The Effectiveness of Blended Learning in Teacher Education Programs

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Abstract

This study intends to evaluate the effectiveness of blended learning in a teacher education program and any impacts it might have on the academic performance and self-efficacy of pre-service teachers. Eighty pre-service teachers (40 males and 40 females) aged 20-30 years old were selected through convenience sampling from a senior teacher education program, and the research employed a mixed methods approach using a quantitative pretest-posttest design, and rich, qualitative data drawn from reflective journals and focus group discussions. The data collection instruments consisted of a blended learning efficacy survey and self-reports of academic performance. Quantitative data were analyzed and reported in terms of repeated measures ANOVA analysis, which found significant changes in both participants' academic performance and self-efficacy report after workers participated in a blended learning implementation. Qualitative data were analyzed thematically, from which findings revealed the perceived benefits of blended learning from participants including flexibility, increased access to resources available for learning, social opportunities for collaboration, and the perceived challenges for teachers in time management and navigating digital platforms. Based on these findings, it was concluded that a blended learning intervention can be a potentially viable option to develop pre-service teachers, both in academic and digital literacy terms. The study recommends including blended learning options within teacher education curricula, while also recognizing the need for incorporated support from faculty, and learner development and reflectivity.

Introduction

Blended learning or hybrid learning is an instructional model that combines online digital learning resources with traditional classroom instruction. This combination of single mode and dual-mode delivery is increasingly valuable and relevant within higher education, specifically teacher education, given the potential for flexible and autonomous learning opportunities combining learning with interactive social and deep engagement. According to Hrastinski (2019), blended learning entails synchronous and asynchronous modalities of learning, thereby providing learners with the opportunity to reach, learn and grow at their own pace in addition to receiving real-time instruction and experiences with peers.

In teacher education setting, and even more so in language teacher education, the importance of blended learning is evident. Pre-service teachers must not only understand pedagogical theory but develop pedagogical practices (such as digitally-oriented practices) as well. Blended learning provides a platform for critical pedagogy and practice to take place at the same time. It enables a hybrid approach to the integration of both theoretical modules provided online and practical, collaborative, and reflective practices in person. As Graham et al. (2020),

note, blended learning promotes instructional innovation and serves as professional preparedness; it supports future teachers to be able to teach in technology-rich classrooms.

The significance of blended learning was enhanced throughout the COVID-19 pandemic, when educational institutions around the world were urged to adopt online or hybrid teaching models. While initially conceived a response to emergency remote teaching, this pedagogical model evolved to become a sustainable pedagogical strategy that is connected to the long-term changes of education systems. According to Crawford et al. (2020), the pandemic exposed both the vulnerabilities and the potentials of digital education, encouraging institutions to reconsider their traditional models of delivery.

Language education, specifically, stands to take advantage of blended learning because it emphasizes interaction, multimodal input, and continuous feedback. Communicative Language Teaching (CLT), which supports many modern language curricula, values learner autonomy, authentic communication, and real-time interaction, all possibilities found in blended environments. According to Nortvig, Petersen, and Balle (2018), blended learning improves language acquisition via multimedia input, online interaction, and scaffolded collaborative activities, and by so doing, makes it highly relevant for preparing future language teachers.

Despite its benefits, blended learning is not consistently incorporated into teacher education and teacher training programs. Many institutions encounter challenges when trying to incorporate Blended Learning pedagogically that aligns with program objectives, adequately training faculty, and creating continued engagement across the full range of platforms (Rapanta et al., 2020). Additionally, there is a lack of evidence measuring the impact of blended learning in relation to specific tangible measures including academic performance, pedagogical confidence and self-efficacy. This is especially true in the specific context of language teacher education.

This study addresses this gap by investigating the impact of blended learning in a teacher education program concentrated on English language instruction. It probed the effect of blended learning on pre-service teachers' academic gaining and self-efficacy, and looked at the perceived advantages and challenges of blended learning. By doing so, the present study helps to provide evidence to inform the curriculum development, instructional practice, and educational policy of institutions in teacher education programs to integrate blended learning in their training.

Statement of the Problem

Traditional face-to-face instruction has been the domineering model in teacher education programs for a long time, suggesting structured settings for pre-service teachers to enhance basic educational skills. Nevertheless, rapid improvements in digital technology and the growing demands for flexible learning contexts have provoked a shift toward other educational approaches among which, blended learning has turned out to be one of the best models that tries to integrate the best of both online and face-to-face instruction.

