

A Systematic Review on Blended Learning Approach for Student-Teachers Learning From 2019 To 2023

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ABSTRACT In this 21st century using the Blended Learning Approach as one of the innovative techniques in education is seen as a crucial approach and it provides learners a dynamic environment for learning. The present study examined the research related to the Blended Learning Approach concerning student-teachers from 2019 to 2023 by using the Systematic Reviews and Meta-Analysis criteria (PRISMA). Online databases ERIC, Elsevier, Emerald, JSTOR, Nature, Sage, Springer Link and Taylor and Francis were used to search relevant articles. A total of 285 articles were identified through database searching out of which only 11 articles have met the inclusion criteria. From the analysis it was found that the a majority of the researchers used methods of experimental design and a questionnaire as a data gathering instrument.

INTRODUCTION

For a teacher, the activity of teaching is the most important. The two most popular types of teaching are traditional teaching, and the other is online or e-learning. The former is a teacher-oriented method where teachers and students are present physically in a classroom. In contrast, the latter is a student-centric method in which students learn through online mode using electronic devices at their own pace. However, in both, conventional teaching methods and online learning, there are some drawbacks, such as a lack of active engagement of students, lack of interaction, lack of presence of teachers, etc. (Josephine 2016). Therefore, Blended Learning (BL) emerged as one of the innovative solutions to the modern classroom. Blended Learning combines face-to-face instruction and self-paced online learning with mixed media. Carman proposed five components of Blended Learning in 2005. These are live events, self-paced learning, collaboration, assessment, and performance support. The models of Blended

Learning are Rotation Model, Flex Model, Self-blend Model, and Enriched Virtual Model (Deviam, M and Devaki, N 2018). A few of the benefits of Blended Learning in the classroom are flexibility, effectiveness, teacher empowerment, engagement, and differentiation (Vanitha ST and Ramakrishnan, KS 2021). Some challenges of Blended Learning are students' inability to grasp the technicalities of LMS software, technical issues, lack of planning of BL activities due to high workload, requirement of high commitment from students, and insufficient interaction occurred between lecturers and students due to fewer face-to-face sessions (Jumani et al. 2018; Saber et al. 2022). Over the last few decades, many researchers have reviewed articles to investigate effectiveness of Blended Learning in higher education, teacher education programmes, schools, students with special needs and adults in work-place settings. They also answer the pedagogical frameworks and technical methods, advantages and prospects, challenges and difficulties in Blended Learning. Researchers also discovered the usefulness of various forms of technology for vocabulary performance as well as metacognitive techniques and multimodal tools in blended learning English language courses.

Monika, M and Anitha Devi, V (2022) reviewed the Effectiveness of Metacognitive Strategies and

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Multimodal Tools in Blended Learning English Language Classroom from the year 2010 to 2021. The methodology, strategy, and tactics employed in blended learning classrooms are reviewed in this paper. The utilization of multimodal tools and integrated learning accounts for more than 60% of the article. University students are used as study samples in the majority of articles. Prezi is a tool for teaching languages.

Thus, various researchers have reviewed blended learning, however limited studies investigated student-teachers' learning through a blended learning approach. Hence, this systematic review is undertaken to identify the studies that investigate the trends of Blended Learning Approach in teacher education programmes for student-teachers.

Objectives of the Study

The objective of this study was to examine the research related to Blended Learning Approach concerning student-teachers from 2019 to 2023 by using the Systematic Reviews and Meta-Analysis criteria (PRISMA).

Research Questions

The research questions this study aimed to answer are:

1. What are the publication years of selected Blended Learning Approach studies for student-teachers?
2. Which are the countries that have implemented a Blended Learning Approach for student-teachers' learning?
3. What are the research methods used in selected Blended Learning studies?
4. What research tools have been used to assess the effectiveness of blended learning approaches on student-teachers?
5. What are the constructs of the identified studies to explore Blended Learning for student-teachers?

