THE NEED AND EFFECTIVENESS OF MICROLEARNING IN TEACHER EDUCATION: A SYSTEMATIC LITERATURE REVIEW

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Teacher education has become an important concept all over the world. Simultaneously fostering students with a balanced personality has also become an important topic. There is an enormous necessity for gaining knowledge, attitudes, skills, and proper training for students. In the process of developing a student with a balanced personality, the teacher plays an intermediate role. Therefore, teacher development can be considered a timely topic to be researched. Integrating innovative and novel technologies into teacher education has become an emerging trend. Even though student teachers are considered as learners, they have multiple roles to be played as adult learners. They are expected to attend other life commitments while engaging in learning. So, teacher education should be flexible. Open and Distance Learning (ODL) and Blended Learning (BL) are used in several contexts to maintain a flexible learning environment for learners. However, there are challenges faced by learners in ODL and BL contexts, such as work and study imbalance, financial challenges, and higher levels of burnout, higher attrition rate, and emotional imbalances. These challenges would negatively affect the overall well-being of learners. microlearning can be utilised in BL and ODL contexts to address these challenges by providing flexible work arrangements and promoting a culture of work-life balance. This research study investigated the need for integrating microlearning into teacher education, and the effectiveness of microlearning integration in teacher education in the ODL context. Exploring need and effectiveness was achieved through a systematic literature review using 12 articles published in the past nine years. Data was analysed using a qualitative content analysis method. It was found that a lack of time, motivation and active engagement, efficiency, interactivity and disengagement, skills to integrate technology (with 4.0 technology), and retention, and the complex content of courses and inferior academic performance are factors to be considered for using a new technology-mediated method as microlearning. It was found that integrating microlearning into teacher education is effective as it enhances student-teacher motivation, performance of students, intrinsic motivation, engagement, self-regulated learning, flexibility, and stress-free learning. Moreover, it can be used in both face-to-face and online learning sessions.

Keywords: microlearning, Teacher Education, ODL context, Blended Learning

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INTRODUCTION

Teacher training programmes in the Open and Distance Learning (ODL) context seek to provide long-lasting improvements in the quality of teaching and learning for teachers to address the growing demand for continuing professional development of practicing teachers (Shohel, 2012). According to the Commonwealth of Learning, ODL is the provision of distance education opportunities in ways that seek to mitigate or remove barriers to access, such as finances, prior learning, age, social, work or family commitments, disability, incarceration, or other such barriers. "Open" refers to a commitment that removes any unnecessary barriers to access learning. "Distance" education refers to teaching and learning that temporarily separates teacher and learner in time and/or place; uses multiple media for delivering instruction; and involves two-way communication and possibly occasional face-to-face meetings for tutorials and learner–learner interactions. Open learning is not the same as distance learning, but they are complementary. Hence, the two terms are often used together as "open and distance learning".

According to the Commonwealth of Learning, Blended Learning (BL) involves a combination of online and face-to-face learning experiences. Some examples of BL are flipped classrooms, online interactions followed by face-to-face teaching, and online learning supplemented by a face-to-face practicum. Given the appropriate design and tenable theoretical justifications, blended and distant teacher education is poised to grow in significance within the teacher education field (T. Perry et al., 2021). BL, the combination of face-to-face and online learning, is increasingly adopted by educational institutions worldwide in teacher education (Nikou, 2019). However, the intensity of student engagement in online activities varies. To guarantee that students' knowledge and abilities continue to develop even in situations where face-to-face interaction is not feasible, online resources have included discussion boards, chat rooms in virtual learning environments, video and voice-over supplements for PowerPoint presentations, and discussion boards.

Microlearning was found to be effective in ODL and BL contexts (Sathiyaseelan et al. 2024). Allela et al. (2020) states that microlearning is the use of brief learning activities and well-planned, bite-sized (chunked) learning. Social media, gamification, applications, videos, and infographics may all be used to deliver microlearning. Several studies show the advantages of microlearning, which allows for the quick delivery of lessons (Mohammed et al., 2018). Further, they emphasise micro learning as an electronic-based learning medium that offers learning content in short, targeted chunks. The content can be in the form of audio, video, or a combination of the two with a duration of 3-5 minutes (Yuniarsih et al., 2022). It is accessible from anywhere, at any time. microlearning is adaptable to meet the needs of teacher-students. Students can select the necessary, desired, and pertinent material when it is presented in brief form. Students' understanding and retention rates rise when they use micro learning.

