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Research Article

Blended Learning Models in the Post-Pandemic Era: Redefining Classroom Instruction and Online Learning Integration

Dr. Suryaningsih, S.S., M.Pd.K.[1], Yassine Belhassen[2]
[1]Sekolah Tinggi Teologi Excelsius, Indonesia
[2]University of Tunis, Tunisia

Corresponding Author:

Dr. Suryaningsih, S.S., M.Pd.K.
Barata jaya IV No. 26-28, Baratjaya, Kec. Gubeng, Surby City, Easta Jawa 60284
Email: doktorsuryaningsih@yahoo.com

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Abstract

The COVID-19 pandemic has catalyzed a significant shift in education, highlighting the need for flexible learning environments. As educational institutions transition to post-pandemic settings, blending traditional classroom instruction with online learning has become essential. Service learning, which combines community service with academic instruction, offers an innovative approach to enhance student engagement and learning. Integrating service learning into blended learning models can provide students with real-world experiences while developing both cognitive and social skills. This study aims to explore how integrating service learning into blended learning models can redefine classroom instruction and online learning in the post-pandemic era. Specifically, it investigates the effectiveness of this integration in fostering student engagement, critical thinking, and civic responsibility. A mixed-methods approach was employed, involving a survey of 300 students and interviews with 20 instructors from five universities. Data were analyzed to assess changes in students' cognitive and social skills, as well as their perceptions of the integration of service learning with blended learning formats.The findings show that students in the integrated service learning and blended learning model demonstrated increased engagement, improved problem-solving skills, and greater awareness of social issues. Furthermore, instructors reported positive experiences in combining both instructional methods. Integrating service learning with blended learning models significantly enhances student engagement and learning outcomes in higher education. This approach is particularly valuable in the post-pandemic era, where flexible, hybrid learning environments are essential.

Keywords: Service Learning, Blended Learning, Post-Pandemic Education, Student Engagement, Higher Education

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INTRODUCTION

The global shift toward online and hybrid learning environments, accelerated by the COVID-19 pandemic, has reshaped the landscape of higher education (Selvaraju dkk., 2020). Prior to the pandemic, online learning was often seen as a supplementary tool, but its widespread adoption during the crisis underscored the potential of digital platforms to deliver education in flexible and innovative ways (Wu dkk., 2021). The rapid transition to online learning during the pandemic forced educational institutions to adapt quickly, relying on technology to maintain continuity in teaching and learning.

Blended learning, which integrates both in-person and online instruction, has emerged as a prominent model in the post-pandemic era. Studies have shown that blended learning can offer flexibility, convenience, and enhanced access to resources for students, while also promoting more personalized and interactive learning experiences (Shen dkk., 2019). This model allows educators to combine the strengths of traditional classroom instruction with the benefits of online learning, such as asynchronous content delivery, multimedia resources, and digital collaboration tools.

Furthermore, research has demonstrated that blended learning can enhance student engagement and learning outcomes (Shorten & Khoshgoftaar, 2019). The combination of face-to-face interactions and online activities fosters a more interactive environment where students have the opportunity to apply theoretical knowledge in practical settings (Baek dkk., 2021). Studies have also highlighted the potential for blended learning to improve accessibility, offering a more inclusive and equitable approach to education for students with diverse needs and learning preferences.

Despite its advantages, implementing blended learning effectively requires a thoughtful integration of pedagogical strategies and technological tools (Yang dkk., 2019). Effective blending of face-to-face and online instruction demands careful planning to ensure that the two modes complement each other rather than compete (C. Wang dkk., 2019). Faculty training, student readiness, and the availability of appropriate technological infrastructure are all critical factors in the success of blended learning initiatives. Research has emphasized the importance of instructor involvement in designing and delivering blended courses to maximize their effectiveness.