METHODOLOGY

The present study uses a systematic literature review method to analyse studies conducted on Blended Learning Approach for student-teachers. This systematic review was based on Preferred

Reporting Items for Systematic Review and Meta-Analyses (PRISMA) guidelines (Chuane et al. 2022). The study comprehensively reviews existing literature on the Blended Learning Approach conducted from 2019 to 2023. The research design for this study comprises four phases which include the following.

Data Sources and Search Strategy

The articles included in this study were generated through a systematic search in online databases like ERIC, Elsevier, Emerald, JSTOR, Nature, Sage, Springer Link, and Taylor and Francis. Keywords used to search relevant research articles in the databases included "Blended Learning" or "Blended Learning Approach", and "Student-Teachers" or "Pre-Service Teachers". The time range chosen for the literature was from January 2019 to February 2023. The total number of records identified through database searching is 285. The PRISMA flow diagram used to search and refine articles is shown in Figure 1.

Inclusion and Exclusion Criteria

In order to determine which studies need to be included in the review, criteria of inclusion and exclusion were formulated. The criteria are based on teaching method, study context, publication language, publication type, and publication year as shown in Table 1. One research article was established as a duplicate and therefore removed, which resulted in 284 articles. The authors then screened the titles and abstracts to check the articles against inclusion and exclusion criteria. Accordingly, 11 research articles met the inclusion criteria and 273 articles were screened out.

Quality Assessment Criteria

To evaluate the quality of 11 research articles, the authors adopted 6 items from the Quality Assessment Criteria checklist comprising 10 items and revised them as necessary for the current study, as shown in Table 2. The items were measured on a 2-point Likert scale, with 1 point assigned for "Yes" and 0 point for "No". Accordingly, each article receives a score between 0 and 6, and Table 3 displays the results for all 11 studies. It is clear from the results that the chosen

