerns about academic integrity, shifting hours of duties and disparities in technological access persisted. The findings align with existing global evidence suggesting that blended learning promotes lifelong learning and professional development when supported by adequate institutional infrastructure and faculty readiness. Overall, the study concludes that blended learning represents a sustainable and learner-centered educational model capable of advancing healthcare education in the digital era.

KEYWORDS: Blended learning, e-learning, healthcare education, continuous professional development, hybrid learning.

INTRODUCTION

Blended learning can be defined as the purposeful integration of online and offline instructional components to create a cohesive and interactive learning experience¹. Prior to the COVID-19 pandemic it was not viewed as a frequently opted method over conventional mode of learning, but the pandemic showcased blended learning to be the most accessible and convenient form of learning for the healthcare workers struggling to balance both their full-time employment and further education. The pandemic further underscored the importance of blended learning, as institutions worldwide were compelled to shift toward digital modalities of instruction³. Studies have shown that, though blended mode initially seemed abrupt, it catalyzed pedagogical innovations that have persisted beyond the pandemic⁴. In healthcare education, where professional competence and continuous learning are vital, the need for flexible yet effective educational strategies has never been greater. Traditional classroom-based learning, while effective for experiential engagement, often poses challenges for healthcare professionals who struggle to balance their demanding clinical duties with academic advancement. According to Hrastinski², blended learning enhances accessibility and flexibility, providing learners with the ability to study at their own pace while still engaging with

instructors and peers. This approach is particularly suitable for healthcare professionals who require continuing education but face logistical and temporal constraints. The COVID-19 pandemic further underscored the importance of blended learning, as institutions worldwide were compelled to shift toward digital modalities of instruction³. Studies have shown that this transition, though initially abrupt, catalyzed pedagogical innovations that have persisted beyond the pandemic⁴⁻⁶. (Rapanta et al.³) emphasized the centrality of teacher presence and pedagogical design in ensuring meaningful engagement in online environments, while Dziuban et al.⁵ opined blended learning to be the "new normal" in higher education.

For healthcare professionals, blended learning offers additional benefits by enabling access to digital resources complementing synchronized, skill-based contact hour learning sessions which ensure preservation of clinical and laboratory competencies essential to professional practice. However, successful implementation depends on factors as digital literacy, infrastructure availability, and institutional support^{7, 8}. This study was undertaken to explore –

1. To assess the knowledge and perceptions of healthcare professionals regarding the effectiveness of blended learning methods.



2. To identify the advantages of blended learning methods from healthcare professionals' perspective.

To explore the challenges associated with the blended learning methods, from healthcare professionals' perspective.

MATERIALS & METHODS

This study employed a descriptive cross-sectional approach to understand the perception associated with blended mode of learning among healthcare professionals. This research was carried out among healthcare professionals who are acquainted with the interface of blended learning methods. Convenient method of sampling was utilized to select participants through professional and institutional networks for this study. Participants included doctors, nurses, pharmacists, public health officers, and allied health practitioners who were simultaneously engaged in full-time employment. Data was collected using a semi-structured questionnaire developed after literature search, to assess healthcare professionals' perceptions regarding blended learning in facilitating continuous education. It comprised five sections: (i) socio-demographic characteristics, (ii) previous exposure to online and blended learning, (iii) perceived benefits and preferences related to blended learning, and (iv) challenges encountered while participating in blended learning pedagogy and (v) willingness to undertake blended mode of learning in future. Data was visualized with the use of Microsoft excel and SPSS (V26) was used to analyze the data using descriptive and inferential statistics. Linear regression was performed to assess the statistical association between variables. Ethical considerations were strictly observed such as, participation was voluntary, informed consent was obtained before collection of data, and anonymity was maintained. No personally identifiable data was collected.

RESULT

A total of 100 healthcare professionals participated in this cross-sectional study assessing perceptions and acceptance of blended learning pedagogies in continuous education programs for healthcare workers. The participants represented a diverse professional background, including doctors, nurses, pharmacists, public health officers, and allied health practitioners actively engaged in full-time employment while pursuing further education.

Out of 100 respondents 59% were female and 41% were male, indicating a predominance of female participants in this study. Most participants belonged to the 25-40-year age group (n=54; 54%), representing mid-career professionals who are in persuasion of higher education. The remaining n=46 participants (46%) belonged to the early-career or fresher in field category (aged below 25 years) or experienced professional category (who were aged above 40 years), this

distribution of participants reflects a diverse professional continuum across experience levels.