Although blended learning is rapidly gaining attraction in teacher education programs, especially in higher education, the systemic variation of the model has yet to be thoroughly

evaluated across programs. While studies have acknowledged certain advantages of blended learning in teacher education, such as increased accessibility for learners, development of learner autonomy, and collaborative learning opportunities (Graham et al., 2019; Hrastinski, 2019), there are still other challenges associated with blended learning educational model framework. Successful blended learning depends on a variety of factors - sufficient technological infrastructure, time and training for faculty, and high-quality digital course content (Rapanta, et al. 2020). Moreover, many preservice teacher education programs also have no reliable program framework to evaluate the effectiveness of blended learning format on essential outcomes such as achievement, teaching confidence, and digital competence.

Language teacher educator programs in particular, have been and will continue to be challenged with the educational demands of using a communicative method of instruction and emergent technological demands of blended learning. Although there is a natural fit between blended learning and the multimodal requirements of language learning, many programs try to make an alignment between digital tools and instructional goals (Horn & Staker, 2019). Consequently, online elements are often used casually, replicating traditional lecture formats rather than leveraging the sole benefits of blended contexts.

Previous literature also indicates a missing piece in understanding how blended learning impacts pre-service teachers' academic performance and self-efficacy, particularly in an environment where the goal is to prepare language educators. Empirical studies examining how blended learning approaches impact outcomes in teacher training program in a systematic manner are very few. Furthermore, research has not yet examined the learner experiences that mediate the relationship between blended learning and critical outcomes.

This study tries to pinpoint these gaps by assessing the impact of blended learning in the context of a teacher education program, concentrating on language teaching. This study particularly explores not only the way blended learning affected pre-service teachers' academic performance and self-efficacy, but also the conditions which were likely assumed to make blended learning effective. By addressing the under-explored connection between blended learning and language teacher education, the findings of the study can provide sound examples and insights to improve instructional design, faculty development, and learner support for language teacher education programs around the world over the coming decades.

Significance of the Study

This study is important in contributing to how both the theoretical understanding and practical implementation of blended learning theory is set in the world of teacher education. As we embed more and more digital tools into classroom instruction as foundations for teachers' practice, it is essential for teacher education programs to prepare educators not only to teach well, but to manage technology in academic spaces in meaningful ways. Blended learning appears to hold a promising pathway in achieving both practice and theory in order for pre-service teachers to examine and reflect on their instruction in physical and digital realms.

The present study addresses a pressing need for empirical research that assesses the actual effect of blended learning on specific learner outcomes, particularly, academic performance and teaching self-efficacy. By probing these results among pre-service teachers, it extends beyond advocating for blended learning, and provides sound evidence to support or refute the legitimacy of blended learning in teacher preparation.

Perhaps most importantly, this study has concentrated on pre-service teachers who are preparing to enter language teaching settings. Good language instruction needs both content knowledge of language and pedagogical skills, and fluency with digital resources to promote communicative student-centered learning. In this way, the study adds to the continuous growth of TEFL pedagogy by understanding how blended learning experiences within pre-service teachers can potentially support the development of reflective, digitally literate, pedagogically flexible language educators.

Moreover, the study identifies real barriers that institutions will have to pinpoint when implementing blended learning, specifically technological infrastructure, training for faculty, and support system for students. By identifying both the advantages and barriers of blended learning incorporation, the study creates a balanced and realistic perspective that can influence decisions made concerning curriculum design, instructional design, and educational policy around teacher education.

In summary, this study is important not only for scholars and teachers, but also for administrative program leaders and policymakers hoping to modernize teacher education programs for the Twenty-first Century learning context. The study represents an important step towards aligning educational innovations with today's educational realities, particularly within the dynamic field of language teaching.

Research Questions

This study is guided by the following research questions:

1. How does blended learning impact the academic performance of pre-service language teachers compared to traditional learning methods?
2. What is the effect of blended learning on the teaching self-efficacy of pre-service language teachers?
3. What instructional, technological, or contextual factors influence the perceived effectiveness of blended learning in language teacher education programs?

Literature Review

Blended learning is supported by several overarching key educational theories that guide its implementation and inform its impact in teacher education contexts. One basic model is the Community of Inquiry (CoI) framework created by Garrison, Anderson, and Archer (2000), which considers meaningful learning the consequence of interaction between teaching presence, cognitive presence, and social presence. The CoI framework is specifically pertinent for blended environments, where ongoing engagement across online and face-to-face modalities relies on

effective instructional design, tasks for critical thinking, and appropriate collaborative discourse (Garrison & Vaughan, 2018).

