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# A comparison of physiotherapy students' perception about blended learning with online learning during COVID-19 pandemic: A mixed method of study

Narasimman Swaminathan<sup>1</sup>, Latha Ravichandran<sup>2</sup>, Sivakumar Ramachandran<sup>3</sup>, Steve Milanese<sup>4</sup>

<sup>1</sup>Faculty of Allied Health Sciences and Faculty of Physiotherapy, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India, <sup>2</sup>Centre for Health Professionals Education, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India, <sup>3</sup>Faculty of Physiotherapy, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India, <sup>4</sup>School of Health Sciences, University of South Australia, Adelaide, Australia

## Address for correspondence:

Narasimman Swaminathan, Professor of Physiotherapy, Vice Principal, Faculty of Allied Health Sciences, Sri Ramachandra Institute of Higher Education and Research, Sri Ramachandra Nagar, Porur, Chennai – 600 116, Tamil Nadu, India. E-mail: [narasimmanathan@sriaramachandra.edu.in](mailto:narasimmanathan@sriaramachandra.edu.in)

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## Abstract

**BACKGROUND:** The COVID-19 pandemic has affected face-to-face teaching across the globe. The sudden shift in learning methods has impacted learning experiences significantly. Students' perception about online compared to blended learning might affect learning. The objective of this study was to evaluate physiotherapy students' perception of blended compared to online learning.

**MATERIALS AND METHODS:** This mixed-method study documents physiotherapy students' perception about the courses delivered through blended learning (BL) mode during the COVID-19 pandemic. Physiotherapy graduates and postgraduate students who completed their evidence-based physiotherapy practice courses at Sri Ramachandra Institute of Higher Education and Research, Chennai ( $N = 68$ ) participated in this study. The participants' perceived experience about synchronous online mode and BL during the pandemic was assessed using a questionnaire and focus group discussion.

**RESULTS:** All the participants felt that the course outcomes were met and that they gained knowledge and skills in evidence-based practice. Most of the students (93%) recommended a blended mode of learning compared to online learning alone. Thematic analysis of the focus group discussion (FGD) identified enhanced learning experience, collaborative learning as enablers to BL, and availability of gadgets and quality of online contents as barriers.

**CONCLUSION:** Participants showed par preference for blended learning over online learning as it provided flexibility and facilitated active learning compared to online learning alone.

## Keywords:

Blended learning, health professional education, learning experience, online learning, perception, physiotherapy

## Introduction

Learners in the current generation are comfortable with digital tools for their education. Higher education institutes across the globe have utilized information communication technologies (ICT) to enhance the learning experiences of students.<sup>[1]</sup> ICT caters to the learning needs of students with different learning styles,<sup>[2]</sup>

and provides opportunities for learners to interact with their peers and teachers, both synchronously and asynchronously. Use of ICTs in imparting knowledge and skills in the education of health professionals is being explored with a growing body of evidence.<sup>[3-5]</sup>

At present, health profession education institutes integrate online methods to

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optimize teaching and learning. It is well documented in literature that online mode provides flexibility and opportunities for collaborative learning.<sup>[5,6]</sup> Our earlier study explored students' readiness toward online learning as a component of BL, n identified improved flexibility in accessing learning materials, and peer interactions as advantages.<sup>[7]</sup> Learning through online mode has challenges and difficulties. Access to learning platforms, availability of computers and the internet were some of the challenges for developing countries.<sup>[3,7]</sup> Online learning can be synchronous and asynchronous. In synchronous learning, the teacher and learners interact in "real time" in a virtual environment, whereas in asynchronous learning, the teacher uploads learning materials in a structured platform. Learners can access the contents and complete the activities at their convenience.<sup>[8]</sup>

Studies exploring students' perception about online learning alone compared to face-to-face learning yielded mixed results. Learners' perceived knowledge acquisition through online learning was less compared to face-to-face teaching. Students preferred direct learning as it facilitated self-directed and autonomous learning.<sup>[9]</sup> In contrast, studies reported that students preferred online learning as it provided flexibility in learning and opportunities to interact with their teachers and peers.<sup>[10,11]</sup>

Integrating traditional face-to-face with online learning might provide better learning experience and improved outcomes. Various methods of ICT-enabled teaching have been explored with blended learning (BL) gaining recent attention as it facilitates active learning.<sup>[12]</sup> BL is defined as "the thoughtful integration of classroom face-to-face learning experiences with online learning experiences."<sup>[13]</sup> The integration of online and face-to-face learning in BL provides greater flexibility for learners as it combines both asynchronous and synchronous learning.<sup>[4]</sup> Students can utilize their learning time by actively participating in asynchronous online activities at their own pace. During face-to-face sessions, higher order learning skills are facilitated through structured activities.<sup>[12]</sup> In traditional methods of teaching, learners depend heavily on face-to-face sessions, where teachers deliver contents as per a fixed plan. It becomes the responsibility of the learners to prepare learning material with the help of their teachers.