Garshasbi et al. (2021) emphasise that micro learning may be customised to meet the needs of individual students and is adaptable enough to accommodate several learning modalities. This method can overcome challenges such as a lack of participation and motivation in a BL context. They further state that microlearning can be applied in diverse learning contexts, such as face-to-face, 'flipped' classrooms, online, and/or BL platforms.

Liu and Li (2022) point out that educators can provide teacher-students the freedom to select brief, important, desirable, and pertinent information by making it available to them. Microlearning improves retention and comprehension in students. Both teachers and students are more likely to retain what they have learned when teaching is broken down into easily understood chunks. The influences of microlearning on teachers in the ODL context can also more easily stay up to speed on material and be aware of learning objectives (Sezaki et al., 2023). Findings suggest that microlearning has the potential to improve learning outcomes and enhance participant engagement (T. Perry et al., 2021).

This research aimed to investigate the effectiveness of using microlearning in BL and ODL contexts. Additionally, the study examines the need of integrating microlearning with new technologies in teacher education in BL and ODL contexts. This study is expected to provide a valuable insight on microlearning with integrating new technological tools as new method that can be employed in teacher education.

1. To identify the need for integrating microlearning into teacher education in the BL and ODL contexts; and
2. To examine the effectiveness of integrating microlearning strategies into teacher education in the BL and ODL contexts.

METHODOLOGY

Pati & Lorusso (2017) emphasised that a systematic literature review (SLR) is a research methodology to collect, identify, and critically analyse the available research studies (eg, articles, conference proceedings, books, dissertations and so on) through a systematic procedure. SLR can update a reader with current literature about a topic. This systematic review was reported by the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) statement.

The process of searching articles was started in December 2023 by consulting digital databases such as Science Direct, Wiley Online Library, and Google Scholar. It limited the publication dates to range from 2015 to 2024 (i.e., articles published in the last nine years), which can provide recent literature. Following are the research strings that were applied for the literature search:

1. "microlearning" ("Open and Distance Learning", "Blended Learning", and "teacher education");
2. "microteaching" ("Open and Distance Learning", "Blended Learning", and "teacher education"); and
3. "microlearning" ("Blended learning" and "teacher education").

Keywords such as "teacher education in blended learning", "effectiveness of microlearning in blended learning", and "need for microlearning in blended learning in ODL context" were used to identify relevant literature.

Inclusion criteria: the research papers were searched through the application of the above-mentioned keywords and search strings.