Equally effective is constructivist theory, which sets learners as active participants in creating knowledge via interaction with content, tools, and other learners. Blended learning is naturally in line with constructivism through enabling learner-centered, interactive, and self-directed learning contexts (Hrastinski, 2019). When blended learning is applied to teacher education, constructivist-informed blended learning models encourage pre-service teachers to ponder over their teaching practices, cooperate with other learners, and adapt instruction on the basis of experience.

In the meantime, the Technological Pedagogical Content Knowledge (TPACK) framework suggests a pragmatic lens to see the way instructors incorporate digital tools into their teaching. TPACK considers the combination of content expertise, pedagogical strategies, and technological fluency—an essential combination in preparing pre-service instructors to take advantage of blended learning in an effective manner. Research indicates that being exposed to blended learning context enables future teachers to develop these competencies in contextually relevant ways (Vaughan et al., 2019), therefore supporting their transition into digitally integrated classrooms.

These theoretical models explain both the structure of blended learning context and give information concerning the instructional strategies used in them—especially in programs that prepare teachers for the complexities of language teaching.

Over the last ten years, the use of blended learning in teacher education has steadily increased, supported by its capacity to fill the gap between theory and practice. Research indicate that blended learning encourages reflective practice, self-regulation, and collaborative learning, which are all essential for professional development of pre-service teachers (Vaughan, Cleveland-Innes, & Garrison, 2019). When effectively and properly designed, blended learning enables teacher trainees the opportunity to engage in asynchronous content exploration while using in-person sessions for application and peer discussion.

Flexibility is usually deemed as the main advantage of blended learning, especially for learners who juggle coursework with practicum placements or part-time jobs (Nortvig et al., 2018). Additionally, it has been discussed that blended learning can enhance learners' autonomy and technological fluency—that are increasingly valued competencies in educational fields adapting to 21st-century learning needs.

Nonetheless, the academic literature has noted that many challenges are recurring for blended learning. Using blended learning will not be achieved by just merging online and offline activities; rather, it requires sound integration of instructional design, faculty preparedness, and instructional alignment with program outcomes. With this alignment missing, pre-service teachers may experience learning that is disconnected, or feeling at a loss for either component of their learning—i.e., digital or face-to-face instruction (Rapanta et al., 2020). Though the literature in the field is expanding, additional studies are needed to focus more specifically on

how blended learning fosters teachers preparation and supports their professional growth in content-rich and communication-focused areas such as language education.

Language education is especially well-suited for blended teaching, since it requires the integration of the interactive practice of language learning through multimodal input and feedback-rich settings. Research demonstrates that blended learning helps communicative language learning through integrating tools such as discussion forums, synchronous and asynchronous classrooms, interactive videos, and language apps which allow real-time or reflective communication (Picciano, Dziuban, & Graham, 2020). These platforms give students the ability to practice and use their language knowledge in the four modes of language skills, namely, listening, speaking, reading, and writing.

In teacher training programs, pre-service language teachers greatly take advantage of blended learning in different ways. First of all, they learn the proper way to use digital tools for communicative purposes. Second, they learn about a range of instructional formats which they can use in their own classrooms at a later time. For example, being exposed to asynchronous video responses or peer-reviewed online discourse can be an example or model for them to later implement and leverage the technology available. Research has also demonstrated that blended learning promotes digital literacy in teacher students as they curate digital content and non-face-to-face learning outcomes, providing opportunities for distant interaction, and assessing student learning using different online platforms (Horn & Staker, 2019).

Though advantageous and beneficial, some studies give caution about too much dependence on technology to learn language, especially in conditions where immediate feedback or interaction is not available (asynchronous modes) (Boelens et al., 2018). Thus, it is extremely necessary to incorporate online and face-to-face activities to make sure about pedagogical effectiveness and learner engagement.

It should be mentioned that blended learning has its own limitations, as well. One which is often cited is the digital divide, where not all learners have equal access to devices or stable internet which can on its own exacerbate existing educational inequities (Nortvig et al., 2018). In teacher education, this can delay participation in online components and restrict the progress of digital competencies. In the meantime, blended learning needs extensive training for teachers and educators to design organized courses that are in line with digital and personalized instruction. Teachers and instructors who are not clear on online pedagogy may recourse to changing traditional lectures into a digital format instead of making full use of a blended setting (Hrastinski, 2019).

