RESEARCH ARTICLE

Empowering Preservice Teachers: A Mentored Blended Learning Approach with MOOCs to Elevate Skills and Self-Efficacy

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ABSTRACT

This research explored the evolving needs and preferences of preservice teachers and their teachers in a mentored blended learning model supplemented with Massive Open Online Courses (MOOCs). The primary objectives included understanding these educational stakeholders' requirements, developing an effective mentored blended learning with MOOCs model, and evaluating its impact on the teaching skills and self-efficacy of 40 third-year preservice teachers specializing in preschool education. Feedback from 15 participating teachers was also gathered. Employing a mixed-methods approach, this study utilized an experiment for preservice teachers and an interview schedule for their teachers. Quantitative analysis revealed a significant shift in preferences, where a mentored blended learning with MOOC model was considered the best approach to teaching preschool education-selected content. Preservice teachers strongly desired to utilize MOOCs to better understand training content and preferred the new model over traditional teaching methods. They sought more systematic, comprehensive knowledge closely linked to classroom teaching practices. There was a clear demand for extensive learning resources and a more interactive, supportive learning environment with timely mentor feedback. Additionally, preservice teachers were keen on honing their teaching skills, particularly in adapting to teaching and mastering teaching-learning strategies. The study also incorporated feedback from expert teachers, who contributed valuable insights for refinement. Overall, this research highlights the potential of the Teaching Model Version 3.0 to address the changing needs of preservice teachers and improve their skills and self-efficacy in preparation for internship placements.

INTRODUCTION

Massive Open Online Courses (MOOC), a relatively recent innovation in web-based distance learning programs, represent a substantial departure from traditional teaching methods and offer an alternative avenue for interactive education (MOI, 2015). The term "massive" signifies the vast array of courses

available, while "open" indicates accessibility to a geographically diverse student population. Online courses, where instruction and learning take place via the Internet, have gained global prominence in recent years.

Online education has experienced significant growth and acceptance worldwide. However, MOOCs represent a relatively recent phenomenon in online education, designed to promote open online educational resources. MOOCs are considered a potential game-changer in educational technology, seamlessly blending with traditional teaching and learning approaches to meet the demands of the technology-driven 21st century and the fourth industrial revolution (Virani et al., 2020).

The pandemic compelled universities worldwide to transition to online teaching, resulting in the widespread adoption of various internet-based teaching tools and online educational resources, including Massive Online Open Courses (MOOCs) (Chakraborty et al., 2021; Al Kaabi et al., 2021). MOOCs, in particular, provide free, high-quality course content from prestigious global universities, democratizing access to higher education for learners of all ages, backgrounds, and geographic locations (Deng et al., 2019). For learners in economically disadvantaged regions (EDR), where access to quality course materials is limited, MOOCs promise to bridge the knowledge gap on a global scale (Ma and Lee, 2019).

During the pandemic, MOOC enrollments surged worldwide, and it is anticipated that MOOCs will continue to play a pivotal role in higher education beyond the pandemic (Ma and Lee, 2023; Rahman et al., 2023). However, leveraging MOOCs presents challenges related to technology, social dynamics, and financial constraints, which require thoughtful consideration. Self-efficacy among students pertains to their perceived ability to perform specific tasks (Rodriguez and Armellini, 2017; Ayub et al., 2021).

In recent times, universities have embraced massive open online courses (MOOCs) to examine learners' self-efficacy (Hood et al., 2015). Bandura (1994) introduced the concept of self-efficacy, which centres on people's beliefs about their capacity to achieve desired outcomes. This notion wields substantial influence as a potent predictor of academic performance and learning (Aurah, 2013), demonstrating a positive association with student retention (Street, 2010). Beliefs entrenched in self-efficacy profoundly affect one's emotional state, cognitive processes, behaviors, and self-propelled motivation (Bandura, 1994).

Students with elevated self-efficacy exude assurance in their aptitude for success, demonstrating self-motivation, self-regulation in their learning endeavours, and a reduced reliance on external guidance. Moreover, they exhibit resilience in confronting obstacles and achieving their goals with notable proficiency. Conversely, students who harbour diminished self-efficacy grapple with uncertainty regarding their potential for success, occasionally perceive intelligence as immutable, grapple with procrastination tendencies, and frequently attain suboptimal academic outcomes (Wäschle et al., 2014). Educators have continuously explored innovative ways to understand the learning process to equip students for success in an ever-changing society. Heutagogy, a pedagogical concept, posits that learners possess autonomy and self-determination in their educational journey. This approach strongly emphasizes fostering competencies, which are the skills and knowledge acquisition abilities and capabilities that reflect one's confidence in their competencies. A competent and self-determined individual is likely to demonstrate a strong sense of self-efficacy (Blaschke, 2012; Bilal et al., 2022).