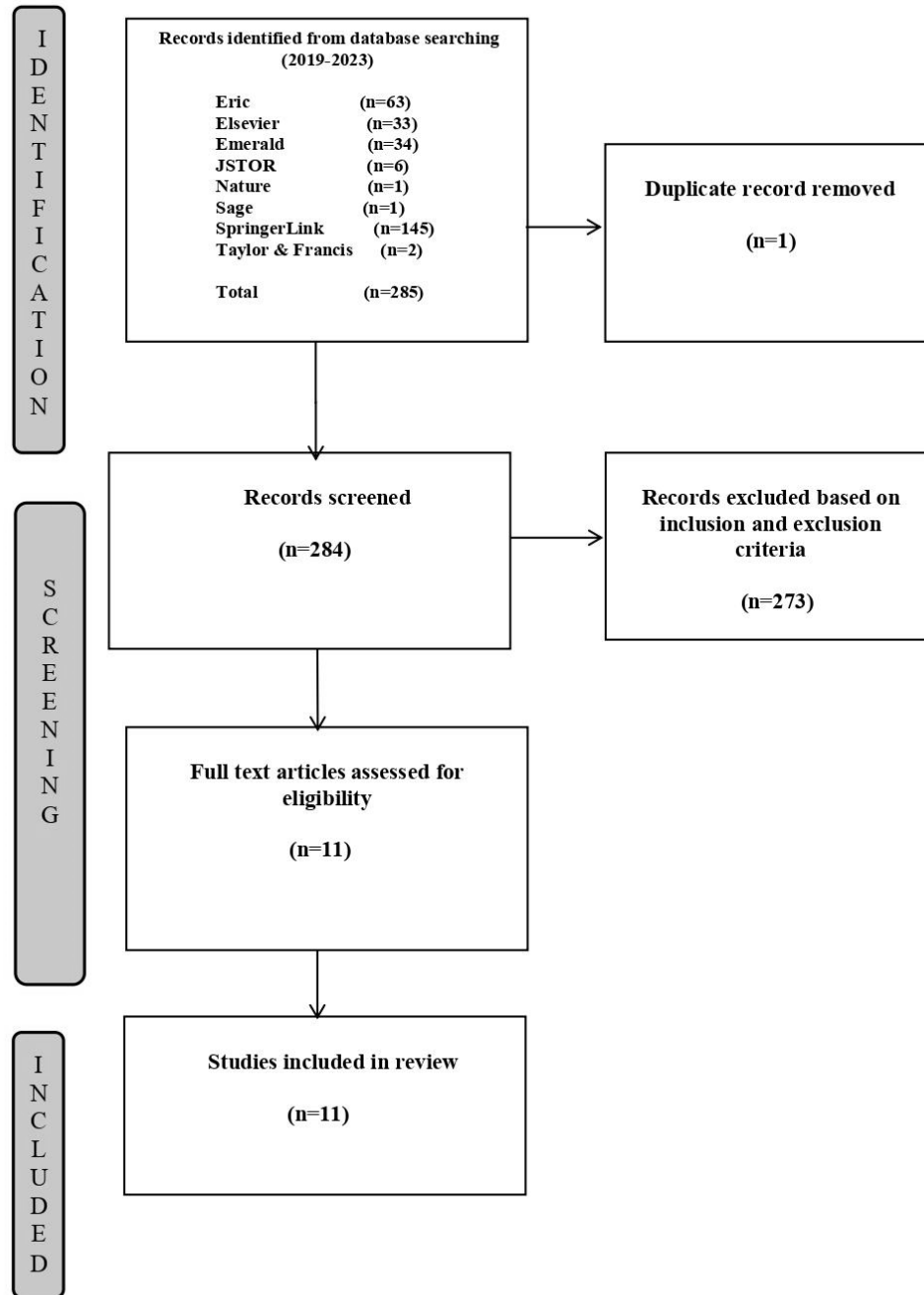


Fig. 1: PRISMA Flow chart diagram of the search and selection of articles
 Source: Compiled by authors

Table 1: Inclusion and exclusion criteria

S. No.	Criteria	Inclusion	Exclusion
1.	Teaching Method	The study should focus on the Blended Learning Approach.	The study focuses on teaching methods other than the Blended Learning Approach.
2.	Study Context	The study should be concerned with student-teachers.	The study was concerned with non-student-teachers.
3.	Publication Language	The study should be published in English.	The study was published in languages other than English.
4.	Publication Type	The study should be empirical research.	The study other than empirical research.
5.	Publication Year	The articles should be published between 2019-2023.	The articles were published before 2018.

Source: Compiled by authors

studies can be considered for review, meaning that all of the articles are acceptable for use.

Table 2: Quality assessment criteria

S. No.	Question
1	Is the research objectives clearly stated?
2	Are any Blended Learning components present in the research study?
3	Is the research method mentioned clearly?
4	Are the tools or instruments used in the study standardised?
5	Are any statistical approaches used in the study to analyse data?
6	Are the results clearly explained?

Source: Compiled by authors

Selection of Article and Data Extraction

After the full-text articles were assessed using quality assessment criteria, all 11 articles were included in the review. The data from the

publications considered in the systematic review are then entered in a Microsoft Excel sheet. This method assisted in coding the essential details from pertinent publications. Generally speaking, the articles were coded according to the author's name, title, year, nations, methodologies, tools, and constructs. The conclusions of all the articles that were chosen were then compiled.

RESULTS

RQ1: What are the publication years of selected Blended Learning Approach studies for student-teachers?

Based on the Inclusion and Exclusion Criteria (Tables 1, 2 and 3), there was appearing to be an increase in Blended Learning studies in the years 2020 to 2021, with publications on the Blended Learning method for student-teachers having the greater number of scholarly publications with five

Table 3: Results of quality assessment

Study	#1	#2	#3	#4	#5	#6	Percentage
Atthachakara (2021)	1	1	0	1	1	1	83
Cacciamani et al. (2021)	1	1	1	0	1	1	83
Chan (2019)	1	1	0	1	1	1	83
Dios and Charlo (2021)	1	1	1	0	0	1	67
Prince et al. (2020)	1	1	1	0	1	1	83
Eren and Dökme (2022)	1	1	1	1	1	1	100
Martínez et al. (2020)	1	1	0	0	1	1	67
Ranjan (2020)	1	1	1	1	1	1	100
*entürk (2021)	1	1	1	1	1	1	100
Shin (2021)	1	1	1	1	1	1	100
Zhu et al. (2020)	1	1	1	1	1	1	100

Source: Compiled by authors

studies in the year 2021. A total of 4 articles were published in 2020, and 1 publication was made in 2019 and 2022. There has not yet been a publication on Blended Learning for student-teachers in 2023.