Curriculum design is complex as well. Much of the past literature highlights the importance of educational coherence — where tasks designed for online and face-to-face contexts are complimentary elements of a unified learning progression and intentionally sequenced to support students' learning. In the context of language teacher education, this can mean that meaningful digital resources mediate language production and comprehension through the communicative purpose of the tasks — which by itself demands purposeful planning and pedagogical fluency.

Other potential problems include time engagement of learners, feelings of isolation in asynchronous settings and inconsistent online participation, all of which highlight the significant role that clear expectations, timely feedback and institutional supports play in blended learning environments (Rapanta et al., 2020).

The research studies in blended learning highlight several promising directions one of which is the integration of adaptive technologies and artificial intelligence. Adaptive technology has the potential to tailor the learning experiences of each student by differentiating pathways along their preferences or data from previous performances. Such tools may improve the accountability of blended settings, especially in language learning where personal pacing and scaffolding are imperative (Means et al., 2020).

Another area of interest concerns context-sensitive studies. Much of the past literature concentrates on contexts with advanced technology; therefore, we need to have more research in less technologically-advanced or disproportionate technological settings, so we gain a better understanding of what blended models sound like in teacher education in varying teacher education systems. (Boelens et al., 2018).

Lastly, researchers have called for more longitudinal studies assessing blended learning's lasting effect on teaching practices and learner outcomes. This is not only important in teacher education, but also revolutionary in terms of truly investigating whether and how blended training impacts novice teachers' use of technology, instructional confidence, and the ability to manage complex classrooms over a longer time span (Vaughan et al., 2019).

In conclusion, although blended learning has great potential to enhance teacher education—particularly in language-focused programs—important questions remain concerning its efficacy, implementation, and sustainability. Past literature provides sound theoretical bases and identifies great advantages, but also pinpoints problems and difficulties in aligning pedagogical goals with technological affordances. So far, very few studies have specifically explored how blended learning impacts the academic performance of pre-service teachers and their self-efficacy in the language teacher training environments; this study fills that gap by applying solid theoretical perspectives to a reflective evaluation of a blended course, thus contributing to the research literature on blended learning and the knowledge base on evidence-based practices in TEFL teacher education.

Methodology

Participants and Sampling

The sample consisted of 80 pre-service teachers (40 males and 40 females), with an age range of 20 to 30, who enrolled in a teacher education program at Safir Language Academy. Participants specialized in language education, and all had prior exposure to digital learning tools. Convenience sampling was used due to accessibility, which limits generalizability but is suitable for exploratory research involving educational interventions.

While no power analysis was conducted, the sample size aligns with prior studies using repeated measures designs in education research (Field, 2018). Prior experience with digital tools was included as a control criterion to minimize variability due to technological unfamiliarity.

Study Design

This study used a mixed-methods research design to explore the effect of blended learning on pre-service language teachers' academic performance and self-efficacy. The design followed a convergent parallel approach (Creswell & Creswell, 2018), in which quantitative and qualitative data were collected simultaneously and analyzed independently before being triangulated to generate a comprehensive understanding of the intervention's effects. In fact, the study integrated quantitative pretest-posttest measures with qualitative data from reflective journals and focus group discussions. The quantitative component assessed changes in academic performance and teaching self-efficacy. The qualitative strand explored participants' experiences and perceptions of the blended learning process, thereby complementing and enriching the statistical findings.

Instruments

The study employed multiple data sources to ensure a comprehensive evaluation of the intervention. The Blended Learning Efficacy Survey, adapted from Nortvig et al. (2018), was a 20-item instrument designed to assess participants' self-efficacy (e.g., confidence in using digital tools), satisfaction, and perceived learning outcomes. Responses were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), and a pilot test of the survey demonstrated strong internal consistency, with a Cronbach's alpha of 0.88. Academic performance records were obtained from institutional sources, including students' assignment scores and overall course grades, both before and after the intervention. In addition, reflective journals were collected weekly, with participants responding to guided prompts such as "What challenges did you face this week?" and "How did online tools support your learning?"—serving as the main source of qualitative data. Finally, focus group interviews were held with 24 randomly selected participants, divided into four groups of six. Each session, lasting between 45 to 60 minutes, followed a semi-structured protocol that explored themes such as student engagement, collaboration, and the use of digital resources.

