Blended Learning as a Tool for Enhancing the Self-efficacy beliefs of pre-service Teachers in a Teacher Education Program: A Systematic Review

Bawande Olawale[1] and Siphokazi Matshikiza[1]

[1] School of Further and Continuing Education, University of Fort Hare, Alice 5700

bolawale@ufh.ac.za

Abstract. Teacher education programs in HEIs have drawn much attention to online and blended learning models, as educators worldwide are now forced to rethink how to implement their curriculum, instructions, and assessments in an online, blended, and hybrid environment. This is because BL can be used to improve theoretical knowledge comprehension and guarantees that pre-service teachers have enough teaching practice and observation experience while minimizing the pressure on teacher education institutions and mentoring teachers. It, therefore, becomes vital that teacher educators and pre-service teachers use BL, given the continually changing nature of education and increased demand for technology in teaching and the teaching profession. Thus, this paper examined how blended learning can be used to enhance the self-efficacy beliefs of pre-service teachers in a rural teacher education program. As such, this study employed a systematic review in which a survey of literature from books, journals, and websites was undertaken to examine how blended learning can be used to enhance pre-service teacher self-efficacy in a teacher education program. The paper also examines the relationship between online technologies, self-efficacy, and pre-service teachers' satisfaction. The paper concludes that with the utilization of blended learning, pre-service teachers can cultivate a robust sense of self-efficacy, resulting in enhanced assurance and proficiency in their forthcoming pedagogical pursuits. This study recommends the need for additional research to investigate the practices and consequences of blended learning in relation to the increase of self-efficacy. This is necessary to expand the existing body of knowledge on this topic.

Keywords: Blended Learning, Educators, Pre-service, Self-Efficacy, Teacher Education.

1   Introduction

Blended learning, as defined by [1], is an educational approach that combines online content and instruction with elements of student control over the time, place, path, and pace of learning, alongside in-person supervision at a physical location away from home. In the 21st century, it has gained recognition as a promising instructional

method, offering numerous advantages for both students and instructors. These advantages include enhanced flexibility, accessibility, interactivity, engagement, personalization, and feedback, as highlighted by [2]. Furthermore, blended learning plays a crucial role in fostering essential skills and competencies for thriving in the digital age, such as critical thinking, problem-solving, collaboration, communication, creativity, and digital literacy, as emphasized by the OECD [3].

Blended learning has emerged as a powerful and wide range of technologies that combine traditional in-person instruction with online resources and activities. A growing body of literature recognizes the importance and potential of Blended Learning to enhance pre-service teachers' self-efficacy in education programs in several ways [4]. Teachers who support online learning and acknowledge its benefits in education believe that students can engage in virtual discussions and conversations with their instructors, eliminating the need for physical attendance in traditional classrooms [5]. According to [6], the increasing availability of the Internet provides students with opportunities for continuous learning and skill development. Furthermore, it enables educators to reach a broader student population, enhancing access to information and interactive communication [4].

Considering the COVID-19 pandemic, Blended Learning (BL) is becoming the new normal in higher education institutions (HEIs). As a result, teacher education programs in HEIs have drawn much attention to online and blended learning models, as educators all over the world are now forced to rethink how to implement their curriculum, instructions, and assessment in an online, blended, and hybrid environment [7]. This is because BL can be used to improve theoretical knowledge comprehension and guarantee that pre-service teachers have enough teaching practice and observation experience while minimizing the pressure on teacher education institutions and mentoring teachers. Therefore, it becomes vital that teacher educators and pre-service teachers use BL, given the continually changing nature of education and increased demand for technology in teaching and the teaching profession. Similarly, if pre-service teachers are to include BL in their future teaching in the development of 21st-century learners, pre-service teachers' self-efficacy toward technology usage must be enhanced through the teacher education program [7][8].

According to [8], self-efficacy refers to the belief in one's ability to execute and coordinate actions to achieve goals. The authors further argued that self-efficacy beliefs impact motivation, behavior, thoughts, and emotions. Several researchers also indicate that teaching self-efficacy, or teachers' beliefs about their professionalism, is a significant predictor of instructional strategies and student achievement [8-11]. Therefore, [12] identifies four sources of self-efficacy: mastery experiences (successful completion of a similar activity, especially if it required perseverance), vicarious experiences (observing peers successfully complete an activity), verbal persuasion (receiving confirmation from others that one can succeed), and emotional state (the interpretation and response to feelings of stress, for example). According to [12], mastery experiences are the most crucial element of self-efficacy. They offer evidence

that one possesses the necessary abilities to succeed since one has previously achieved it. Mastery experiences are crucial in the context of blended learning because it allow students to progress through the material at their own pace and ensure they have a deep understanding of the content before moving on to the next topic or concept. This personalized approach to learning allows students to focus on areas where they may be struggling and gives them the opportunity to master the material before moving forward. Therefore, if a student has previously experienced and achieved success with blended learning, they will be convinced that success is attainable once again and hence be prepared to persevere. This form of self-awareness, based on previous encounters, shapes the perception of one's effectiveness.