There were some exclusion criteria, which were as follows:
1. Papers that found common in all the digital databases (EC1);
2. Papers that discuss teacher education generally, and not in the ODL and Online Blended Learning (OBL) (EC2);
3. Papers that discuss microlearning or micro learning but not in the context of teacher education (EC3); and
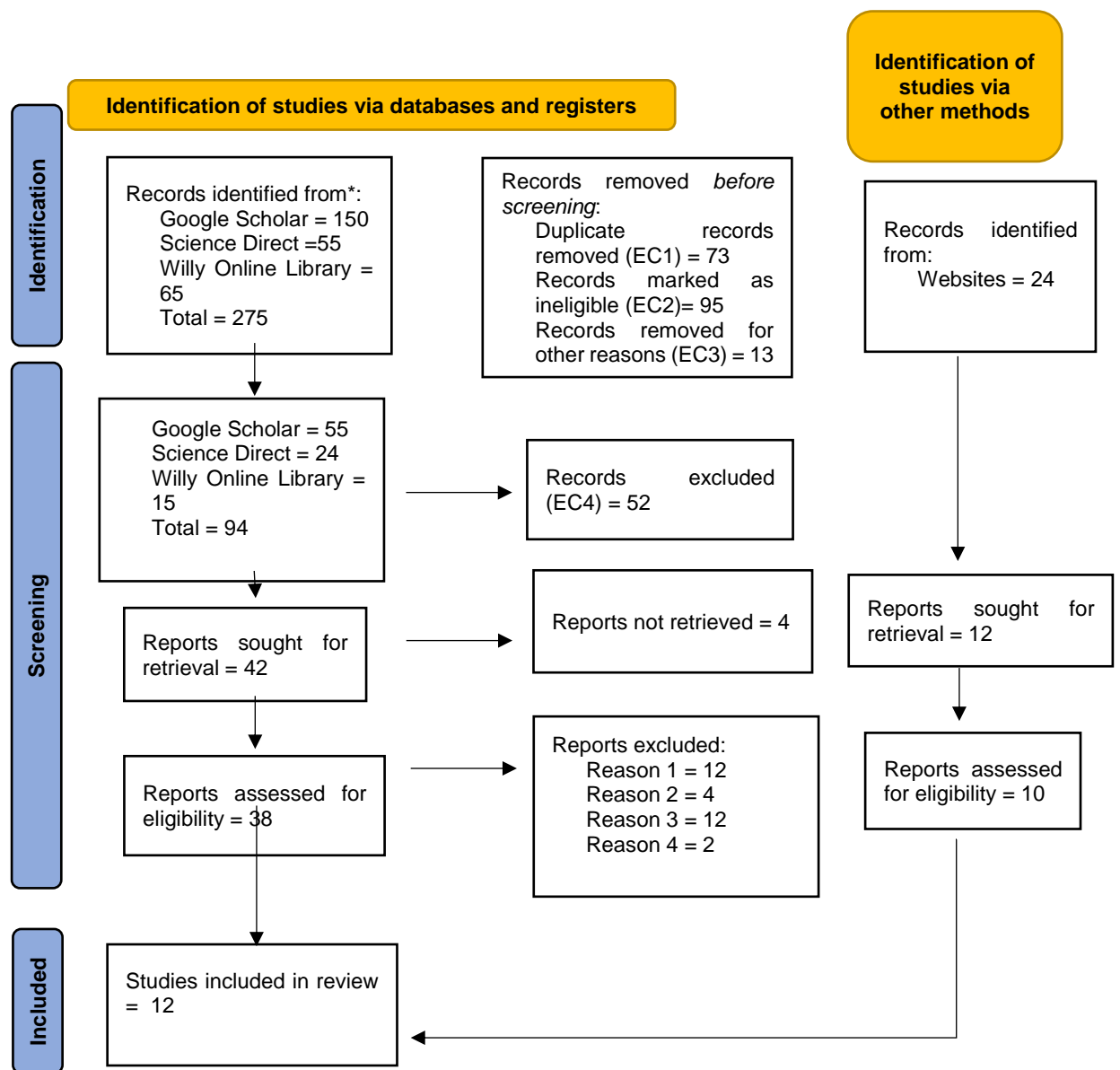
4. Papers that discuss teacher education in OBL and ODL contexts, but do not discuss microlearning or micro learning (EC4).

Inclusion criteria

The inclusion criteria for the selection of research articles for the current systematic review was limited to only those that discuss micro learning or microlearning for teacher education in the ODL and OBL contexts.

The studies for the systematic review were recognised through online databases such as Google Scholar, Science Direct, and Wiley Online Library. All the searches were limited to the period between 2015 and May 2024, and were random online searches. The analysis was conducted by looking at each article's abstract, title, and relevant keywords. According to the above-mentioned exclusion criteria, after applying them in the searches, only 32 research articles were found, which were further taken for full-paper review. Thus, a total of 12 articles were identified after the application of all exclusion and inclusion criteria.