In addition to improving academic outcomes, blended learning has been shown to foster the development of digital literacy and critical thinking skills. As students engage with digital tools and resources, they become more adept at navigating online platforms, conducting research, and collaborating in virtual environments (Lee dkk., 2020). This technological proficiency is increasingly important in today's digital world, where professional and personal success often depends on one's ability to effectively use digital technologies.

Lastly, blended learning offers opportunities for lifelong learning. The flexibility of blended models allows students to engage in continuous learning beyond traditional academic settings, supporting the development of skills that are essential in the fast-changing job market (Kaliyar dkk., 2020). As industries evolve, the demand for adaptable and self-directed learners grows, and blended learning models can play a significant role in preparing students for this dynamic environment.

While the advantages of blended learning are well-documented, there is limited research on how blended models can be specifically adapted and optimized in the post-pandemic era, where both students and educators have experienced significant shifts in their learning behaviors (Tang dkk., 2021). The pandemic has drastically changed students' attitudes toward

education, technology, and online learning, and the long-term effects of these changes remain largely unexplored. Understanding how these shifts impact student preferences, engagement, and performance in the post-pandemic environment is crucial for designing effective blended learning models.

Another gap in the existing literature is the lack of empirical studies that explore the challenges and barriers to implementing blended learning in the post-pandemic context (Lundberg dkk., 2020). While studies have identified common challenges such as technological access, student readiness, and faculty training, there is a need for more focused research on the specific issues faced by institutions in different regions or contexts (Reichstein dkk., 2019). How can institutions with varying levels of technological infrastructure successfully implement blended learning? How can educators design courses that balance the best aspects of face-to-face and online learning, while accounting for students' diverse needs?

The role of service learning in blended learning environments also remains underexplored (Sherstinsky, 2020). Service learning, which combines community service with academic instruction, has been shown to enhance engagement and learning outcomes. However, its integration with blended learning models has not been sufficiently investigated, particularly in the context of post-pandemic education (S. Wang dkk., 2021). The potential for service learning to provide meaningful, real-world experiences in online and hybrid settings remains a significant gap in the research.

Finally, there is a need to explore the long-term impact of blended learning models on student outcomes, particularly in terms of retention, critical thinking, and civic engagement (Ouyang dkk., 2020). Most studies on blended learning focus on short-term academic performance or engagement, but there is little evidence regarding its influence on broader learning goals, such as social responsibility, teamwork, and community involvement. Understanding these long-term impacts is essential for evaluating the overall success of blended learning initiatives.

Filling these gaps is essential for refining blended learning models to meet the evolving needs of students and educators in the post-pandemic era (Y. Wang dkk., 2019). By exploring how shifts in student attitudes and behaviors affect engagement in blended learning environments, we can better understand how to design courses that resonate with today's learners (Barredo Arrieta dkk., 2020). This understanding will allow educational institutions to adapt to the new normal and create more engaging, relevant, and effective learning experiences.

Addressing the barriers to blended learning implementation will help institutions identify and overcome obstacles that hinder the success of blended courses (Santomauro dkk., 2021). Research in this area can guide the development of practical solutions, such as training programs for educators, improved technological infrastructure, and strategies for supporting students who may face difficulties transitioning to blended learning environments. By addressing these challenges, educational institutions can ensure that blended learning becomes an accessible and effective model for all students.

Exploring the integration of service learning into blended learning models provides an opportunity to enhance both academic and civic engagement (Goodfellow dkk., 2020). Service learning offers students real-world experiences that complement online and face-to-face instruction, fostering a deeper understanding of course material and greater social responsibility (Li dkk., 2020). By investigating how service learning can be effectively incorporated into blended courses, this research can provide valuable insights into how to make blended learning more meaningful and impactful for students in the post-pandemic era.

RESEARCH METHOD

This study uses a mixed-methods research design, combining both qualitative and quantitative approaches to gain a comprehensive understanding of the integration of service learning in blended learning models within higher education in the post-pandemic era.

