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Enhancing Student Engagement Through Blended Learning Models: A Comparative Study

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Abstract: This study aims to explore the effectiveness of blended learning models in enhancing student engagement across various educational contexts. Blended learning, which combines face-to-face instruction with digital technology, has become a popular approach in higher education. This comparative study analyzes data from two groups of students enrolled in courses with different learning models: one group using a blended learning model and the other using traditional teaching methods. Data were collected through surveys, interviews, and classroom observations to measure student engagement levels, comprehension of the material, and satisfaction with the learning methods used. The results indicate that students in the blended learning group exhibited higher engagement levels compared to those in the traditional learning group. Additionally, students in the blended learning group reported improved comprehension of the material and higher satisfaction with the learning process. This study suggests that blended learning models can be effective tools for enhancing student engagement and learning outcomes. The study also identifies key factors contributing to the success of blended learning models, including time flexibility, material accessibility, and more intensive interaction between students and instructors. The implications of this study include recommendations for curriculum development and more effective teaching strategies in higher education contexts.

Keywords: *Blended Learning, Student Engagement, Higher Education, Learning Outcomes*

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INTRODUCTION

In recent decades, digital technology has transformed various aspects of human life, including education. One of the innovations that emerged from technological advancements is the blended learning model. Blended learning combines face-to-face instruction with digital technology, providing greater flexibility and accessibility for students. This model has become increasingly popular in higher education due to its ability to enhance student engagement and learning outcomes.

Blended learning not only offers time flexibility and material accessibility but also allows for more intensive interaction between students and instructors. Recent research indicates that this learning model can improve student engagement, comprehension of the material, and satisfaction

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with the learning process. For instance, a study by Kintu, Zhu, and Kagambe (2017) found that blended learning design features such as technology quality, online tools, and face-to-face support, as well as student characteristics like attitude and self-regulation, are significant predictors of student satisfaction. Additionally, Dziuban et al. (2018) stated that blended learning has become the new traditional model in higher education, with many institutions adopting this approach to enhance student access and success.

Recent international studies have confirmed the effectiveness of blended learning in various educational contexts. For example, a study by Nkomo and Nat (2021) used educational data mining techniques to identify student engagement patterns in a blended learning environment. The results showed that students exhibited different engagement patterns based on low, medium, and high engagement levels. Furthermore, Su et al. (2023) compared student engagement in blended learning and emergency remote teaching (ERT) during the COVID-19 pandemic. They found that students receiving ERT were more engaged compared to those receiving blended learning.

Despite the numerous studies demonstrating the effectiveness of blended learning, several gaps still need to be addressed. First, most research focuses on the technical and design aspects of blended learning, while pedagogical aspects and social interactions are often overlooked. Second, studies on student engagement in blended learning frequently use survey methods that can be biased as respondents tend to overreport their activities. Therefore, this study aims to explore the effectiveness of blended learning models in enhancing student engagement by using various data collection methods such as surveys, interviews, and classroom observations.

This study will address several key questions: Is the blended learning model more effective in enhancing student engagement compared to traditional teaching methods? What factors contribute to the success of the blended learning model in improving student engagement and learning outcomes? How do students perceive their satisfaction with the learning process in the blended learning model compared to traditional teaching methods? By answering these questions, this study aims to provide recommendations for curriculum development and more effective teaching strategies in higher education contexts.

Literature Review

Blended Learning

Blended learning, which integrates face-to-face instruction with online learning, has become a prominent model in higher education. This approach leverages the strengths of both traditional and digital learning environments to create a more flexible and engaging educational experience. Recent studies have highlighted the effectiveness of blended learning in enhancing student engagement and learning outcomes.

A study by Dziuban et al. (2018) discusses the evolution of blended learning as the "new normal" in higher education, emphasizing its role in improving access and success for students. The authors argue that blended learning combines the best aspects of in-person and online instruction, providing a more comprehensive learning experience. This model has been shown to increase student satisfaction and retention rates, as it allows for more personalized and interactive learning experiences.

Another study by Istenič (2024) explores the integrated and distributed models of blended learning, highlighting the importance of educational technology in creating authentic learning experiences. The research identifies key themes and trends in blended learning, such as the integration of artificial intelligence and the shift towards more flexible learning environments. These advancements have made blended learning more adaptable to the needs of diverse student populations, further enhancing its effectiveness.

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Moreover, a systematic review by Han (2024) examines the relationships between blended learning effectiveness, student engagement, and learning outcomes. The study finds that blended learning is perceived as highly effective and engaging by students, with positive associations between its effectiveness and student learning outcomes. This indicates that blended learning not only improves engagement but also enhances academic performance.

Student Engagement

Student engagement is a critical factor in the success of educational programs, as it directly influences learning outcomes and overall student satisfaction. In the context of blended learning, engagement can be significantly enhanced through the use of interactive and flexible learning environments.