Identification of studies via databases and registers

Identification of studies via other methods

Identification

Records identified from*:
Google Scholar = 150
Science Direct =55
Willy Online Library = 65
Total = 275

Records removed *before screening*:
Duplicate records removed (EC1) = 73
Records marked as ineligible (EC2)= 95
Records removed for other reasons (EC3) = 13

Records identified from:
Websites = 24

Screening

Google Scholar = 55
Science Direct = 24
Willy Online Library = 15
Total = 94

Records excluded (EC4) = 52

Reports sought for retrieval = 42

Reports not retrieved = 4

Reports sought for retrieval = 12

Reports assessed for eligibility = 38

Reports excluded:
Reason 1 = 12
Reason 2 = 4
Reason 3 = 12
Reason 4 = 2

Reports assessed for eligibility = 10

Included

Studies included in review = 12

Note(s): PRISMA flow diagram for new systematic reviews, which included searches of databases, registers, and other sources (*PRISMA 2020 Flow Diagram — PRISMA Statement*, n.d.)

The finally identified research studies were analysed, and it was identified that though research studies were focusing on microlearning, microteaching, and microlearning in other disciplines, those that focussed on microlearning in BL and ODL contexts were less in the area of teacher education. Based on the selected articles, extraction and analysis were performed according to the research objectives to obtain a comprehensive picture of the need and effectiveness of using microlearning in teacher education. So, in the present study, the researchers focused on research that especially focussed on teacher education in the ODL and BL contexts.

RESULTS AND DISCUSSIONS

The need for integrating microlearning into teacher education in the ODL context

Traditional teaching methods often face challenges such as time constraints, increasing course content, and a focus on exams rather than conceptual understanding. To address these challenges and enhance teaching effectiveness, there is a growing emphasis on integrating innovative pedagogical approaches like microlearning into teacher education programmes. Ahamed (2017) and Noor (2014) shed light on the persistent challenges faced in traditional teaching methods, including a lack of time due to curriculum constraints and the increasing content of courses. Moreover, the traditional paradigm often prioritises exams and results over deep understanding and conceptual clarity among students. These challenges underscore the need for pedagogical shifts that prioritise active learning, critical thinking, and student engagement.

BL, which combines traditional face-to-face instruction with online learning components, has gained traction as a viable approach to address the limitations of traditional teaching. Nikou (2019) points out that despite the advantages of BL, stimulating students' motivation and active engagement remains to be a challenge. This is where microlearning strategies can play a crucial role. Microlearning involves breaking down teaching into small, manageable segments, allowing educators to focus on specific teaching skills and receive feedback for improvement. The proposed model by Nikou (2019) aims to enhance student and teacher motivation and engagement in BL through micro learning interactions. This model emphasises the importance of supporting content-learner, teacher-learner, and learner-learner interactions in online environments, thereby fostering a more dynamic and participatory learning experience.

Several empirical studies provide evidence of the effectiveness of microlearning in various educational contexts. Kohnke et al. (2023) conducted a study on teacher professional development (TPD) using microlearning and found that it was perceived as being flexible, stress-free, and conducive to focusing on immediate tasks. This flexibility and focus on bite-sized learning segments are particularly valuable in digital environments where attention spans may be shorter, and learners require quick access to relevant information. Similarly, Shamir-Inbal and Blau (2020) explored self-regulated learning processes in a micro learning, blended TPD course for ICT teachers. Their findings highlight the benefits of micro learning in providing practical knowledge and confidence to teachers, and thus creating favourable conditions for equipping them with the necessary skills for online and BL environments.

Yang (2020) argues that the traditional microlearning method may be inferior in terms of academic performance. To address this, a traditional teaching method based on microlearning and BL was proposed. The experiment conducted showed that students' performances in the traditional micro class teaching setting based on hybrid learning was higher compared to traditional teaching methods. This highlights the significance of the practical application of integrating microlearning strategies into teaching practices, especially in digital and BL contexts.

In the context of ODL, the integration of microlearning strategies becomes even more critical. Allela et al. (2020) discuss the integrated in-service teacher training (INSET) programme in which micro learning is identified as an ideal mode for delivering toolkit content to teachers. The use of mobile apps, online resources, and collaborative platforms like WhatsApp showcases the adaptability and effectiveness of microlearning in ODL environments. Liu and Li (2022) emphasise the benefits of microlearning in mobile-based education. The design of microlearning content that can be accessed through mobile devices has gained attention due to its accessibility and ease of use. The interactive and self-directed nature of microlearning aligns with the diverse learning needs of ODL students and educators, making it a valuable tool for enhancing learning outcomes and fostering engagement. The above-presented literature highlights the need of integrating microlearning strategies into teacher education within the ODL and BL contexts.