Physiotherapy graduates acquire knowledge, skills, and attitudes prescribed by the curriculum through structured programs.<sup>[9]</sup> Physiotherapy education in developed countries has adopted digital teaching methods widely.<sup>[4]</sup> Whilst BL has been widely used in higher education, its effectiveness in physiotherapy education requires further exploration.

Studies comparing the effectiveness of online only learning and BL in improving knowledge and skills among health profession education students have reported mixed results. BL seems to be more effective in improving clinical supervision skills in entry level nursing graduates compared to online only learning.<sup>[14]</sup> A systematic review by Rowe *et al.* identified the limited role of BL in improving clinical skills among health professional graduates.<sup>[15]</sup> Another systematic review assessing the effectiveness of BL in health professional education documented that BL seems to be more effective compared to traditional and online only learning. However, this study reported high heterogeneity.<sup>[16]</sup>

The lockdown due to the COVID-19 pandemic has significantly affected face-to-face teaching,<sup>[17]</sup> and it has been a challenge for educators to engage learners online during the pandemic.<sup>[18]</sup> It is important to understand the student's satisfaction about newer methods of learning introduced during the pandemic.<sup>[19]</sup> "Evidence Based Physiotherapy Practice" and "Transferring Research into practice" are the two courses that have been offered in blended mode since 2019. These courses were structured as per the hallmarks of BL.<sup>[20]</sup> Availability of course contents through online, provided flexibility to students in learning. In the online mode, the availability of the facilitator was achieved by providing regular feedback on learning and interaction through chat. The facilitator ensured that there was seamless integration between online activities and synchronous sessions.

Students enrolled in these blended courses had two hours of weekly face-to-face sessions along with asynchronous online learning through learning management system (LMS). The face-to-face sessions were replaced by synchronous (real-time) online sessions during the pandemic. Students simultaneously completed other courses in synchronous mode during the pandemic. This provided an opportunity to understand learners' perspectives regarding BL and online learning (OL).

This study evaluated the physiotherapy students' perception of blended courses in comparison with traditional courses delivered via online learning (OL) during the COVID-19 pandemic.

## Materials and Methods

### Study design

This study used a mixed-method approach to identify physiotherapy students' perception of BL when compared to OL during the COVID-19 pandemic.

### Ethical consideration

This study was approved by the Institutional Ethics Committee (IEC-NI/19/APR/69/37). Participant's

informed consent was obtained prior to the commencement of data collection.

The entry-level graduates completed "Evidence-Based Physiotherapy Practice (EBP)" ( $N = 42$ ), and postgraduate physiotherapy students completed "Transferring Research in to Practice" ( $N = 26$ ) course during the period of December 2019 to May 2020 at Sri Ramachandra Institute of Higher Education and Research, Chennai were included. Both the courses were offered in blended mode. During the lockdown period, face-to-face sessions were replaced by synchronous online sessions. Participants completed other courses simultaneously, which were usually offered in a traditional face-to-face manner but continued as synchronous online mode during the pandemic. Feedback was obtained at the end of the course after declaration of final results.

### Sampling technique

This study used purposive sampling technique, to include potential participants who experienced both blended and synchronous online learning.

### Data collection

Participants' perception about BL in comparison with OL were recorded using a questionnaire specially developed for this study. A focus group discussion was conducted to understand the learner's perception and experience.

### Framework of courses

This study involved students of two different courses offered in blended mode.