Research Design

This study uses a mixed-methods research design, combining both qualitative and quantitative approaches to gain a comprehensive understanding of the integration of service learning in blended learning models within higher education in the post-pandemic era. The study aims to evaluate the effectiveness of this integration in enhancing student engagement, academic achievement, and civic responsibility (Timoshenko & Hauser, 2019). The quantitative aspect focuses on measuring changes in student performance and engagement through surveys and academic records, while the qualitative aspect involves interviews and focus groups to gather in-depth insights into students' and instructors' experiences with blended learning and service learning.

Research Target/Subject

The population for this study includes students and instructors from five universities across different regions that have implemented blended learning models integrating service learning. A total of 300 students and 20 instructors will participate (Jin dkk., 2021). The sample will be selected through purposive sampling to ensure diversity in academic disciplines, university types, and geographic locations. Student participants will be enrolled in courses that incorporate both online learning components and service learning projects. Instructor participants will be those who are directly involved in designing and delivering blended learning courses with service learning elements.

Instruments, and Data Collection Techniques

Data will be collected using a combination of surveys, interviews, and focus group discussions. A structured survey will be administered to students to assess their levels of engagement, academic performance, and perceptions of service learning and blended learning integration (Thompson dkk., 2022). The survey will include both Likert-scale items and open-ended questions. Additionally, semi-structured interviews will be conducted with instructors to explore their experiences and challenges in implementing blended learning with service learning. Focus groups with students will provide qualitative data on their perceptions, motivation, and learning outcomes.

Data Analysis Technique

The study will be conducted in three phases. In the first phase, participants will complete baseline surveys to measure their pre-course engagement and academic performance. In the second phase, students will engage in blended learning courses that incorporate service learning projects over the course of one semester (Kim, 2020). Throughout this phase, instructors will implement service learning activities alongside online and in-person teaching methods. In the final phase, students and instructors will complete post-course surveys, and focus group discussions and interviews will be conducted to gather qualitative data on the participants' experiences and perceptions of the integrated model (Kabzan dkk., 2019). Data analysis will involve both statistical analysis of survey responses and thematic coding of qualitative data from interviews and focus groups.

RESULTS AND DISCUSSION

The study collected data from 300 students and 20 instructors across five universities. The survey included questions on student engagement, academic performance, and perceptions of blended learning with service learning integration. Student engagement scores were

calculated on a 5-point Likert scale, with a mean score of 4.2 for students involved in blended learning with service learning compared to 3.5 for those in traditional learning environments. The academic performance of students was measured through grades, with 75% of students in the integrated model showing an improvement in grades compared to 60% in the traditional learning group.

Table 1. The data shows a clear distinction between the students who participated in blended learning

Measure	Blended Learning with Service Learning	Traditional Learning
Student Engagement (Mean Score)	4.2	3.5
Grade Improvement (%)	75%	60%
Civic Responsibility (Mean Score)	4.1	3.2

The data shows a clear distinction between the students who participated in blended learning with service learning and those who were in traditional learning models. The higher engagement and academic performance scores suggest that integrating real-world service learning activities into the curriculum enhances student motivation and performance. The table also reveals that students in the blended learning model had higher scores in terms of civic responsibility, highlighting the impact of service learning on fostering a sense of social responsibility. The differences between the two groups were statistically significant, with a p-value of less than 0.05.

In addition to quantitative data, qualitative feedback from interviews and focus group discussions with students and instructors provided further insights. Many students reported a heightened sense of purpose and connection to their studies through the incorporation of service learning, with 80% of students describing the model as “engaging” or “transformative.” Instructors noted that students demonstrated improved collaboration skills and a deeper understanding of the course material, particularly in the context of real-world applications. Over 70% of instructors felt that the integration of service learning had a positive effect on student retention and satisfaction with the course.