Related studies

In their commitment to nurturing students' self-efficacy, higher education institutions have meticulously crafted and put diverse strategies and initiatives to provide comprehensive support and guidance into practice. These multifaceted approaches encompass a wide spectrum of resources, programs, and interventions, all dedicated to fostering and enhancing students' self-belief in their capabilities and competence. The results of research conducted by Rodriguez and Armellini (2017) revealed notable statistical improvements in overall self-efficacy after the completion of the MOOC. Additionally, there were marked increases in perceived self-efficacy related to five out of six study skills. The findings underscore participants'

recognition and appreciation of their personal growth. MOOCs are low-stakes developmental platforms for students, offering opportunities to expand their knowledge and enhance their self-efficacy. For academic institutions, strategically crafted MOOCs focusing on study skills are valuable tools for supporting their students. Shao and Chen (2021) found that MOOC-based blended learning designs helped provide help and resolve problems. Applying MOOCs to blended learning is conducive to promoting qualified learning resource sharing and educational equity, deepening classroom reforms, and improving learning efficiency. In a research study conducted by Uştuk et al. (2022) in Turkey, it was discovered that MOOCs offer significant opportunities for the professional development of language instructors. These opportunities arise when MOOCs prioritize key aspects such as self-regulation, assessment of learning, and reflective teaching practices. Conversely, it's worth noting that MOOCs can present learning challenges when their content, typically tailored for a general audience, needs to align more effectively with individual participants' unique needs and specific teaching contexts.

Research questions

- What are the needs of students and teachers toward mentored blended learning with MOOCs?
- Do the preservice teachers who learn with mentored blended learning in the MOOC model show higher self-efficacy than those who learn with conventional teaching?
- 3. What is preservice teachers' satisfaction after completing the mentored blended learning with MOOC model?

Objectives

- To determine the needs of students and teachers towards the mentored blended learning with MOOC model.
- To determine the effects of the mentored blended learning with MOOC model on preservice teachers' self-efficacy.
- To investigate preservice teachers' satisfaction of the mentored blended learning with MOOC model.

METHODOLOGY

Design

It was a mixed-methods research project where, on the quantitative side, the experiment was conducted and, on the qualitative side, an open-ended interview approach was utilized to determine the needs of students and teachers towards blended learning with MOOC model and to investigate preservice teachers' satisfaction with the mentored blended learning with MOOC model. The experiment was conducted to determine the effects of mentored blended learning with MOOC model on preservice teachers' skill and self-efficacy. A post-test, and experimental design were used for the experiment.

Participants

80 preservice teachers were randomly selected from 242 third-year students majoring in preschool education, and 15 teachers teaching them were randomly selected from 25 teachers. 80 preservice teachers were randomly assigned to each control and experimental group.

Research instruments

A post-test experimental design was used to carry out the experiment. A simulated teaching test was designed to be used in both control and experimental groups. Used the International Comparative Analysis of Learning and Teaching (ICALT)24-items version (van de Grift et al., 2019) to measure preservice teachers' teaching skills. Furthermore, used the short 12-item version of Teachers' Sense of Efficacy Scale (TSES) (Tschannen-Moran and Hoy, 2001) to measure preservice teachers' self-efficacy levels. The training course lasts for four weeks, three hours per day, and three days a week. The average age of the students was 20-23 years. The researchers considered several factors to ensure the experiment was valid and produced meaningful results. These factors included providing adequate students in each group, avoiding situational bias, and promoting group homogeneity. A one-item open-ended questionnaire was also administered to preservice teachers, asking them to mention the top five benefits derived by students from the mentored blended learning approach used with the MOOC model in the experiment.

Treatment

40 preservice teachers were taught selected preschool education content using mentored blended learning

with MOOC model. The following activities were also employed:

- Writing lesson plans
- Participate in microteaching training
- Engaging in video activities and writing teaching case analysis
- Discussing with mentor and group members
- Listening to real-life teaching stories and anecdotes
- Writing reflection report

As a motivating factor, participants in the study were given a certificate upon completing the course. Experts reviewed the treatment's content. One of the researchers acted as the interventionist, also a faculty member of the University. The application of a standardized intervention protocol was done. Measures were undertaken to minimize treatment contamination. The control group was taught the same content using the traditional method.