- Evidence Based Physiotherapy Practice (EBP): It was a 3-credit course aimed at introducing the concepts of EBP to entry-level physiotherapy graduates.
- Transferring Research into Practice: A 3-credit advanced level course intended to facilitate EBP skills among postgraduate physiotherapy students.
- Course learning outcomes were defined and mapped with Bloom's taxonomy of learning.
- Teaching and assessment methods were mapped according to defined learning outcomes for each session.
- Students were provided access to course contents through the dedicated LMS of the institute.
- Asynchronous online components included video tutorials, external links, reading materials, automated quiz, discussion forums and assignments.
- Face-to-face sessions included small group discussions, tutorials, digital quizzes, interactive lectures, and group presentations.
- Attainment of learning outcomes were assessed using predetermined continuous and summative assessment.
- Learners received individualized feedback through online and face-to-face sessions during the course.

- During the pandemic lockdown period, synchronous sessions were conducted using BigBlueButton, a virtual opensource platform available through the institute's LMS.

### Data collection tool

A structured questionnaire to document students' perception of BL compared with OL was prepared based on the available literature and personal experience. Experts ( $N = 4$ ) trained in educational technology provided feedback on the contents of the questionnaire. The questionnaire was finalized based on the feedback received. The final questionnaire comprised of the following components:

- Feedback on course learning outcomes, teaching learning, and assessment methods
- Participants' perception of BL compared to OL
  - Learning flexibility
  - In-depth learning
  - Learning comfort
  - Feedback received on learning
  - Peer-to-peer interaction
  - Interaction with teacher
  - Challenges faced
  - Learners' recommendation

The questionnaire consisted of three sections: The first section comprised of six Likert scale questions on the student's feedback; the second section asked about the learner's perception about BL compared to OL through a check box grid. The third section obtained open feedback on challenges faced during BL and OL (Annexure 1). Participants completed the questionnaire that were shared through Google Forms.

### Focus group discussion

An open invitation to participate in a focus group discussion (FGD) was sent to all of the students enrolled in the courses. A total number of 10 students voluntarily participated in FGDs, which aimed to understand their perception of BL when compared to online learning alone. The FGD was conducted online and recorded with the consent of the participants. One of the authors (NS) competent in FGD conducted the session. Participants were informed about the aims and objectives of the FGD at the beginning of the session. The FGD lasted for 50 minutes.

### Data analysis

The responses were segregated according to the questionnaire section and entered into a spreadsheet; frequency and percentages were calculated using the analysis function.

### FGD analysis

One of the researchers (NS) and a scribe who was not involved in the study, independently transcribed the

discussion verbatim. Transcribed documents were mapped and scrutinized to finalize the content for thematic analysis. Thematic content analysis was carried out by coding the data by the researcher and an expert not involved in the study, independently using the predetermined criteria. In the first step, words providing similar meaning from the data were grouped as meaning units. In the second step, identified units were condensed as codes, and themes were then identified by grouping the codes.

## Results

All 68 students enrolled in the two courses responded to the survey. Most respondents reported that the course enhanced their knowledge and skills in EBP, and they were satisfied with course contents, delivery, and assessment methods adopted. Table 1 provides the details of students' perception of the courses.

Most participants (93%) recommended BL compared to OL. Participants perceived that BL provided a better opportunity to interact with their peers and faculty members (91%). According to the respondents, more in-depth learning happened in BL (88%) when compared to online learning alone (12%). Figure 1 compares participants' perception of BL and OL method of teaching.

## FGD results

Analysis of the FGD identified three themes from eight categories. Table 2 shows the categories and themes identified.

### I. Learning experience:

#### I.1. Access to learning materials.

Participants in the FGD expressed that BL provided easy access to learning materials. The online availability of resources provided flexibility in learning and allowed learners to prepare for face-to-face sessions in advance.

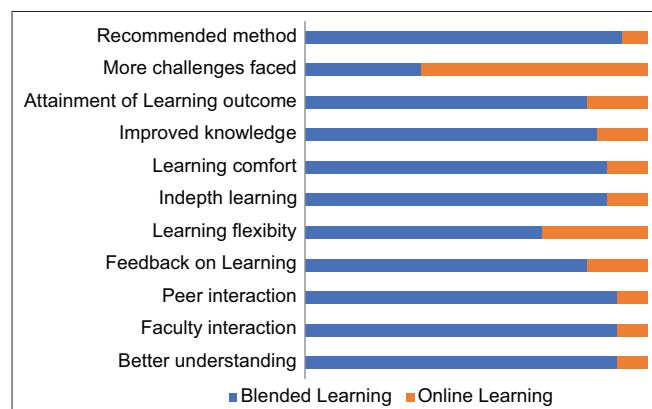


Figure 1: Learner's perception of blended learning compared to online learning

*"I would go through the posted materials come prepared for the class and update it during face-to-face session."*

*"I could access contents from my mobile and could revisit the materials as many times."*

*"It was so flexible for me to watch videos posted in LMS whenever I have time."*

### I.2. Active Learning

Participants felt that the BL approach enhanced active learning since face-to-face sessions facilitated more in-depth discussion while online sessions provided opportunities to refer to more learning resources. Active participation in discussion forums and face-to-face sessions were highlighted by the group.