All participants (n=100) reported prior experience attending online classes, demonstrating universal exposure and widespread nature of digital teaching-learning pedagogy among healthcare professionals. About the types of online learning methods, they had engaged themselves in, 53 % indicated that they have undertaken college-based diploma or degree courses, while 47% reported participation in webinars, online certificate courses, or e-conferences/workshops. This distribution suggests that professionals frequently combine formal education with informal digital learning to enhance their knowledge base and technical competence. A large majority of participants, (65%) could correctly identify blended learning as the integration of online teaching with in-person contact hour classes. Only 35% viewed it as an entirely online learning process. When exploring the reasons for opting for blended learning, 52% participants recorded that they opted blended method to be able to maintain work-life balance, 21% participants mentioned to enhance their professional skills, and 15% participants attributed their choice to the necessity created by the COVID-19 pandemic. The remaining 12% selected flexibility and convenience as their primary motivation for opting blended learning pedagogies. These findings indicate that time management and accessibility were key motivators in adopting blended learning among working healthcare professionals.

Overall experiences of healthcare professionals with blended learning were noted to be positive. A majority, 51 participants, stated that the blended mode enabled them to manage professional responsibilities alongside academic learning. Another 42 participants reported that online components expanded their access to global knowledge and interdisciplinary learning, while 7 participants found the model convenient and engaging.

Although participants did highlight several challenges associated with blended learning pedagogies, the most occurring issue was poor internet connectivity (52%), followed by reduced face-to-face interaction and limited collaboration among peer groups (13%). Other challenges included shifting professional responsibilities affecting timely participation (13%) and concerns regarding academic integrity in online assessments were also raised (22%). When comparing learning preferences, 60% of participants favored blended learning over traditional classroom-based instruction, in contrast, 40 participants preferred conventional teaching methods for their greater impact of interpersonal engagement.

95% of the respondents reported a willingness to participate in future blended learning initiatives, moreover, 5% of participants indicated that they would recommend blended learning programs to others.



Table 1. Participant characteristics, perceptions, and experiences regarding blended learning

Variable	Category	Frequency (n=100)	Percentage (%)
Gender	Female	59	59.0
	Male	41	41.0
Age Group (years)	<25	31	31.0
	25–40	54	54.0
	>40	15	15.0
Prior Online Class Experience	Yes	100	100.0
	No	0	0.0
Type of Online Learning Attended	College-based degree/diploma	53	53.0
	Webinars/e-conferences	23	23.0
	Online certificate courses	24	24.0
Understanding of Blended Learning	Combination of online and face-to-face learning	65	65.0
	Entirely online learning	35	35.0
Reason for Choosing Blended Learning	Work–life balance	52	52.0
	Skill enhancement	21	21.0
	COVID-19 necessity	15	15.0
	Flexibility/convenience	12	12.0
Perceived Benefits	Managed academic–professional balance	51	51.0
	Expanded access to global learning resources	42	42.0
	Convenient and engaging format	7	7.0
Challenges Experienced	Poor internet connectivity	52	52.0
	Limited peer interaction	13	13.0
	Academic integrity concerns	22	22.0
	Shifting professional responsibilities affecting timely participation	13	13.0
Learning Preference	Prefer blended learning	60	60.0
	Prefer traditional methods	40	40.0
Future Intentions	Willing to continue blended learning	95	95.0
	Would recommend to peers	89	89.0