The effectiveness of integrating microlearning strategy into teacher education in the ODL context

Hang and Xu (2015) emphasised that micro lectures are a suitable option for BL and can be used to meet the needs of a variety of learners as it allows students to use mobile devices to learn anytime anywhere. Students can work cooperatively and with peers, adapting their learning speed to fit their schedules. In contrast to a traditional paced learning schedule, learning through micro lectures offers flexibility in learning time, improving learning management. Most students think that course modules that are used in the ODL context are boring to read and their content is hard to understand. Learning became appealing, engaging, and enjoyable when micro lectures were incorporated, and the majority of students reported having a satisfactory learning experience.

Nikou (2019) conducted a research study by using the Self-Determination Theory (SDT) of motivation as its theoretical framework, and proposed a microlearning-based BL model to support pre-service and in-service teachers' education. This model enhanced student-teachers' motivation in BL contexts by incorporating microlearning that supports learner-content, learner-instructor, and learner-learner interactions. The proposed micro learning-based BL approach can be autonomy supportive since it provides students with self-contained, small, manageable learning units and tasks that can also be personalised and adapted to learners' needs and preferences.

Kohnke et al. (2023) conducted a research study focussing on pre-service teachers (PSTs) in Hong Kong who participated in a short Teacher Professional Development Course via microlearning. The study aimed to explore the effects of microlearning and its ability to create the conditions for professional digital competence in teachers' future practices. 32 pre-service English language teachers studying at either primary or secondary education levels participated in the study. It revealed that microlearning was able to boost pre-service teachers' confidence in utilising digital tools to facilitate English language learning. It showed that microlearning courses allowed pre-service teachers to select the content that met their needs, contributing to a sense of autonomy.

According to Garshasbi et al. (2021), microlearning empowers learners through a reduced cognitive overload, improved self-management and motivation, heightened engagement, and reduced development time and costs. Microlearning can be applied on diverse learning platforms, such as face-to-face, 'flipped' classrooms, online, and/or BL settings. It encourages learners' motivation and fosters a practice of lifelong learning by providing learning flexibility and autonomy. Nidhi et al. (2023) conducted a research study to assess the status in India of teachers' use of microlearning strategies for professional development. Thirty-two school teachers in the Kerala state in the age group between 35 and 50 years participated in the study, and they were part of the EDUREFORM Teacher training programme at Kochi. The study shows that microlearning is an effective tool that can cater to the needs of the teacher for on-demand continuous professional development.

Ahamed (2019) emphasised that dividing the course content into tiny parts and used through WhatsApp, within a hybrid mode of learning through small steps, helps learners to gain high marks at exams and better understand and learn the course material. Further, it –better supports preparation for examinations, and uplifts the traditional face-to-face process of lengthy and tiresome learning, as it supports learners to gain in-depth ideas about the course material. Allela et al. (2020) conducted a study to examine the effectiveness of the integration of a microlearning strategy into the school-based Teacher professional development programme at the Freetown Teachers Training College (FTC) in Sierra Leone. A multimodal approach was considered and the dissemination of the SBTD toolkit contents, the microlearning resources, were presented as short videos, short audio clips, images, quick reading materials, brief quizzes, and the requirement to contribute to discussion threads. It was shown that microlearning can

enhance the life-long learning, fragmented learning, and self-learning. A research study by Sezaki et al. (2023) emphasise that online microlearning utilises technology in both synchronous and asynchronous settings. Online microlearning is the same as or superior to the face-to-face environment in terms of competence development, self-efficacy and motivation, flexibility and convenience, evaluation and feedback, and engagement and enjoyment.