*"We learn it ourselves and our understanding was more when compared to regular teaching."*

*"I think this type of learning set a base for self-learning and helps learning in a better way."*

*"I think concept of self-learning is better in BL."*

### I.3. Understanding of the Subject

More in-depth learning happened in BL when compared to traditional teaching as the courses provided opportunities for discussions and deliberations.

Table 1: Student feedback on the courses\*

| Student feedback about the courses   | 5  |    | 4  |    | 3 |   |
|--|----|----|----|----|---|---|
|  | n  | %  | n  | %  | n | % |
| The course learning outcomes were well defined                                   | 61 | 90 | 6  | 9  | 1 | 1 |
| The course contents were appropriate to the learning outcomes                    | 56 | 82 | 12 | 18 | 0 | 0 |
| Teaching methods adopted were appropriate  | 57 | 84 | 11 | 16 | 0 | 0 |
| The online contents/materials provided were adequate                             | 45 | 66 | 21 | 31 | 2 | 3 |
| The assessment methods adopted were appropriate                                  | 53 | 78 | 14 | 21 | 1 | 1 |
| Overall, the course enhanced my knowledge and skills in evidence-based practice. | 59 | 88 | 9  | 13 | 0 | 0 |

\*Likert scale had a score range of 5 for strongly agree and 1 for strongly disagree. There were no responses on category 2 and 1.

Table 2: Themes and categories identified through the focus group discussion

| Theme                  | Categories   |
|------------------------|--|
| Learning experience    | Access to learning materials                             |
|                        | Active learning  |
|                        | Understanding of subject                                 |
| Collaborative learning | Peer-to-peer collaboration                               |
|                        | Learner-teacher collaboration                            |
| Perceived barriers     | Quality of content                                       |
|                        | Availability of gadgets for online learning and internet |

*"I feel learning is effective due to more discussion and I am able to remember for a long time in BL."*

*"I think there is more opportunity for reflection and application is better in BL."*

*"We were well prepared for exams compared to traditional methods."*

## II. Collaborative Learning

### II.1. Peer-to-peer collaboration

Members of the FGD felt that they were able to collaborate with their peers compared to traditional teaching. The discussion forums created during both online and face-to-face sessions provided opportunity for collaborative learning.

*"We had an opportunity to blend in groups; during class there was much discussion among our colleagues."*

*"I was more focused and could sense healthy competition among the peers."*

*"Discussions among us were encouraged during class hours and through online, which were fun."*

### II.2. Learner-Teacher collaboration

Participants expressed that they were able to better collaborate with the teacher in the BL model.

*"None of us asked doubts during traditional lecture hours; I felt there was more interaction between the students and teachers during BL compared to online alone."*

*"I felt receiving feedback for assignments was better in BL compared to traditional sessions."*

*"There is less opportunity to ask questions to the faculty members during traditional teaching; we were afraid of asking questions, but in BL the chances to interact with teacher was more."*

## III. Perceived Barriers

### III.1. Quality of Content

Most participants in the FGD expressed that the quality of online content might be a barrier for BL. They also identified that the learners expect shorter duration of video tutorials and more interactive contents.

*"I don't know whether the online contents will be the same as this course; if it is not attractive, I may not learn in depth."*

*"I agree, online contents should be of high quality and interesting; students may not access it if it is confusing."*

*"I felt that the video lectures should be for shorter duration, to understand better."*

### III.2. Availability of gadgets for online learning and internet.

Most members accessed the learning contents through smart phones. Participants reported limited access to computers, laptops, and tabs to participate in online activity, and many reported limited internet access.