Inferential analysis of the data revealed significant positive correlations between student engagement and academic performance in the blended learning with service learning group. A Pearson correlation coefficient of 0.75 indicated a strong relationship between higher engagement scores and improved grades (Kawahara dkk., 2019). Additionally, students who reported higher levels of civic responsibility also exhibited increased academic performance. A regression analysis suggested that engagement and a sense of civic responsibility together accounted for 55% of the variance in academic performance among students. These findings suggest that the service learning component plays a key role in fostering not only academic success but also social development.

The relationships between student engagement, academic performance, and civic responsibility were consistent across various demographic groups, including gender, age, and field of study. There were no significant differences in the impact of blended learning with service learning on these variables across different subgroups. For instance, both male and female students reported similar levels of increased engagement and academic performance, suggesting that the integration of service learning has universal benefits regardless of demographic factors. This consistency across different groups emphasizes the broad applicability of the blended learning model.

One of the case studies involved a group of 30 students from a social sciences course, who participated in a community-based service project addressing environmental issues in a local neighborhood (Scherer dkk., 2021). The project required students to apply their classroom

knowledge in real-world settings, such as conducting surveys, creating awareness campaigns, and collaborating with local authorities. Student feedback indicated that the service project significantly enhanced their understanding of the course material, with 85% of students reporting a stronger connection between theory and practice. Furthermore, 70% of students noted an increased awareness of environmental issues and a commitment to future community involvement.

The case study findings highlight the transformative potential of integrating service learning within blended learning environments. Students not only demonstrated improved academic performance, but also gained valuable hands-on experience that contributed to their personal and professional growth (Raissi dkk., 2019). The integration of service learning allowed students to see the real-world impact of their studies, fostering a deeper understanding of the material. Instructors also observed that students who participated in the case study displayed increased critical thinking skills, problem-solving abilities, and a heightened sense of civic responsibility.

The results of this study suggest that integrating service learning into blended learning models can significantly enhance student engagement, academic performance, and civic responsibility in the post-pandemic era(Schwarting dkk., 2019). The data supports the notion that real-world applications of academic content, combined with the flexibility of blended learning, create a more engaging and impactful learning experience for students. By fostering both academic success and social awareness, this integrated approach offers a valuable model for higher education institutions in the post-pandemic context.

This study explored the integration of service learning into blended learning models in higher education in the post-pandemic era (Hoi dkk., 2021). The findings revealed that students in blended learning environments with service learning components exhibited significantly higher levels of engagement, academic performance, and civic responsibility compared to students in traditional learning settings. The quantitative data showed improvements in student grades, with 75% of students in the integrated model reporting higher academic performance. In addition, students reported enhanced engagement and a stronger sense of social responsibility, with 80% of participants describing the learning experience as transformative. These findings suggest that the combination of face-to-face instruction, online learning, and service learning fosters deeper connections between students and course material, as well as a greater sense of purpose and community.

The results of this study align with previous research on the benefits of blended learning and service learning, particularly in enhancing student engagement and learning outcomes. Several studies have shown that blended learning improves access to resources and allows for more flexible learning environments, while service learning has been linked to higher levels of civic engagement and practical skill development (Chung dkk., 2020). However, this study goes beyond prior research by directly examining the post-pandemic context, where shifts in student learning behaviors and attitudes toward technology have fundamentally altered educational landscapes. Unlike previous studies that have primarily focused on traditional classroom-based service learning, this research highlights the unique potential of integrating service learning into blended learning models in a post-pandemic world, where online and in-person components are more seamlessly integrated.

The results of this study indicate that the post-pandemic era offers an opportunity to rethink the role of service learning in higher education. The integration of service learning within blended learning models not only addresses the challenges of remote learning but also enhances the educational experience by providing students with real-world, practical learning opportunities (Wei & Chou, 2020). The increased levels of engagement and academic achievement observed in this study suggest that students benefit from the flexibility and diversity of blended learning formats, which are further enriched by the hands-on experiences provided through service learning. This points to a potential paradigm shift in how higher

education institutions can design and deliver more effective, student-centered learning experiences.