RESULTS

Development of the achievement test

During the planning phase, the research team identified the intended learning objectives, selected relevant topics from the preschool education contents to meet these objectives, and ensured a balanced representation of objectives across the cognitive, affective, and psychomotor domains. They also determined the number of test items needed to effectively cover the topics to be assessed. To facilitate this process, a table of specifications was created to link each topic with its corresponding behavioural objective. The cognitive goals came from Thomas's (2005) list of verbs, the affective goals from Waller's (2008) list of action verbs, and the psychomotor goals from the University Assessment Services (2015). Active verbs were used to write the behavioural goals.

Table 1: Comparison of control and experimental groups post-test performance(*n=40*)

DV	Descriptive statistics	Experimental group	Comparison	Control group
Teaching skill	Means	80.65		73.7
	SDs	5.1		6.35
	Difference (E minus C)		6.95	
Self-efficacy	Means	47.9		41.07
	SDs	4.11		5.3
	Difference (E minus C)		6.83	

The average scores of the experimental and control groups on the teaching skill test after the intervention were 80.65 and 73.7. These scores indicate the skill levels of both groups after the intervention. The standard deviations for the scores were 5.1 for the experimental group and 6.35 for the control group. These values represent the variability in the teaching skill test scores within each group. After the intervention, the experimental group had an average score of 47.9 on the self-efficacy test, while the control group had an average score of 41.07. These scores indicate the self-efficacy levels of both groups after

the intervention. The standard deviation for the post-test scores was 4.11 for the experimental group and 5.3 for the control group. These values represent the variability in the self-efficacy test scores within each group. Thus, the experimental group showed a more significant skill improvement of 6.95 points and self-efficacy enhancement of 6.83. The mentored blended learning approach with MOOC model had a significant positive effect on the teaching skill and self-efficacy performance of preservice teachers compared to traditional teaching methods.

Table 2: Top 5 Benefits derived by students from Mentored Blended Learning Approach used with the MOOC Model

Benefits Derived by Preservice Teachers	Percentage
Improved teaching skill and self-efficacy	89%
Awareness of strengths and weaknesses	86%
Increase in the value of the overall education received from the university	84%
Application of positive thinking techniques	82%
Application of strategies for creating personal presence (personality development)	80%

The table above presents the top five benefits students have garnered from participating in the experiment. An overwhelming majority of participants, precisely 89%, reported a notable boost in their teaching skill and self-efficacy. Additionally, 86% of respondents expressed that they gained a heightened awareness of their strengths and weaknesses due to participating in these workshops. Moreover, 84% of participants attributed an increased value to their overall education, thanks to the valuable insights and learning acquired during the experiment. Remarkably, 82% of respondents disclosed that they have successfully incorporated positive thinking techniques into their daily lives, a skill acquired through these workshops. Furthermore, 80% of participants reported that they have begun to apply strategies for enhancing their personal presence, showcasing the tangible impact of mentored blended learning using the MOOC model.

FINDINGS

The qualitative findings for both the needs of students and teachers towards blended learning with MOOC models and the satisfaction of preservice teachers in the context of mentored blended learning are given here:

Needs of students and teachers towards mentored blended learning with MOOC model

Flexible learning opportunities: Many teachers acknowledged that today's students, including preservice teachers, have increasingly busy lives with various commitments. They emphasized the need for learning models that can adapt to these schedules. Blended learning with MOOCs was seen as a solution that allows students to engage with course materials and assignments at their convenience, accommodating part-time jobs, family responsibilities, and other commitments.

Customization and personalization: Teachers recognize that each student has a unique learning style and pace. They highlighted the importance of MOOCs, which offer various resources and content options, enabling teachers to tailor their teaching to meet individual needs. This personalization was seen as essential in training course, where preservice teacher's skill develop at different rates.

Support and guidance: Effective support systems were a recurring theme in the interviews. Teachers stressed that for blended learning with MOOCs to succeed, there must be clear communication channels and readily accessible assistance for technical or content-related issues. They also discussed the importance of emotional support, particularly for preservice teachers struggling with the digital learning environment.

Engaging Content: Teachers underscored the significance of learning content closely related to real classroom teaching. They believed that MOOCs should offer comprehensive and appropriate materials, including videos and cases, to maintain students' engagement and motivation.