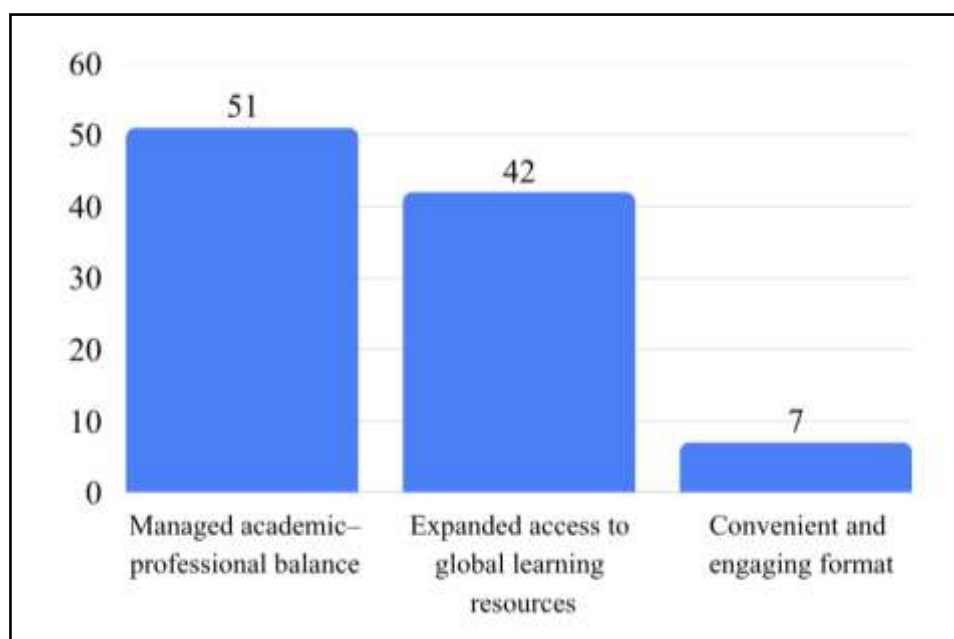


Figure 1 – Perceived Benefits of Blended learning Pedagogies as reported by the participants

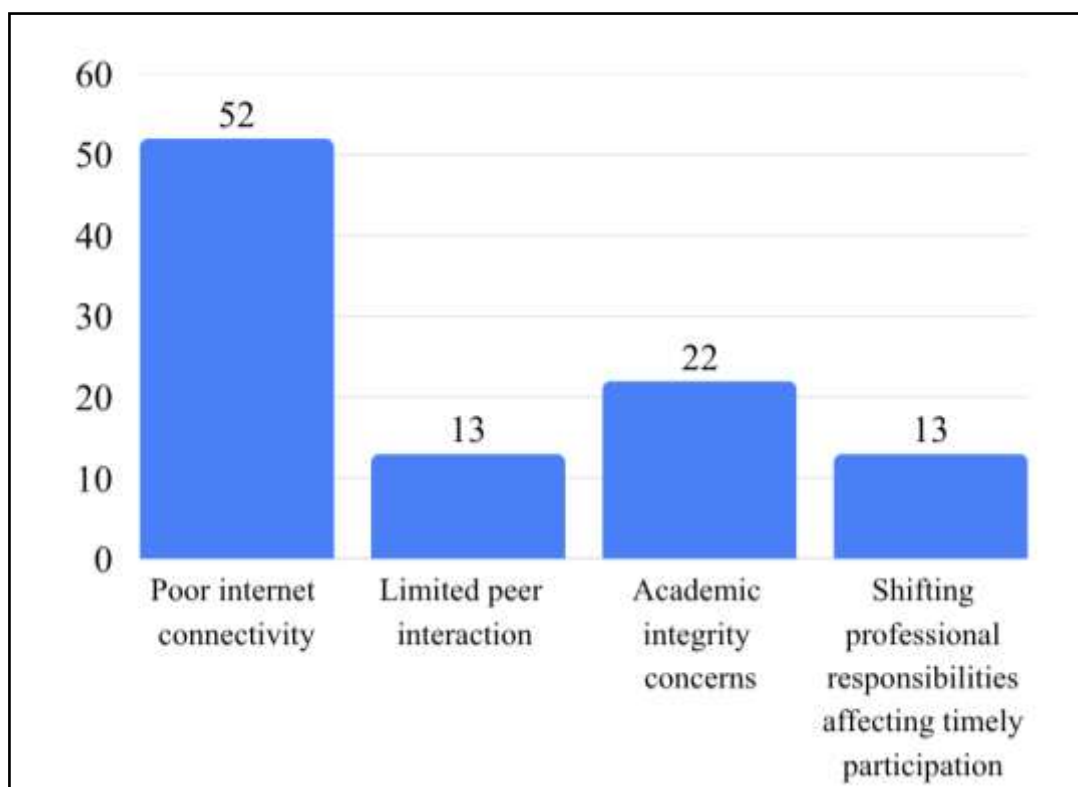


Figure 2. – Challenges faced by the learners during opting for blended mode of learning

Pearson Chi Square test was applied to find the Association of Participant Characteristics with Perceived Benefits of Blended Learning and Challenges Experienced During Blended Learning.

Participant Characteristics like Reason for Choosing Blended Learning ($p < 0.001$), Preference for Blended Learning ($p = 0.011$) and Recommend Blended Learning to

Others ($p = 0.045$) are found to be associated with Perceived Benefits of Blended Learning. Participant Characteristics like Reason for Choosing Blended Learning ($p < 0.026$), Preference for Blended Learning ($p = 0.012$) and Preference for Future Blended Learning ($p = 0.015$) are found to be associated with Challenges Experienced During Blended Learning.