Procedure

The study was conducted over a 15-week academic semester and was implemented in three phases. During the Pre-Intervention Phase, participants completed a pretest survey and submitted baseline academic records, while informed consent was obtained and the study's purpose was clearly explained. In the Intervention Phase, participants engaged in a blended learning course that included asynchronous modules (video lectures, discussion forums, and quizzes), synchronous online sessions (Zoom-based lectures and collaborative tasks), and face-to-face classes (project-based learning and micro-teaching sessions), with the instructional format split approximately 50% online and 50% in person. In the Post-Intervention Phase, participants completed a posttest survey, and final academic records were collected. Additionally, students submitted their reflective journals, and focus group interviews were conducted. To ensure

instructional consistency throughout the study, the same instructor delivered all course components using a standardized syllabus and evaluation rubric.

Data Analysis

Quantitative Analysis

Pretest and posttest data were analyzed using repeated measures ANOVA to determine statistically significant changes in academic performance and self-efficacy. Assumptions of normality and sphericity were tested and satisfied. Effect sizes (η^2) were calculated to assess the magnitude of changes.

Qualitative Analysis

Journal entries and focus group transcripts were analyzed using thematic analysis (Braun & Clarke, 2019). An inductive coding approach was employed to allow themes to emerge from the data. Two independent coders conducted the analysis, achieving an inter-rater reliability score of 0.82 (Cohen's Kappa). Themes were validated through peer debriefing and member checking with selected participants.

Data Integration

Findings from both data strands were triangulated during interpretation. Quantitative trends were cross-referenced with qualitative insights to identify convergence (e.g., self-efficacy gains supported by journal reflections) and divergence (e.g., statistical gains not perceived as meaningful by some participants). This allowed for a more nuanced understanding of the impact of blended learning on teacher development.

Results

This section presents the study's findings in two parts: quantitative results from pretest and posttest measures, and qualitative insights from reflective journals and focus group discussions.

## Quantitative Results

Academic Performance

A repeated measures ANOVA was conducted to examine changes in academic performance following the blended learning intervention. As shown in Table 1, the mean academic performance score increased from M = 72.5, SD = 10.3 at pretest to M = 80.2, SD = 9.8 at posttest.

The analysis revealed a significant improvement in academic performance, $F(1, 79) = 10.85$, $p < .01$, with a moderate effect size ($\eta^2 = .12$), indicating that the intervention accounted for 12% of the variance in scores (See Table 1 below).

Table 1

Academic Performance Before and After Blended Learning Intervention

Measure	Pretest Mean (SD)	Posttest Mean (SD)	F-value	p-value	η^2
Academic Performance	72.5 (10.3)	80.2 (9.8)	10.85	< .01	.12

Figure 1 below also highlights the significant improvement in academic scores after the blended learning intervention.
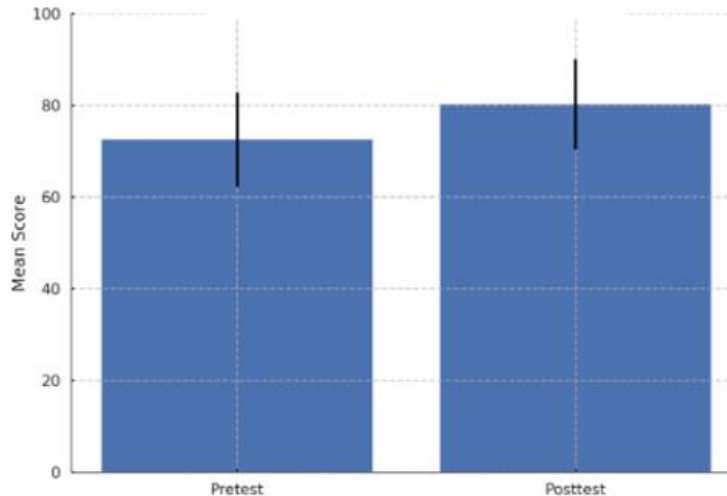
Figure 1. Academic performance: Pretest vs. posttest

These results suggest that blended learning had a statistically meaningful impact on improving pre-service teachers' academic outcomes.
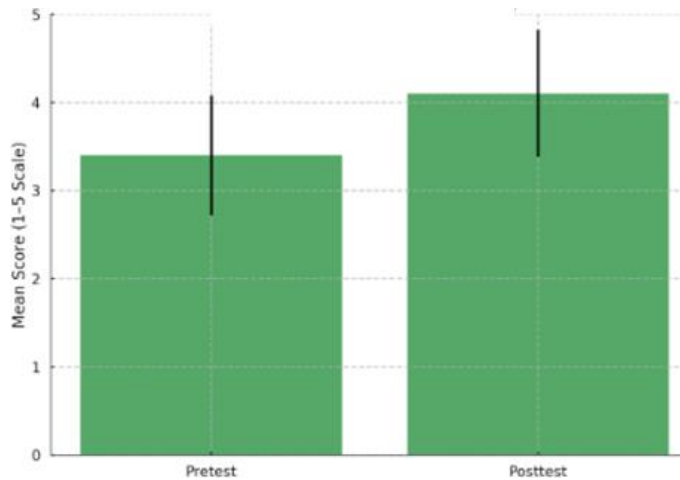
Self-Efficacy