RQ2: Which are the countries that have implemented a Blended Learning Approach for student-teachers' learning?

In teacher education, blended learning has gained popularity as a teaching strategy. Based on the Inclusion and Exclusion Criteria (Tables 1, 2 and 3), it was found that the articles on the Blended Learning Approach for student-teachers' learning was published in 9 countries from 2019 to 2023. Spain (2), Turkey (2), Thailand (1), Italy (1), China (1), Ghana (1), India (1), USA (1), and Australia (1) were among the countries where the studies were carried out.

RQ3: Which research methods are used for the study?

In the research process, research methods are crucial. They outline the various steps to be used in resolving a research problem. Different research designs have been used to evaluate the effectiveness of the blended learning strategy in teacher education. Based on the Inclusion and Exclusion Criteria (Tables 1, 2 and 3), it was found that the experimental design (4) is used most frequently as a method among all the 11 papers on blended learning, followed by studies with survey method (3), design-based research (2), descriptive

qualitative method (1) and ex post facto and quantitative method (1).

RQ4: What research tools have been used to assess the effectiveness of blended learning approaches for student-teachers?

The questionnaire was found to be the most frequently used research study instrument in the studies that were considered the blended learning approach with regard to student-teachers. In ten research studies a questionnaire was used to evaluate the effectiveness of the blended learning approach. Another crucial measurement tool, which is the achievement test, was used in three studies. Some research studies also used the Analytic Toolkit, the Creative Thinking Test, and the Intelligence Test.

RQ5: What are the constructs of the studies adopted to explore the Blended Learning Approach related to student-teachers' learning?

The constructs associated with blended learning for student-teachers' learning are shown in Table 4. It is indeed difficult to implement a blended learning strategy in a classroom because it is made up of numerous components, or structures, which are crucial for a successful blended learning approach.

DISCUSSION

The Blended Learning Approach (BLA) has emerged as an innovative teaching method that

Table 4: Constructs to explore Blended Learning Approach

<i>Author</i>	<i>Constructs</i>
Atthachakara	Activities, online teaching material, blended learning management, creativity-based learning
Cacciamani et al.	Metacognitive reflection
Chan	Learning materials/websites, online tasks, e-learning, online discussions, independent learning, critical thinking, lecture
Dios and Charlo	Face-to-face learning, electronic learning, subjectivity, resources
Edem et al.	Access to computers, internet connection, ICT skills
Eren and Dökme	Cognitive development, spiritual development
Martínez et al.	Usefulness, closeness, communication, applicability, motivation
Ranjan	Affective attitude, cognitive attitude and behavioural attitude
*entürk	Information and technology literacy skills, critical thinking and problem-solving skills, entrepreneurship and innovation skills, social responsibility and leadership skills, career awareness
Shin	Self-efficacy
Zhu et al.	Intrinsic orientation, performance orientation, metacognitive awareness, self-management

Source: Compiled by authors

combines face-to-face teaching with self-paced online learning using mixed media. The study focuses on a systematic review of studies conducted on BLA to enhance student-teachers' learning. The duration chosen for literature was from January 2019 to February 2023. 11 articles have been chosen for systematic review. The articles were scrutinised to determine the years, countries, methods, tools and constructs used in blended learning studies to shed light on the trends in relation to student-teacher. There is an increase in studies on Blended Learning in the years 2020 to 2021, with the largest number of scholarly publications, that is five studies, in the year 2021 and four articles in 2020 and one publication was made in 2019 and 2022. Similarly, a total of 18 publications concerning this topic were found in 2021, which is the highest number (Zhou and Zhang 2022). Whereas, in the year 2020 the highest publication is made on this topic (Chuane et al. 2022). During the year 2020-2021, during the COVID-19 pandemic, there seem to be many articles about blended learning and online learning because it is the only method that all educational institutions and universities are using (Mistry and Kumar 2022). Results also show that studies have been conducted in different parts of the world, including Spain (2), Turkey (2), Thailand (1), Italy (1), China (1), Ghana (1), India (1), USA (1) and Australia (1). A previous study by Chuane et al. (2022) also mentions Turkey, Thailand and Spain countries, which conducted studies on blended learning. A review study done by Anthony et al. (2022) mentions nations similar to this study such as Ghana, China, Thailand, India, Spain, Turkey and Australia. Similarly, Thailand, Spain and Ghana were mentioned in a study in 2019 by Zavaraki and Schneider. Mubayrik (2018) also emphasised on China, USA and Australia where studies on blended learning were done. In contrast to the present study, Zhou and Zhang (2022) showed in their study that China is one of the most contributing countries in this field.