A study by Su et al. (2023) compares student engagement in blended learning and emergency remote teaching (ERT) during the COVID-19 pandemic. The findings suggest that while both modes of instruction can be effective, students receiving ERT were more engaged than those in blended learning environments. This highlights the importance of well-designed blended learning models that incorporate elements of both synchronous and asynchronous learning to maintain high levels of engagement.

Bergdahl et al. (2024) conducted a systematic review on student engagement in higher education, focusing on the use of learning analytics to measure and enhance engagement. The review reveals that most studies approach engagement using observable behavioral measures, such as clicks and task duration. However, there is a need for more comprehensive approaches that consider multiple dimensions of engagement, including emotional and cognitive aspects.

Additionally, a study by Han (2024) investigates the mediating role of student engagement in the relationship between blended learning effectiveness and learning outcomes. The results indicate that perceptions of blended learning effectiveness increase student engagement, which in turn improves learning outcomes. This underscores the importance of designing blended learning environments that actively engage students to maximize their academic success.

Higher Education

Higher education institutions have increasingly adopted blended learning models to address the diverse needs of their student populations. This shift has been driven by the need for more flexible and accessible learning environments that can accommodate various learning styles and preferences.

A study by Crompton and Burke (2023) examines the state of artificial intelligence (AI) in higher education, highlighting its potential to enhance blended learning environments. The authors discuss how AI can be used to personalize learning experiences, provide real-time feedback, and support student engagement. These advancements have made blended learning more effective and adaptable to the changing needs of higher education.

Peláez-Sánchez et al. (2024) explore the impact of large language models (LLMs) on higher education, particularly in the context of Education 4.0. The study emphasizes the role of AI in creating more autonomous, collaborative, and interactive learning environments. This aligns with the principles of blended learning, which seeks to combine the best aspects of traditional and digital instruction to enhance student engagement and learning outcomes.

Furthermore, a study by Bernstein (2023) discusses the importance of innovative pedagogical approaches in higher education, particularly in the wake of the COVID-19 pandemic. The author argues for a radical transformation of pedagogical practices to better meet the needs of today's students. This includes the adoption of blended learning models that leverage technology to create more engaging and effective learning experiences.

Learning Outcomes

Learning outcomes are a key measure of the effectiveness of educational programs, and blended learning has been shown to positively impact these outcomes. By combining traditional

and digital instruction, blended learning provides a more comprehensive and flexible learning experience that can enhance student performance.

A study by Han (2024) examines the associations between blended learning effectiveness, student engagement, and learning outcomes. The findings indicate that blended learning is positively associated with improved learning outcomes, mediated by increased student engagement. This suggests that well-designed blended learning environments can enhance both engagement and academic performance.

Another study by Su et al. (2023) compares learning outcomes in blended learning and emergency remote teaching (ERT) environments. The results show that while both modes of instruction can be effective, blended learning provides a more stable and sustainable model for improving learning outcomes. This highlights the importance of integrating both in-person and online elements to create a balanced and effective learning environment.

Additionally, a study by Bernstein (2023) discusses the role of innovative pedagogical approaches in improving learning outcomes in higher education. The author argues that blended learning models, which incorporate technology and interactive learning experiences, can better meet the needs of today's students and enhance their academic performance. This underscores the potential of blended learning to transform higher education and improve learning outcomes for diverse student populations.