However, it is important to note that the effectiveness of blended learning in enhancing pre-service teacher self-efficacy may vary based on the specific design of the program, the quality of online resources, and the support provided by instructors [13]. The debate continues that a hands-on approach enhances their self-efficacy as they gain confidence in their ability to apply what they have learned. Blended learning on social persuasion fosters a supportive learning community where pre-service teachers can interact with peers and receive instructor feedback. This social support system positively influences their self-efficacy. Thus, when implemented effectively, blended learning can empower pre-service teachers and contribute to their self-efficacy in preparation for their future careers in education. Nevertheless, the main challenge many researchers face is the pedagogical training of the Pre-service teachers. Of particular concern is a need for training in content knowledge and effective online teaching methods and strategies to develop self-efficacy in blended learning settings. Thus, given the growing role of digital technology in teaching and learning in educational policies and curricula, the study examined how blended learning can be used to enhance the self-efficacy beliefs of preservice teachers in teacher education.

2   Research Question

How can blended learning be used to enhance pre-service teachers' self-efficacy beliefs in a rural teacher education program?

3   Methodology

This paper examined how blended learning can be used to enhance pre-service teachers' self-efficacy beliefs in teacher education programs. It also discussed the relationship between online technologies, self-efficacy, and pre-service teachers' satisfaction. This article utilized a literature review methodology that involved conducting document analysis and conceptual analysis of secondary sourced data. The data sources encompass a variety of scholarly journals that have undergone peer review, along with reports, policies, and newspaper articles. The search was performed using electronic databases and search engines, including Google Scholar, ERIC, SCOPUS, and ResearchGate. These platforms are widely recognized for their access to a diverse

range of notable publications across several fields of study. Specifically, in relation to utilizing blended learning as a mechanism for improving pre-service teachers' self-efficacy beliefs in teacher education programs, these databases offer valuable insights for the literature analysis outlined in this article.

For this study, a comprehensive coverage strategy was utilized, encompassing all pertinent studies, both published and unpublished, in order to establish conclusions based on an extensive knowledge base. The authors ran a Google search using specific terms such as "Blended Learning," "Self-efficacy," "Teacher education program," and "BL in Teacher education program" to find existing material. The screening procedure specifically targeted English scholarly articles published between 2008 and 2024, which contained at least one mention of teacher education. At first, over 200 articles were acquired, but after applying the review criteria and eliminating any duplicates, the number was reduced to 28 articles. After evaluating the quality of the primary research, 16 scholarly publications that were in line with the review's aims were chosen. Subsequently, information was obtained from each study, specifically emphasizing its pertinence to the research issue. Ultimately, the extracted evidence underwent analysis through the process of collating, summarizing, aggregating, organizing, and comparing the data. The findings were presented using themes that were in line with the research topics.

4   Results and Discussion

4.1   Online technologies, self-efficacy, and student satisfaction

According to [14], student satisfaction can be defined as an individual's subjective judgment of how much a learning environment facilitates their academic achievements. According to [15], a correlation exists between student satisfaction with online learning and many factors, such as motivation, dropout rates, success, and dedication to a learning program. Therefore, it is imperative to assess student satisfaction to identify areas that require development and enhancement in online or blended learning. The study conducted by [16] investigated the variables that are associated with learners' satisfaction and identified online self-efficacy as a significant predictor of learner satisfaction. In their study on the determinants of self-regulation in e-learning, [17] identified several factors that influence perceived satisfaction. These factors include perceived self-efficacy, an interactive learning environment, and perceived anxiety. Additionally, the study found that perceived satisfaction and perceived self-efficacy have a positive influence on the perceived usefulness of the course. In their study, [18] examined the correlation between online self-efficacy and student happiness. To do this, the researchers deconstructed online self-efficacy into multiple constituent variables. The findings indicate that each component of online self-efficacy has a favorable influence on student satisfaction.

The self-efficacy of learners significantly impacts various aspects of their learning process, including their approach to learning, attitude toward learning, ability to acquire new abilities, selection of learning activities, and persistence in pursuing a particular course of action [17]. According to social cognitive theory, there are two important cognitive factors, namely performance expectation and self-efficacy, that have an impact on student behavior. These factors have the ability to improve achievement and play a role in determining the level of effort students will exert in a given activity [19]. The concept of self-efficacy should be specifically applied to the academic domain, focusing on students' confidence in their capacity to do successfully. Individuals with elevated levels of self-efficacy demonstrate a greater propensity for engagement, exertion, and dedication in their academic pursuits. These students are highly committed to fulfilling their responsibilities and actively strive to attain ambitious objectives, cultivating a diligent and industrious disposition. According to [20], self-efficacy can influence motivation levels and enhance academic performance. In addition to the imperative of cultivating aptitudes and acquiring the necessary proficiencies to execute academic assignments, pupils must also foster a robust conviction in their capacity to accomplish these duties successfully. According to a study conducted by [21], it can be observed that the motivating aspect of perceived self-efficacy is associated with a favorable outcome in terms of academic achievement.