Table 2. Association Between Perceived Benefits of Blended Learning and Participant Characteristics (n = 100)

Variables	Managed academic–professional balance n (%) (n=51)	Expanded access to global learning resources n (%) (n=42)	Convenient and engaging format n (%) (n=7)	χ^2	df	p-value
Gender				0.015	2	0.992
Female	30 (58.8)	25 (59.5)	4 (57.1)			
Male	21 (41.2)	17 (40.5)	3 (42.9)			
Age Group				2.964	4	0.564
<25 years	14 (27.5)	13 (31.0)	4 (57.1)			
25–40 years	30 (58.8)	22 (52.4)	2 (28.6)			
>40 years	7 (13.7)	7 (16.7)	1 (14.3)			
Type of Online Learning Attended				5.131	4	0.274
College-based degree/diploma	26 (51.0)	21 (50.0)	6 (85.7)			
Online certificate courses	14 (27.5)	8 (19.0)	1 (14.3)			
Webinars/e-conferences	11 (21.5)	13 (31.0)	0 (0.0)			
Reason for Choosing Blended Learning				54.895	6	<0.001
Work–life balance	42 (82.4)	9 (21.4)	1 (14.3)			
Skill enhancement	7 (13.7)	14 (33.3)	0 (0.0)			
COVID-19 necessity	0 (0.0)	10 (23.8)	5 (71.4)			



Flexibility/convenience	2 (3.9)	9 (21.4)	1 (14.3)			
Preference for Blended Learning				8.958	2	0.011
Yes	36 (70.6)	23 (54.8)	1 (14.3)			
No	15 (29.4)	19 (45.2)	6 (85.7)			
Preference for Future Blended Learning				2.668	2	0.263
Yes	50 (98.0)	39 (92.9)	6 (85.7)			
No	1 (2.0)	3 (7.1)	1 (14.3)			
Recommend Blended Learning to Others				6.195	2	0.045
Yes	49 (96.1)	35 (83.3)	5 (71.4)			
No	2 (3.9)	7 (16.7)	2 (28.6)			

Table 3. Association Between Challenges Experienced During Blended Learning and Participant Characteristics (n = 100)

Variables	Poor internet connectivity n (%) (n=52)	Limited peer interaction n (%) (n=13)	Academic integrity concerns n (%) (n=22)	Shifting professional responsibilities affecting timely participation n (%) (n=13)	χ^2	df	p-value
Gender					0.894	3	0.827
Female	31 (59.6)	7 (53.8)	12 (54.5)	9 (69.2)			
Male	21 (40.4)	6 (46.2)	10 (45.5)	4 (30.8)			
Age Group					5.104	6	0.531
<25 years	15 (28.8)	2 (15.4)	7 (31.8)	7 (53.8)			
25–40 years	29 (55.8)	8 (61.5)	12 (54.5)	5 (38.5)			
>40 years	8 (15.4)	3 (23.1)	3 (13.6)	1 (7.7)			
Type of Online Learning Attended					3.254	6	0.776
College-based degree/diploma	29 (55.8)	8 (61.5)	10 (45.5)	6 (46.2)			
Online certificate courses	13 (25.0)	2 (15.4)	6 (27.3)	2 (15.4)			
Webinars/e-conferences	10 (19.2)	3 (23.1)	6 (27.3)	5 (38.5)			
Reason for Choosing Blended Learning					18.880	9	0.026
Work–life balance	30 (57.7)	5 (38.5)	13 (59.1)	4 (30.8)			
Skill enhancement	7 (13.5)	5 (38.5)	3 (13.6)	6 (46.2)			
COVID-19 necessity	11 (21.2)	0 (0.0)	4 (18.2)	0 (0.0)			
Flexibility/convenience	4 (7.7)	3 (23.1)	2 (9.1)	3 (23.1)			
Preference for Blended Learning					10.883	3	0.012
Yes	36 (69.2)	6 (46.2)	15 (68.2)	3 (23.1)			
No	16 (30.8)	7 (53.8)	7 (31.8)	10 (76.9)			
Preference for Future Blended Learning					10.453	3	0.015
Yes	51 (98.1)	13 (100.0)	18 (81.8)	13 (100.0)			
No	1 (1.9)	0 (0.0)	4 (18.2)	0 (0.0)			
Recommend Blended Learning to Others					6.759	3	0.080
Yes	49 (94.2)	10 (76.9)	17 (77.3)	13 (100.0)			
No	3 (5.8)	3 (23.1)	5 (22.7)	0 (0.0)			