Self-efficacy scores also showed significant gains following the intervention. The average score increased from M = 3.4, SD = 0.68 at pretest to M = 4.1, SD = 0.72 at posttest.

The repeated measures ANOVA yielded $F(1, 79) = 9.34$, $p < .01$, with an effect size of $\eta^2 =$ .11, suggesting a moderate impact of the intervention on self-efficacy development.

Table 2

Self-Efficacy Scores Before and After Blended Learning Intervention

Measure	Pretest Mean (SD)	Posttest Mean (SD)	F-value	p-value	η^2
Self-Efficacy	3.4 (0.68)	4.1 (0.72)	9.34	< .01	.11

Too, Figure 2 below visually shows increased confidence levels in participants following the intervention.

Figure 2. Self-efficacy: Pretest vs. posttest

This increase indicates that the blended learning model contributed to participants' growing confidence in teaching and using digital tools.

Qualitative Results

Thematic analysis of reflective journals and focus group discussions identified three dominant themes: Flexibility, Access to Resources, and Collaboration. Table 3 presents the prevalence of each theme across participants.
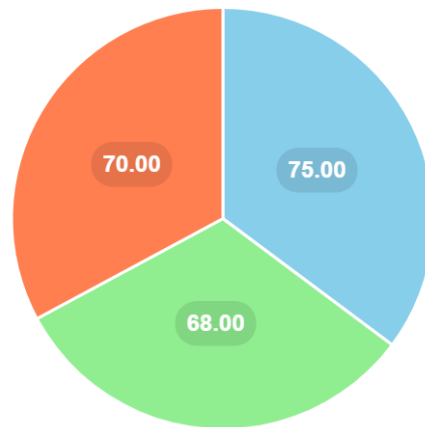
Table 3
Key Themes and Frequency in Qualitative Data

Theme	Frequency (%)
Flexibility	75%
Access to Resources	68%
Collaboration	70%

As it can be seen, Figure 3 summarizes the distribution of participant-reported themes: Flexibility, Access to Resources, and Collaboration.

Figure 3. Frequency of qualitative themes

Flexibility

Many participants reported that the blended format enabled them to balance academic work with personal and professional responsibilities. One participant stated:

"The ability to access materials online at my own pace was especially helpful during busy weeks."

This flexibility allowed learners to engage with content at convenient times, supporting self-directed learning and content review.

Access to Resources

Participants appreciated the integration of multimedia tools such as video lectures, quizzes, and online forums. As one journal entry noted:

"Having access to diverse resources made complex topics easier to understand."

The diversity of resources was viewed as a major contributor to content comprehension and engagement.

Collaboration

Both face-to-face sessions and online platforms (e.g., discussion boards, breakout rooms) were cited as valuable for peer learning. A focus group participant remarked:

"Collaborating with peers in both virtual and physical spaces helped me learn from different perspectives."

Participants described the hybrid interaction model as instrumental in developing pedagogical strategies through shared experiences.

Integration of Findings

The quantitative and qualitative findings aligned closely. Statistical improvements in self-efficacy and academic performance were mirrored in participants' perceptions of increased confidence, autonomy, and engagement. Themes such as flexibility and collaboration helped explain why the blended model may have been effective. No major discrepancies were found between the two data strands, suggesting convergence in evidence across methods.

Overall Implications

- The findings from all three tables demonstrate that blended learning positively impacts both objective (academic performance) and subjective (self-efficacy) measures of learning.
- The qualitative data further elucidates the mechanisms driving these outcomes, emphasizing flexibility, resource accessibility, and collaboration as critical factors.

Answering the Three Research Questions

1. How does blended learning impact the academic performance of pre-service language teachers compared to traditional learning methods? The results demonstrate that blended learning significantly improves the academic performance of pre-service teachers compared to traditional methods. As shown in Table 1, the average academic performance scores increased from 72.5 (SD = 10.3) in the pretest to 80.2 (SD = 9.8) in the posttest following the blended learning intervention. The repeated measures ANOVA yielded a significant result (F = 10.85, p < .01), confirming that the improvement was not due to chance.