METHOD

Systematic Literature Review Method

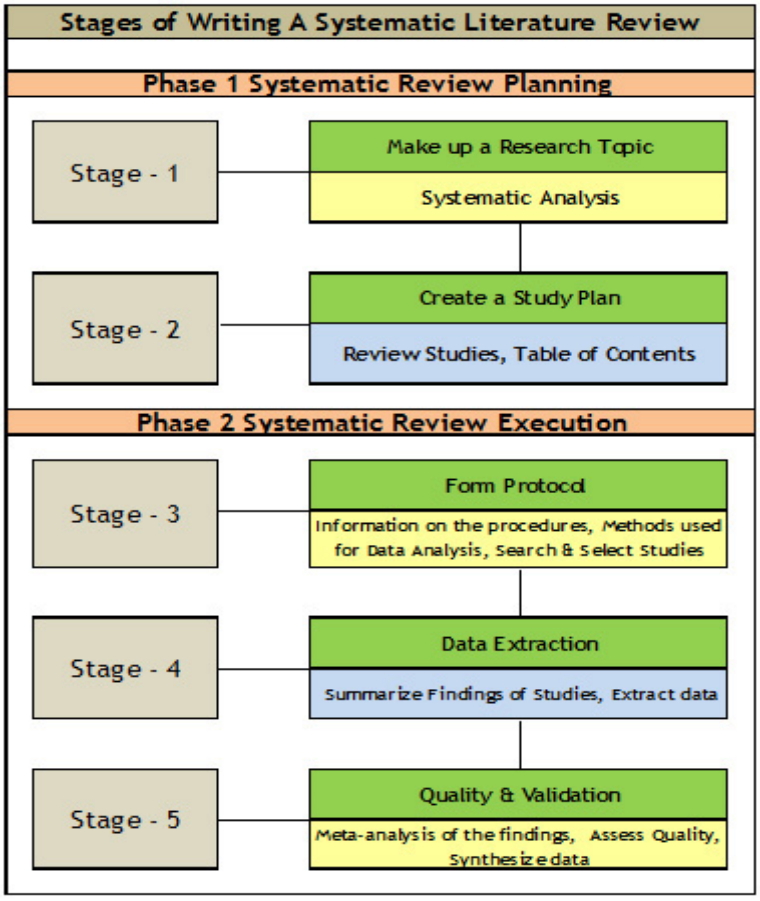

Figure 1 : Systematic Literature Review Model

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Systematic Literature Review (SER) is a research method used to identify, evaluate, and interpret all relevant research related to a specific research question, topic, or phenomenon of interest. This method aims to provide a comprehensive and unbiased summary of the existing literature by using a systematic and transparent approach.

The first step in SER is to formulate a clear and specific research question. This question will guide the process of searching and selecting the literature. Once the research question is formulated, the next step is to develop a research protocol. This protocol documents the methods that will be used in the SER, including the search strategy, inclusion and exclusion criteria, and methods for assessing the quality of the studies to be included.

The literature search is conducted using academic databases such as PubMed, Scopus, and Google Scholar. This search is performed using keywords that have been determined in the protocol. The studies found through the literature search are then selected based on the inclusion and exclusion criteria that have been established. This selection process usually involves two independent researchers to reduce selection bias.

After the relevant studies are selected, data from these studies are extracted using a prepared data extraction form. The extracted data includes information about the study design, population, intervention, outcomes, and main findings. The quality of the included studies is assessed using appropriate quality assessment tools, such as the Cochrane Risk of Bias Tool or the Newcastle-Ottawa Scale. This assessment helps identify potential biases in the included studies.

The extracted data is then synthesized to answer the research question. This synthesis can be either narrative (qualitative) or quantitative (meta-analysis), depending on the type of data available and the research objectives. The results of the SER are reported in the form of a scientific article that includes the methods, findings, and implications of the research. This reporting must be transparent and follow established reporting guidelines, such as PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).

The advantages of SER include transparency and reproducibility, as the methods used are well-documented, allowing the research to be replicated by other researchers. Additionally, SER helps reduce bias in the selection and interpretation of the literature by using clear inclusion and exclusion criteria and quality assessment of the studies. SER also provides a comprehensive summary of the existing literature, giving a more complete picture of the research topic.

RESULT AND DISCUSSION

Blended Learning Models

Blended learning models vary widely in their implementation and effectiveness. Several key figures have contributed to the development and understanding of these models, each offering unique perspectives and approaches.

Tabel 1: Blended learning models

Key Figure	Model	Description	Online Learning (%)	Face-to-Face Learning (%)	Reference
Michael Horn & Heather Staker	Rotation Model	Students rotate between different learning modalities, such as online learning and face-to-face instruction, on a fixed schedule.	50%	50%	Classifying K–12 Blended learning

Catlin Tucker	Flex Model	Students primarily learn online, with face-to-face support provided as needed. This model offers greater flexibility in terms of time and pace.	80%	20%	The Station Rotation Model: Prioritize Differentiation, Student Agency & 4Cs of 21st-Century Learning
Liz Brooke	A La Carte Model	Students take some courses online and others face-to-face, allowing for a customized learning experience.	60%	40%	4 Keys To Success Using Blended Learning Models in the Classroom and in a Remote Environment
Charles Graham	Enriched Virtual Model	Students complete most coursework online but attend face-to-face sessions for specific activities or assessments. This model aims to combine the strengths of both online and face-to-face learning.	70%	30%	What Do We Mean by Blended Learning?
Tony Bates	Blended Learning Design	Focuses on integrating online and face-to-face learning to create a cohesive and effective educational experience.	50%	50%	Discussing design models for hybrid/blended learning and the impact on the campus
Curtis J. Bonk	Blended Learning Framework	Emphasizes the importance of combining traditional and online learning to create a more engaging and effective educational experience.	50%	50%	The Handbook of Blended Learning: Global Perspectives, Local Designs

These models demonstrate the versatility of blended learning and its ability to adapt to different educational contexts and student needs. By understanding and implementing these models, educators can create more engaging and effective learning environments.