Regarding online teaching and learning, [15] posit that online learning exhibits a greater emphasis on student-centeredness, requiring students to take on increased responsibilities and autonomy, particularly in asynchronous learning contexts. The necessity for students to cultivate self-regulatory abilities in response to the demanding and adaptable nature of online learning has been highlighted by [22], with self-efficacy playing a crucial role in this process [7]. Online learning is characterized by a significant degree of interaction, necessitating students to engage actively and govern their own participation, independently access the course materials, and devise a personalized approach to their learning endeavors [23]. The above assertion resonates with the findings of the research conducted by [24], which revealed that individuals who possessed a high level of online self-efficacy exhibited greater levels of satisfaction with an online learning environment that facilitated their use of the Internet, exploration of diverse material resources, and expansion of their knowledge.

According to the study conducted by [25], individuals who possess a higher degree of computer self-efficacy tend to place greater importance on online learning. Furthermore, as the learning tasks and challenges transition to a computer-based and mediated environment, these individuals experience a rise in their perceived level of self-efficacy. Furthermore, it has been observed that individuals tend to participate in increased study efforts through the utilization of online resources, hence enhancing their level of involvement in the educational process [26]. The motivation of students to learn and engage is influenced by their self-efficacy, and in the case of technology-related tasks, the utilization of technology serves as a source of motivation. As such, [25] summit that the development of self-efficacy during the learning process can be facilitated by feedback, that is, positive feedback derived from the experience of uti-

lizing technology, as well as positive feedback resulting from the perceived improvement in learning capacity [25].

4.2   Blended learning in enhancing pre-service teachers' self-efficacy.

Highlighting constructive suggestions from previous scholars [25][27-29], who indicated that a combination of traditional face-to-face instruction and online learning has gained significant attention in the field of education. As such, Chiu [29] suggested that in Blended learning, there is a fusion of offline and online learning. Remarkably, Bandura's teacher self-efficacy model (TSE) and the technological pedagogical content knowledge (TPACK) model to understand how pre-service teachers' self-efficacy is enhanced using blended learning [29]. Wiens et al. [30] suggest that in an online context, educators must cope with their own and students' fatigue because of long hours spent in front of a computer screen while implementing effective teaching pedagogies that promote active learning [30]. Further [29] indicates that adequate planning to integrate technology can boost teachers' self-efficacy and confidence, which will contribute to them experiencing classroom success and being more willing to use blended learning and TPACK without feeling pressured.

Furthermore, at the intersection between content and attitude, [31] found that focusing on 21st-century skills development, as opposed to technical training, leads to increased teacher self-efficacy and valuing of technology's role in their teaching. How teachers learn directly impacts the effectiveness of their subsequent use of classroom methods. Furthermore, [31] emphasizes the impact of learning by doing, i.e., making courses interactive, authentic, and contextually responsive to local circumstances. Self-efficacy is a strong predictor of behavior, suggesting that teachers who experience alternative, successful pedagogical approaches are more likely to integrate them into their own practice [7]. As such, technology-supported instruction ought to implicate this variable as an important factor in achieving systemic outcomes. Pre-service teachers are usually enrolled in a university-level teacher education program as student teachers. Typically, student teaching leads to an undergraduate or graduate degree, a teaching certificate, and potential entry into the profession. Oikawa et al. [32] argued that while students had positive attitudes toward BL, their academic achievement was not significantly affected. Furthermore, [32] note that since students enrolled in BL classrooms could listen to a significant portion of the online course content, more time was gained for creating a face-to-face learning environment in which active participation increased. Similarly, [33] suggest that when pre-service teachers feel a task is meaningless or useless, academic boredom may arise, resulting in student outcomes challenged; encouraging students to have control over their studies using BL has the potential to assist the pre-service teachers in dealing with the potentially detrimental impact of boredom. Thus, in the specific context of teacher education, this emphasizes how crucial it is to understand and to help pre-service teachers cope with boredom in their studies. Therefore, [33] suggests that it is crucial to consider the boredom in pre-service teachers' self-efficacy on the use of blended learn-

ing, and educators should endeavor to eliminate using appropriate instructional strategies.

5   Conclusion

Many studies have explored how blended learning has been implemented by pre-service teachers in education programs. However, the conclusions are inconsistent, and there is relatively less research on using blended learning as a tool to enhance pre-service teachers' self-efficacy. As such, this article examined how blended learning can be used to enhance the self-efficacy beliefs of pre-service teachers in teacher education programs and the relationship between online technologies, self-efficacy, and pre-service teachers' satisfaction. The study concludes that by leveraging the benefits of blended learning, pre-service teachers can develop strong self-efficacy, leading to improved confidence and competence in their future teaching endeavors. This study recommends further research to determine practices and implications of blended learning on self-efficacy enhancement to extend the body of knowledge.

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