Table 4. Multiple Linear Regression Analysis Predicting Blended Learning Benefits (n = 100)

Predictor Variables	B	SE	β	p-value
Constant	0.486	0.265	—	0.070
Reason for choosing blended learning	0.316	0.048	0.541	<0.001
Preference for blended learning over traditional classroom teaching	0.175	0.109	0.138	0.114
Preference for future blended learning sessions	-0.147	0.270	-0.051	0.588
Willingness to recommend blended learning	0.353	0.188	0.178	0.064

Model fit: $R^2 = 0.388$; Adjusted $R^2 = 0.362$; $F(4,95) = 15.055$; $p < 0.001$; Standard Error of Estimate = 0.499.

Multiple linear regression analysis was also performed to identify factors associated with perceived benefits of blended mode of learning. The overall regression model was statistically significant ($F(4,95) = 15.055$, $p < 0.001$), explaining 38.8% of the variance in perceived blended learning benefits ($R^2 = 0.388$; Adjusted $R^2 = 0.362$). Among the variables included in the model, reason behind opting blended mode of learning was the only significant predictor ($B = 0.316$, $\beta = 0.541$, $p < 0.001$), indicating that participants' motivations for opting for blended learning had a strong positive influence on their perceived learning benefits.

DISCUSSION

This study reaffirms that blended learning pedagogy is perceived by healthcare professionals to be more flexible, effective, and sustainable model for continuing education. Majority of the participants' positive perceptions mirror the findings of Garrison and Kanuka¹, who identified blended learning as a transformative approach in the education sector that deepens engagement by integrating reflective and interactive components. Similarly, Hrastinski² emphasized that blended learning enhances accessibility and learner autonomy, qualities that were majorly acknowledged by participants in this study.

The pandemic significantly accelerated the adoption of technology-enhanced learning worldwide. Rapanta et al.³ observed in their study that this transition revolutionized instructional delivery, encouraging institutions to innovate beyond conventional pedagogy. The present study supports this observation, as participants gave credit to blended learning for improving their ability to manage professional workloads while pursuing academic advancement simultaneously. These outcomes are consistent with Singh et al.⁴ and Dziuban et al.⁵, who outlined blended learning as the “new normal” in higher education industry.

At the same time, participants acknowledged persistent challenges, particularly poor network access, limited interpersonal contact, and difficulties in joining sessions due to shifting hours of professional responsibilities. These barriers echo those identified by Bower et al.⁹ and Diep et al.¹⁰, who noted that technical support, teacher presence, and course design significantly impact learner satisfaction and engagement in hybrid environments.

Despite these challenges, the strong proclivity toward continued use of blended learning reflects its growing acceptance in healthcare education. Participants highlighted that periodic and scheduled in-person sessions are essential to preserve the experiential learning components such as laboratory practice and clinical skill acquisition, aligning with the recommendations of the study done by O'Connor et al.⁶. The findings also indicate that blended learning can

significantly enhance inclusivity, providing equitable opportunities for professionals in remote or resource-limited areas as supported by Alammery et al.⁷. Overall, this study highlights the importance of institutional readiness, faculty training, and infrastructural investment in sustaining the success of blended learning. As healthcare continues to evolve, blended education serves as a crucial mechanism for lifelong learning and competency-based professional growth.

CONCLUSION

Blended learning methodologies offers a dynamic and learner-centered framework that effectively bridges the gap between traditional and digital pedagogy in healthcare education. The study highlights that healthcare professionals appreciate its flexibility, accessibility, and alignment with the demands of their work schedules. Although technical barriers and time constraints remain, the overall satisfaction and continued interest in blended approaches indicate a significant and prominent shift toward digitally mediated lifelong learning. Institutions should therefore focus on enhancing digital infrastructure, faculty capacity, and learner support to realize the full potential of blended learning in healthcare education.

LIMITATIONS

This study had certain limitations. The sample size was quite a few ($n=100$) and restricted to only group of healthcare professionals, which limits generalizability. Data were based on self-reported perceptions and may be influenced by response bias. Additionally, the study focused on subjective experiences faced by the learners rather than objective performance outcomes, however it will help to develop ideas for future research.

CONFLICT OF INTEREST

There was no conflict of interest.

ETHICAL APPROVAL

Approved

FUNDING

Nil