Analysis of the findings from the presented studies indicates that the use of microlearning is an effective strategy that can be integrated into the teaching-learning process in the BL and ODL contexts. It was found through the literature that a lack of time, motivation and active engagement, efficiency, interactivity and disengagement, skills to integrate technology (with 4.0 technology), and retention, as well as the complex content of the courses and inferior academic performance, are factors behind the need for using microlearning in teacher education.

It enhances teaching effectiveness by addressing challenges in traditional methods, promoting professional development, and supporting the dynamic demands of modern education. By leveraging microlearning and microlearning approaches, educators can create engaging and effective learning experiences that cater to the needs of learners in digital environments.

Overall, these findings underscore the significant potential of microlearning strategies in enhancing learning experiences, motivation, and professional development across diverse educational settings. ODL environments present unique challenges for teacher education, including limited face-to-face interaction and diverse student populations. Therefore, innovative pedagogical strategies are required to effectively prepare teachers for these contexts. The need for adaptability and creativity in teacher preparation techniques in BL and ODL environments makes microlearning a potentially useful tool for improving remote teaching capacities.

CONCLUSIONS/RECOMMENDATIONS

Based on findings from the series of studies discussed, it can be concluded that microlearning or bite-sized learning has become a new trend in teacher education (Gray, 2015). This type of learning is facilitated through active tasks that are carried out within participants' regular work. Although traditional teachers concentrated only on teacher-centred learning, there was a good society in the past with well-behaved students. In current society, as we can observe that although students are in a knowledge-blasted society, there is a lack of good attitudes in students. Teachers play the intermediate role between students' personality development and provision of education. Thus, teacher education is an important area to be developed with innovative ideas.

Pre-service and in-service teachers in ODL and BL face many challenges. Ooi and Othman (2023) highlight that ODL students have several implications and suggest that it is essential to develop policies that support ODL students, such as offering financial incentives, providing flexible work arrangements, and promoting a culture of work–life balance. When flexible work arrangements and promoting a culture of work-life balance are considered, microlearning can be seen as an emerging trend in teacher education to overcome such challenges. The current research focussed on the need and effectiveness of bite-sized teaching in teacher education in BL and ODL contexts.

As shown in the literature, BL also has its weaknesses. Thus, this systematic review concludes that time constraints, increasing course content, and a focus on exams rather than conceptual understanding are some of the challenges faced in traditional teaching methods, Lack of time due to curriculum constraints and the increasing content of courses, stimulating students' motivation and active engagement challenges in BL, lack of supporting the dynamic demands of modern education, work and study imbalance, financial challenges they face can increase their stress are some of other challenges in BL. Higher levels of burnout in traditional teaching contexts also lead to a higher attrition rate. The emotional stress that students face can

impact their overall well-being. Overall, all previously mentioned issues in BL and ODL can be concluded to be some reasons why it is essential to grasp bite-sized teaching methods in teacher education.

According to this review of literature, it was found that a range of factors show microlearning to be an effective method to integrate into teacher education. This is because it allows students to use mobile devices to learn anytime anywhere; students can work cooperatively and with peers; and adapt their learning speed to fit their schedules. In contrast to a traditional paced learning schedule, learning through micro lectures offers flexibility in learning time; improves learning management; provides self-contained, small, and manageable learning units and tasks that can also be personalised and adapted to learners' needs and preferences. Moreover, microlearning contributes to a sense of autonomy, providing learning flexibility, better understanding and learning of course material, supporting better preparation for of the examinations, and uplifting traditional face-to-face processes of lengthy and tiresome learning by supporting learners to gain in-depth ideas about the course material and evaluation and feedback. Engagement and enjoyment are also reasons for ease of use this method.

So it can be concluded that microlearning is simpler for student-teachers to update information and understand learning outcomes when the material is divided into manageable chunks, and it is also easier for them to retain the lessons. Even though BL is used worldwide in the education system, integrating microlearning is an enjoyable, motivating, and flexible technique to enhance the retention of student-teachers and their academic performance. This can be employed in the ODL context effectively. Further research should be conducted on the new technological tools that can be used to integrate this strategy to reach student-teachers in an effective way.

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