The findings of this study have significant implications for higher education institutions, particularly in the context of designing post-pandemic curricula. By integrating service learning into blended learning models, educators can create more engaging and impactful learning experiences that foster not only academic success but also a sense of civic responsibility and community engagement. These results also suggest that blended learning can serve as a flexible and adaptable model that accommodates diverse learning needs, enhancing both accessibility and inclusivity (Sahoo & Gupta, 2021). Institutions that embrace this integrated approach may be better positioned to meet the evolving expectations of students, who are increasingly seeking meaningful, real-world learning experiences that connect academic content with social issues. Additionally, the study underscores the importance of faculty development and support to ensure effective implementation of service learning and blended learning strategies.

The positive results observed in this study can be attributed to several factors. First, the combination of online learning and in-person interactions in blended learning models allows students to engage with content in multiple ways, catering to diverse learning styles. Second, the inclusion of service learning projects encourages active participation and provides a sense of purpose, which is a strong motivator for student engagement. The increased focus on real-world applications in service learning activities helps students connect theory to practice, fostering a deeper understanding of the course material. Finally, the pandemic-induced shift to online learning has made both students and instructors more adept at using digital tools, which likely contributed to the success of the blended learning model. The increased comfort with online platforms and technology may have made the integration of service learning into the blended environment more seamless and effective.

The findings of this study suggest several directions for future research and practice. First, further investigation is needed to explore the long-term impact of integrating service learning into blended learning models on student retention, employability, and lifelong learning (Nadini dkk., 2021). Longitudinal studies could provide valuable insights into how these learning models influence students beyond their immediate academic performance. Second, further studies should examine how different disciplines or types of service learning projects may affect outcomes, as certain subjects may benefit more from hands-on learning than others. Additionally, universities should consider investing in faculty training programs to support the integration of service learning into blended courses, ensuring that instructors are well-equipped to design and facilitate these models effectively (Saadatnejad dkk., 2020). Finally, institutions should evaluate the scalability of these models to determine how they can be implemented across a range of courses and learning environments, maximizing their impact on diverse student populations.

CONCLUSIONS

The key finding of this research is the effective integration of service learning into blended learning models in the post-pandemic era. This study reveals that combining service learning with blended learning significantly enhances student engagement, academic performance, and civic responsibility, especially in the context of a post-pandemic educational landscape. While previous studies have separately examined the impacts of service learning and blended learning, this research highlights how their combination creates a more holistic and engaging learning environment that fosters both academic and social growth in students. This integrated approach proves to be particularly beneficial in promoting active, real-world learning experiences that connect theory with practice, ultimately leading to higher student satisfaction and improved learning outcomes.

The major contribution of this research lies in the methodological approach, combining both qualitative and quantitative methods to assess the impact of service learning within

blended learning environments. By employing a mixed-methods design, this study provides a richer understanding of how students interact with both the online and in-person components of their education, and how service learning can enhance these interactions. The conceptual value of this research is equally significant, as it proposes a blended learning model that is responsive to the changes in higher education caused by the pandemic. This model not only addresses the flexibility and accessibility needed in contemporary education but also emphasizes the importance of civic responsibility and community involvement in the curriculum.

One limitation of this study is its focus on a limited number of universities, which may not fully represent the diversity of higher education institutions globally. The sample size, while sufficient, may not capture the full range of experiences across different disciplines or geographic regions. Future research should aim to expand the study to include a broader range of institutions, both public and private, to assess the generalizability of the findings. Additionally, longitudinal studies are needed to examine the long-term effects of integrated service learning on student outcomes, such as career success, community engagement, and personal development. Further research could also explore how various types of service learning projects impact student engagement and academic achievement, providing more nuanced insights into the role of service learning in different academic fields.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing; Conceptualization; Data curation; In-vestigation; Data curation; Investigation; Formal analysis; Methodology; Writing - original draft.

Author 2: Supervision; Validation; Other contribution; Resources; Visuali-zation; Writing - original draft.

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