Qualitative data supported these findings, with participants reporting that the integration of online resources and in-person discussions allowed for a better understanding and retention of content. The flexibility of accessing materials online and engaging in collaborative face-to-face sessions contributed to their deeper engagement with the material. These results highlight that the combination of synchronous and asynchronous learning in blended environments is more effective than traditional classroom-only methods for enhancing learning outcomes.

2. What is the effect of blended learning on the teaching self-efficacy of pre-service language teachers? Blended learning had a significant positive impact on the self-efficacy of pre-service teachers. Table 2 illustrates an increase in self-efficacy scores from 3.4 (SD = 0.68) in the pretest to 4.1 (SD = 0.72) in the posttest. The improvement was statistically significant (F = 9.34, p < .01). This indicates that participants felt more confident in their ability to perform teaching tasks and navigate technological tools after engaging in the blended learning program.

Participants' reflective journals and focus group discussions revealed that the opportunity to practice with digital tools and receive regular feedback contributed to their enhanced self-efficacy. For example, one participant noted that using online platforms to design lesson plans

and interactive activities boosted their confidence in integrating technology into their future classrooms. These findings suggest that blended learning fosters self-efficacy by providing both mastery experiences and exposure to modern pedagogical tools.

3. What factors contribute to the perceived effectiveness of blended learning in language teacher education programs? Several factors emerged as contributors to the perceived effectiveness of blended learning:

1. **Flexibility:** Participants appreciated the ability to access materials and complete tasks at their own pace. This flexibility allowed them to balance their coursework with other commitments, as reflected in the qualitative data where 75% of participants emphasized flexibility as a key advantage.
2. **Access to Resources:** The integration of diverse multimedia tools, such as videos, quizzes, and discussion boards, enriched the learning experience. Approximately 68% of participants highlighted the availability of these resources as instrumental in improving their understanding of complex topics.
3. **Collaboration:** The combination of online discussions and face-to-face group projects facilitated meaningful interactions among peers. About 70% of participants reported that collaborative activities helped them gain new perspectives and improved their problem-solving skills.
4. **Improved Digital Literacy:** The blended model provided pre-service teachers with hands-on experience in using technology for educational purposes. This practical exposure not only prepared them for future technology-rich classrooms but also increased their confidence in adopting innovative teaching strategies.

These factors collectively explain why blended learning is perceived as an effective approach in teacher education programs. The results align with previous studies, highlighting the importance of balancing online and in-person interactions to maximize learning outcomes.

Discussion

The purpose of this study was to examine the effectiveness of blended learning in a teacher education setting, exploring whether it impacted academic performance and teaching self-efficacy of pre-service language teachers. The results provide strong support that a carefully designed blended learning model can create the conditions for better learning and facilitate reflection and digital literacy in educators. The following discussion interprets the results and findings against the research questions and literature in, and relevant to, the field.

Blended Learning and Academic Performance

The improvement in academic performance after the blended learning intervention is consistent with other works concerning the advantages of integrating asynchronous and synchronous modalities (Nortvig, Petersen & Balle, 2018). The opportunities for students to engage with the content at their own pace, and the ability to revisit challenging academic concepts, facilitated deeper learning and understanding for students through the asynchronous

components. The face-to-face or synchronous components reinforced learning through peers' collaboration and active application.

These findings align with the ideas of Graham et al. (2019), stating that hybrid instructional models support cognitive engagement through learners' meaningful interaction with, and navigation of, knowledge and skills. The observed improvement in academic scores ($\eta^2 = .12$) provides further empirical support for implementation of blended learning as a legitimate and valid alternative to traditional instruction in pre-service teacher education.

Blended Learning and Self-Efficacy

Participants showed an important overall change in self-efficacy, especially in their confidence levels with digital tools and instructional tasks. This change offers a demonstration in practice of Bandura's (1997) model of self-efficacy, which states that experiences of mastery are a key predictor of self-efficacy. Participants developed practical know-how and competence through sustained use of blended learning tools - including discussion forums, online quizzes, and multimedia - which contributed to their enhanced self-confidence.

These outcomes are in parallel with the findings by Vaughan et al. (2019) who observed the positive influence of exposure to technology-integrated learning environments on pre-service teachers' beliefs in their ability to instruct. In particular, participants identified instances to design and facilitate digital tasks as specifically effective, stating that practice-based blended experiences can truly support the development of self-efficacy.