Assessment and progress tracking: Interviewees recognized that effective assessment and progress tracking are essential in any learning environment. They advocated for MOOCs to incorporate features that allow teachers to monitor students' progress and offer timely feedback. This data-driven approach can help identify areas for improvement and ensure that learning objectives are met.

Digital literacy training: Some teachers acknowledged that not all students and educators possess the same level of digital literacy.

They recommended including digital literacy training as part of the blended learning experience, helping students and teachers become more comfortable and proficient in using technology for educational

purposes.

Preservice teachers' satisfaction with the mentored blended learning with MOOC model

Positive impact on teaching skills: Preservice teachers shared their experiences of feeling more confident and competent as educators after participating in mentored blended learning with MOOCs. They noted that the experience had expanded their pedagogical toolkit and prepared them to meet the evolving demands of modern education.

Effective mentorship: The presence of mentors received high praise from preservice teachers. They found mentors to be crucial guides who offered valuable insights, feedback, and encouragement. Having a mentor helped them bridge the gap between theory and practice, making them feel more prepared for their future teaching roles.

Resource accessibility: Preservice teachers appreciated the abundance of resources available through MOOCs. These resources included lesson plans, teaching materials, and research articles, which they found immensely helpful for their lesson planning and curriculum development efforts. Access to a wide range of resources was seen as a significant advantage.

Collaborative learning: Some preservice teachers described the benefits of collaborative learning within MOOCs. Online forums, group discussions, and peer-to-peer interactions allowed them to exchange ideas, learn from each other's experiences, and gain diverse perspectives. Collaborative learning fostered a sense of community and professional growth.

Challenges in technology integration: A few preservice teachers admitted that integrating technology smoothly into their teaching practices posed challenges. They requested more specific guidance and training on effectively incorporating MOOC materials into their preschool classrooms. This highlighted the need for comprehensive support structures.

Assessment and feedback: Preservice teachers expressed the need for more transparent assessment criteria and timely feedback within MOOCs. They believed that more transparent rubrics and prompt feedback from mentors would enhance their learning experiences and help them refine their teaching approaches effectively. These qualitative findings reflect the nuanced perspectives and insights teachers and preservice teachers shared during the interviews. The results underscore the multifaceted nature of blended learning with MOOCs in preschool education and emphasize the importance of addressing individual needs, mentorship, and support for successful implementation.

DISCUSSION

Students preferred the mentored blended learning (MOOC) model over traditional teaching methods for pre-internship training. The experiment confirmed this preference, with the experimental group outperforming the control group. They highlighted the need for structured, diverse, practical content, interactive discussions with mentors, and a supportive learning environment with prompt feedback. They were also interested in improving their teaching skills.

Experienced teachers stressed effective interactions, continuous feedback, technology integration, and self-improvement for better teaching. They recommended case studies, practical content, and aligned tasks to boost student autonomy and interest. Successful mentoring in blended learning required robust support, including tech tools, experienced mentors, and resource sharing. Teachers used various methods, like online discussions and feedback loops, to understand student progress and provide personalized support. Some of the research studies have similar findings as the present study.

Rodriguez and Armellini (2017) research showed significant statistical improvements in overall self-efficacy upon MOOC completion. Notably, perceived self-efficacy related to five out of six study skills also saw marked increases. These findings underscore participants' recognition of personal growth. MOOCs can serve as low-pressure developmental platforms for students, expanding their knowledge and boosting their self-efficacy. Academic institutions can strategically use MOOCs focusing on study skills to support their students effectively.

Shao and Chen (2021) found that MOOC-based blended learning designs help provide assistance and problem-solving. Integrating MOOCs into blended learning promotes the sharing of quality learning resources, enhances educational equity, deepens

classroom reforms, and improves learning efficiency. According to a study by Uştuk et al. (2022) in Turkey, MOOCs present significant opportunities for language instructors to advance their careers. These opportunities arise when MOOCs prioritize key aspects like self-regulation, assessment of learning, and reflective teaching practices.

Kormos and Nijakowska (2017) conducted a study on dyslexia students and found that participants who accomplished more tasks on the course confirmed improved post-course self-efficacy beliefs. Those who sent more comments indicated lower levels of anxiety about the application of inclusive language teaching practices.