*"I don't own a computer and at times it is difficult to submit assignments through the phone."*

*"Sometimes I found it difficult to take up lessons using my phone as the screen is too small; typing was also difficult."*

*"Most of the days internet package was not sufficient for online learning."*

*"The Internet was too slow, and I don't have faster connection when I am at home."*

## Discussion

This study identified that physiotherapy students perceived advantages and challenges of BL compared to OL. Participants had the opportunity to experience both BL and OL due to the COVID-19 pandemic. The perceptions of all 68 participants were recorded quantitatively through the survey. Most survey responses matched with the results of the thematic analysis of the FGD. Generally, all participants felt that BL has more advantages compared to OL. Availability of learning materials through LMS provided flexibility in accessing content. Respondents expressed that they were able to complete learning tasks at their own pace and convenience. These findings are similar to the findings of earlier studies.<sup>[5,6]</sup>

Self-directed and active learning were perceived as another advantage of BL. In BL, students are facilitated to carry out learning tasks in a flexible manner, which encourages them to be active learners.<sup>[6]</sup> It appears that the BL approach improved the self-motivation level of students, facilitating active learning.<sup>[14]</sup> In BL, there were opportunities for learners to discuss with their peers through online discussion forums, providing an opportunity for facilitated in-depth learning. The face-to-face sessions were used to facilitate in-depth understanding.<sup>[12,13]</sup>

Learner engagement with the course materials was higher in BL, as evident from the survey and FGD results. The BL method involves multiple methods of teaching, such as video tutorials, podcasts, reading materials, quiz, discussion forums, assignments and presentations to meet a range of learning styles of the students.<sup>[2,21]</sup>

Participants felt that their understanding of the course material was greater in BL as it provided them with an

opportunity to reflect and participate in discussions. Learners reported being more comfortable with BL when compared to OL, with most of the participants recommending BL in the survey, which was echoed in the FGD as well. Findings of this study are in line with previously published articles exploring the effectiveness of BL.<sup>[5,22,23]</sup>

Collaborative learning was another perceived advantage of BL. Members of the FGD felt that they could collaborate better with their peers and instructors through collaborative activities such as discussion forums which facilitated self-directed learning.<sup>[24]</sup> Participants of this study reported having enough opportunities to collaborate through online as well as face-to-face discussions. Students could appreciate their interactions with the course instructor in BL, since feedback on learning was provided immediately. Most of the online activities received automated feedback and there were scheduled interactions with enrolled students. Appropriate feedback enables better learning when compared to delay or no feedback.<sup>[6]</sup>

Participants of the FGD observed that poorly created online contents might affect the learning process. Interactive and high quality content is an essential component of BL.<sup>[25]</sup> The duration of the video tutorials should be short and aligned with the learning outcomes. Unavailability of gadgets and poor internet connection were perceived as barriers to BL, with most of the participants accessing online content through their smartphones. It is important for the educators and higher education institute administrators to consider this factor while introducing online learning components.<sup>[26]</sup>

Accessibility to learning materials, flexibility in learning, peer interaction and facilitator's feedback provided an enhanced learning experience. In-depth learning was achieved in both the courses as per the learner's perception. Students recognized that the course structure was appropriate and aligned with defined learning outcomes. Online content and face-to-face discussions were appropriate for the learning outcomes defined as perceived by the participants. To our knowledge, this is a first-of-its-kind study that analyzed the learners' perception of blended learning in comparison to online learning during the pandemic. Since the participants of this study experienced both blended and online learning, in the same time documenting the learner's perception provides newer insight towards adopting appropriate teaching and learning methods.

### Limitation and Recommendation

This study did not compare the learner's outcome attainment between BL and traditional methods of

teaching. Other studies observed mixed results in the achievement of learning outcomes by BL compared to other methods.<sup>[14,27,28]</sup> The prepared questionnaire was only content validated by four experts. Further studies to identify the effect of BL on achieving learning outcomes are warranted.

### Conclusion

Physiotherapy students who participated in this study preferred blended learning as it provided more flexibility in learning and facilitated collaboration among peers. Learners perceived BL enhanced active learning and understanding of subject matter compared to online learning. Further studies with larger samples to assess the effectiveness of BL compared to online learning in physiotherapy education is warranted.

### Declaration of patient consent

The authors certify that they have obtained all appropriate participants consent forms. In the form the participants) has/have given his/her/their consent for his/her/their images and other information to be reported in the journal. The participants understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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### Conflicts of interest

There are no conflicts of interest.

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