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Discussion and Analysis of Blended Learning Models

Blended learning, a pedagogical approach that combines online and face-to-face learning, has gained significant traction in educational settings due to its flexibility and potential to enhance student engagement and learning outcomes. Various key figures in the field have proposed distinct blended learning models, each with unique characteristics and proportions of online and face-to-face learning. This discussion will analyze the reasons behind the inclusion of these models and their implications for educational practice.

The Rotation Model is designed to balance online and face-to-face learning equally, with students rotating between different modalities on a fixed schedule. This model is particularly effective in maintaining structure and consistency, which can be beneficial for younger students or those who thrive in a predictable environment. By integrating both modalities, it ensures that students benefit from the interactive and personalized aspects of online learning while still receiving direct instruction and support from teachers. The fixed schedule helps in managing time effectively and provides a balanced approach to learning.

The Flex Model prioritizes online learning, with face-to-face support provided as needed. This model offers significant flexibility in terms of time and pace, making it ideal for students who require a more personalized learning experience. The high percentage of online learning (80%) allows students to progress at their own pace, access a wide range of resources, and develop self-regulation skills. The face-to-face component ensures that students receive targeted support when necessary, addressing specific challenges or reinforcing key concepts. This model is particularly beneficial for students who need to balance their studies with other commitments.

The A La Carte Model allows students to take some courses online and others face-to-face, providing a customized learning experience. This model is particularly useful in accommodating diverse learning preferences and needs. By offering a mix of online (60%) and face-to-face (40%) courses, students can choose the modality that best suits their learning style for each subject. This flexibility can enhance student engagement and motivation, as they have more control over their learning environment. It also allows for a tailored approach to education, catering to individual strengths and weaknesses.

The Enriched Virtual Model combines the strengths of online and face-to-face learning by having students complete most coursework online but attend face-to-face sessions for specific activities or assessments. This model leverages the convenience and accessibility of online learning (70%) while ensuring that critical interactions and assessments are conducted in person (30%). This approach can enhance the quality of learning by providing opportunities for hands-on activities, collaborative projects, and immediate feedback. It aims to create a balanced and effective learning experience by integrating the best aspects of both modalities.

Tony Bates' Blended Learning Design focuses on integrating online and face-to-face learning to create a cohesive and effective educational experience. By equally balancing both modalities (50% online, 50% face-to-face), this model aims to harness the benefits of each approach. Online learning offers flexibility and access to diverse resources, while face-to-face learning provides direct interaction and support. This integration can lead to a more holistic and engaging learning experience. Bates emphasizes the importance of thoughtful design in creating effective blended learning environments.

Curtis J. Bonk's Blended Learning Framework emphasizes the importance of combining traditional and online learning to create a more engaging and effective educational experience. Similar to Bates' model, it balances online and face-to-face learning equally (50% each). This framework highlights the need for thoughtful integration of both modalities to maximize student engagement and learning outcomes. By leveraging the strengths of each approach, educators can create a dynamic and responsive learning environment. Bonk's framework provides a comprehensive guide for implementing blended learning effectively.

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The inclusion of these blended learning models highlights the diversity of approaches available to educators. Each model offers unique advantages and caters to different educational contexts and student needs. By understanding and analyzing these models, educators can make informed decisions about which approach best suits their goals and the needs of their students. Ultimately, the effective implementation of blended learning can lead to enhanced student engagement, improved learning outcomes, and more flexible and personalized educational experiences.

CONCLUSION

The analysis of various blended learning models reveals a spectrum of approaches that cater to diverse educational needs and contexts. Each model offers unique advantages, emphasizing different aspects of the learning experience. The Rotation Model, proposed by Michael Horn and Heather Staker, balances online and face-to-face learning equally, providing structure and consistency that benefits students who thrive in a predictable environment. Catlin Tucker's Flex Model prioritizes online learning, offering significant flexibility in terms of time and pace, which is ideal for students needing a personalized learning experience.

Liz Brooke's A La Carte Model allows for a customized learning experience by enabling students to take some courses online and others face-to-face, accommodating diverse learning preferences. Charles Graham's Enriched Virtual Model combines the strengths of both online and face-to-face learning, ensuring critical interactions and assessments are conducted in person, thus enhancing the quality of learning. Tony Bates' Blended Learning Design integrates online and face-to-face learning to create a cohesive educational experience, leveraging the benefits of both modalities equally.

Curtis J. Bonk's Blended Learning Framework emphasizes the importance of combining traditional and online learning to create a more engaging and effective educational experience. By understanding and analyzing these models, educators can make informed decisions about which approach best suits their goals and the needs of their students. Effective implementation of blended learning can lead to enhanced student engagement, improved learning outcomes, and more flexible and personalized educational experiences. This comprehensive understanding of blended learning models provides valuable insights for curriculum development and the adoption of more effective teaching strategies in higher education contexts.

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