Langseth and Haugsbakken (2016) found some different results. Their study examines the results of implementing the MOOC, revealing a low level of user adoption and a low course completion rate. The research explores whether teacher educators perceive the pedagogical benefits of MOOCs and whether teacher students possess sufficient digital proficiency to effectively utilize online learning materials within formal educational settings.

In another study, DeBoer et al. (2019) found different results. He concluded that MOOCs often lack hands-on activities. We ran an RCT within a MOOC, providing lab kits to one group. Results showed the kit group had higher exam scores and more self-efficacy. Self-concept growth didn't differ. This has implications for STEM distance education, especially in fields with labs. It also highlights the potential for improving engineering instruction. Finally, our study shows how MOOCs allow for RCTs and theory-practice connections.

In the second part of the study conducted by Uştuk et al. (2022) in Turkey, it's worth noting that MOOCs can pose learning challenges when their content, typically tailored for a general audience, doesn't align effectively with individual participants' unique needs and specific teaching contexts.

Practical and contextual implications

The study highlights that students strongly prefer the mentored blended learning (MOOC) model over traditional teaching methods for their pre-internship training. This preference suggests that educational institutions should incorporate more blended learning approaches involving MOOCs and mentorship to better align with student preferences.

Students emphasized the importance of structured, diverse, and practically relevant learning content. This implies that educators should create well-organized and varied course materials catering to different learning styles and needs.

Students' interest in interactive platforms for discussions with mentors and a supportive learning environment with timely feedback underscores the importance of creating engaging online spaces for collaborative learning. Educational institutions should consider fostering such environments to enhance student engagement.

The students' interest in developing teaching skills suggests the potential for incorporating pedagogical training within courses. This can help students improve their adaptability and mastery of teaching-learning strategies.

The study highlights the importance of effective teaching interactions, continuous feedback, and technology integration from experienced teachers' perspectives. These insights can guide teacher training programs and inform professional development efforts. It's crucial to ensure that MOOC content aligns effectively with individual participants' unique needs and teaching contexts. Course designers should consider customization options for diverse learner backgrounds and requirements.

Limitations and future directions

The study's findings are context-specific and may not be universally applicable. Different educational settings, subjects, and student populations might yield different results. Future research should explore the generalizability of these findings across diverse contexts. The study primarily focuses on short-term outcomes and preferences. Investigating the long-term effects of MOOC-based blended learning on student performance and career development would be valuable. The study assumes adequate access to technology for both students and teachers. Future research should address issues related to the digital divide and explore how to make MOOC-based learning more inclusive.

In the future, it is necessary to conduct longitudinal studies to assess the sustained impact of MOOC-based blended learning on student performance and career outcomes. This would provide a more

comprehensive understanding of the benefits and challenges of time. Similarly, exploring how the preferences and effectiveness of MOOC-based blended learning vary across different cultural and educational contexts could shed light on the cultural factors that influence its success. The researchers can conduct comparative studies between MOOC-based blended learning and other educational models to identify each approach's specific advantages and limitations in various disciplines and settings. Similarly, it is needed to explore effective strategies for training teachers to excel in blended learning environments, including MOOC integration, investigate the impact of teacher preparedness on student outcomes, and utilize advanced data analytics and machine learning techniques to gain deeper insights into student behaviours, engagement patterns, and learning outcomes in MOOCs, enabling more personalized support.

CONCLUSION

From the students' perspective, it was evident that traditional teaching methods fell within their preferences. Instead, they strongly favoured the mentored blended learning with the MOOC model for training before internships. The intervention in the form of an experiment provided the same results, where the experimental group performed better than the control group, and the results favoured the mentored blended learning with the MOOC model. They emphasized the importance of systematically structured, wide-ranging, and practically relevant learning content. Students also sought a rich array of learning resources, interactive platforms for discussions with mentors, and an encouraging learning environment with timely feedback and guidance. Additionally, they expressed a keen interest in developing teaching skills, particularly adaptability and mastery of teaching-learning strategies.

On the other hand, teachers with substantial experience emphasized the importance of effective teaching interactions, continuous feedback and guidance, technology integration, and ongoing self-improvement to enhance teaching effectiveness. They advocated for teaching case studies, practice-oriented learning content, and aligned training tasks to foster student autonomy and interest. Successful mentoring

in blended learning environments depends on robust support, including technical infrastructure, online communication platforms, experienced mentors, resource sharing, promoting student engagement, and deep learning. Teachers also leveraged various methods to understand students' progress and needs, such as online discussions, feedback loops, and group presentations, providing personalized support and feedback.

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