The study indicated that the most frequently used research method is experimental design (4) followed by studies with survey method (3), design-based research (2), descriptive qualitative method (1), and ex post facto and quantitative method (1). Chuane et al. (2022) points out that quasi-experimental study designs are the most commonly used research method. This study is also consistent

with Atmacasoy and Aksu (2018) who noted that the reviewed studies were primarily conducted in an experimental study design.

The findings also indicate that questionnaires are the most commonly used survey instrument. Ten studies used questionnaires to assess the effectiveness of the Blended Learning Approach. Similarly, Anthony et al.'s (2022) studies also confirm that questionnaire surveys are the most commonly used data collection tool, followed by achievement test. This systematic review explores the constructs used to examine the blended learning approach and encompasses the following constructs of activities, online teaching material, blended learning management, creativity-based learning, metacognitive reflection, learning materials/websites, online tasks, e-learning, online discussions, independent learning, critical thinking, lecture, face-to-face learning, electronic learning, subjectivity, resource, access to computers, internet connection, ICT skills, cognitive development, spiritual development, usefulness, closeness, communication, applicability, motivation, affective attitude, cognitive attitude and behavioural attitude, self-efficacy, intrinsic orientation, performance orientation, metacognitive awareness, self-management. Anthony Jr. et al. (2022) also identified learning motivations, attitudes, communication, availability to access, and self-efficacy for students as constructs of theories related to the adoption of blended learning.

CONCLUSION

In conclusion, this systematic review paper intends to provide information on the student-teachers' learning through the Blended Learning Approach. It gives an overview of the year, nations, methods, tools, and constructs of the blended learning approach. One may say that blended learning is an effective teaching strategy in teacher education for the instruction of students. Online learning is combined with traditional classroom training in a blended learning method. This helps learning to become engaging and pleasant. The use of blended learning allows student-teachers to expand their creative abilities. By using a variety of techniques in teaching the student-teachers reflect on their own learning and grow as independent learners, they are also capable of growing spiritually and intellectually. In addition

to learning the course materials, they also build innovative skills and throughout the course of learning, student-teachers also develop self-management abilities.

SUGGESTIONS FOR FUTURE RESEARCH

Some suggestions for future researchers include:

1. Further studies on blended learning from different online and offline libraries should be added to this study's scope in future research in order to further explore the topic.
2. It would be beneficial to replicate this study with different student groups for future studies.
3. Further research can be done to examine the sample size of student-teachers and the length of the intervention of the Blended Learning Approach.
4. Future studies can look into the different blended learning models used for student-teachers' learning.
5. Studies can also be done on the opinions and attitudes of student-teachers regarding Blended Learning Approach.

RECOMMENDATIONS

When it comes to research on blended learning practices in student teacher learning process, blended learning provides insightful information. This study pinpoints the elements that motivate educators, administrators, and students to embrace blended learning. The blended learning approaches that will be used include in-person activities, pedagogy, content, and knowledge for lecturers; and information, resources, assessment, and feedback for student teachers. This consider basically centered on prevalent online databases for collecting articles (that is, ERIC, Elsevier, Emerald, JSTOR, Nature, Sage, Springer Link, and Taylor and Francis).

SUBMISSION DECLARATION AND VERIFICATION

This paper is the authors' original review work, and neither has been previously published nor under consideration for publication elsewhere in any form.

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