The Role of Flexibility, Collaboration, and Resource Access

Qualitative analysis identified three major themes—flexibility, access to resources, and collaboration—as perceived facilitators of blended learning model's effectiveness. Participants appreciated the probability to plan their own learning and access materials at their convenience, as an approach that promoted their independent learning and reduced their level of stress. These findings are analogous to Picciano et al. (2020) who argued for the benefit of learner control over the learning experience which in turn improves learner engagement and satisfaction within blended learning contexts.

The incorporation of different resources, like videos, quizzes, and online discussion forums, were effective in enriching the learning experience of participants. This multimodality aligns well with the principles of communicative language teaching (CLT), which underlines authentic materials and learner-centered instruction (Boelens et al., 2018). Lastly, online and in-person collaboration both supported learning through peer learning, allowing participants to share, and build pedagogic strategies through a learning-by-doing experience evolving through a dynamic social learning context.

Challenges and Critical Considerations

In spite of the great positive feedback shared by participants, many different problems were reported which included struggling with time management that is a common element in

self-directed learning environments (Rapanta et al., 2020). Some noted technical difficulties with digital platforms, too, or even with navigating them, especially early in the intervention. These findings highlight the need for explicit scaffolding, user training, and instructor presence to alleviate the potential for withdrawal or overload.

In the meantime, although the study showed statistically significant enhancements, the moderate effect sizes demonstrates that blended learning is not a one-size-fits-all approach. Its advantages depend on the quality of the design, instructor readiness, and the support system provided to students. These considerations, which are important to the success of blended learning, are often neglected in the literature and warrant attention when planning program-wide implementations.

Implications for Language Teacher Education

The findings have significant implications for language teacher education. In the first place, blended learning serves as an educator's training in digital pedagogy, in that pre-service teachers are learning to use the very tools that they will be required to use in their future classrooms. Next, the ability to reflect about a different modality is an important aspect of a teacher's journey as they consider their own teaching practice. Lastly, blended learning helps teachers get prepared to teach in distinct, technology-rich contexts which aids in their ability to adapt and move across their new digital fluency.

Therefore, designers of programs should incorporate blended learning not just as a method of delivery, but as a model of teachers' pedagogical training to develop the skills, mindsets, and strategies for 21st century language teaching.

Limitations and Future Research

While this study offers insightful contributions to the discussion, it is also advisable to note some limitations. Most importantly, the convenience sampling applied in this study makes external validity problem. Even though the sample size was small, participants came from one institution, and all had already experienced some form of digital learning, which on its own may have impacted their ability to adapt to blended learning environments. Additionally, self-efficacy used self-reporting which has its own limitations due to personal bias.

Further research should integrate longitudinal studies to examine whether the observed achievements persist into professional practice. Comparative studies provided across disciplines, departments, institutions, and cultural settings would only serve to enrich our understanding of the role blended learning plays in different teaching contexts. Lastly, using adaptive technologies and AI-driven feedback systems represents an emerging area of inquiry that could further personalize the blended learning experience.

Conclusion

The present study examined blended learning as an effective form of teaching and learning in a teacher education program, and specifically aimed to explore pre-service language teachers'

academic engagement and self-efficacy. The results of quantitative and qualitative analyses clarified that a thoughtfully designed blended model can improve academic performance, raise teachers' confidence in teaching, and enhance learner engagement via flexible, resource-rich and collaborative settings.

In addition to confirming the instructional benefits of blended learning, the results of this study further contribute to understanding blending learning as a modality for training future teachers. Through integrating theoretical input with digital and classroom-based practice, blended learning prepares pre-service teachers to navigate modern, technology-integrated classrooms with greater pedagogical agility. These findings are particularly relevant in the field of language teacher education, where the incorporation of multimodal tools and communicative strategies is very significant.

While the benefits of blended learning and teacher education programs were evident, the study revealed challenges, such as time constraints, digital preparedness, and the need for ongoing support. The findings highlighted the significance of instructor training, instructional design, and sound institutional infrastructure when attempting to embed blended learning into teacher education programs.

As higher education institutions increasingly adapt and evolve, blended learning offers sustainable and flexible opportunities for training future educators. With the potential to develop reflective, digitally literate, and agile pedagogical practice, blended learning serves as an appealing and viable modality for teacher education in the 21st century, most notably in a continuously evolving area such as language education.

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