PAPER

Enhancing Academic Performance through Blended Learning: A Study on the Relationship between Self-Efficacy and Student Success

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ABSTRACT

This study compares the efficacy of traditional learning to blended learning, which combines in-person instruction with online learning, in terms of academic performance and self-efficacy. The two main goals of the study are to determine whether there are any significant differences in post-general self-efficacy (GSE) scores between the experimental group (EXP. G.), which participated in blended learning, and the control group (CON. G.), which only received traditional instruction, and to investigate the connection between self-efficacy scores and grade point average (GPA). The study measured self-efficacy with a pre- and post-GSE scale, evaluated academic performance using a GPA analysis, and used a quasi-experimental design with non-equivalent comparison groups. The findings showed that, in comparison to traditional learning, blended learning significantly increased students' self-efficacy. Additionally, a positive correlation between self-efficacy levels and GPA was found, suggesting that greater self-assurance was linked to better academic performance. These results offer compelling proof of how blended learning can improve academic outcomes and foster self-efficacy. Because of its potential to enhance student learning experiences and promote academic achievement, blended learning is strongly advocated in educational settings, according to the study. Blended learning provides exceptional opportunities to engage and motivate students, ultimately resulting in improved learning outcomes. It does this by fusing conventional face-to-face instruction with online educational strategies.

KEYWORDS

generalized self-efficacy (GSE), academic achievement, blended learning, flipped classrooms

1 INTRODUCTION

Recent years have seen a rise in the popularity of blended learning, which combines online and traditional classroom instruction. This momentum is fueled by

its built-in flexibility, which combines digital self-directed learning with the social fabric of traditional classrooms [1]. This movement was further accelerated by the global COVID-19 pandemic, which forced institutions to adopt blended and online methodologies in order to maintain educational continuity [2]. In order to incorporate blended learning into their curricula, many educational institutions, including those in Jordan, engaged in competition. This competition took the form of blended learning, which is defined as "the physical instructional setting or environment" and "tools or technology used to deliver or mediate instruction" [3] (p. 12). What matters more is how blended learning is implemented (i.e., how blended learning is adopted). According to [4], "what will differentiate institutions from one another will not be whether they have blended learning, but rather how [they] do the blending and where [they] fall on the blended learning spectrum" (p. 167). This suggests that in order to assess the success of the strategy and the techniques used to implement blended learning for a more fruitful exploitation of technology in education, empirical studies such as the one presented here are required.

Although blended learning is becoming more popular, which indicates its inherent potential, a thorough understanding of how it is used is still elusive. The main questions concern choosing the courses that will work best in a blended environment and thinking about how blending blended learning and the flipped classroom model might work together. According to [5], the conventional roles of lectures and homework are reversed in the latter. Teaching teachers how to use blended learning and flipped classrooms (BLFC), especially those who have always used traditional in-person instructional methods, is another challenge because this process of redesigning the instructional plan takes time and is typically met with resistance from some teachers who still think that education can only occur through face-to-face instruction [6]. There is ample evidence in the literature that many teachers are resistant to online learning [7], [6] and that many other teachers do not have access to professional development opportunities related to the use of online learning [8]. By carrying out studies such as the one in this one, more evidence for the effectiveness of blended learning on students' final achievement can be gathered, helping to partially overcome these difficulties.

In light of these considerations, this study aims to compare the effectiveness of conventional teaching methods with a BLFC approach. In particular, the study seeks to examine the impact of studying German as a second language on students' academic performance and their overall sense of self-efficacy. Given the critical role that self-efficacy plays in academic success [9], [10], [11], [12], this study endeavors to elucidate the broader effects of innovative instructional strategies on this significant psychological factor. The main objective is to evaluate how traditional teaching and the BLFC approach influence students' academic outcomes and generalized self-efficacy. To this end, the study addresses the following study questions:

RQ1: Does a significant statistical difference exist in the average scores between the experimental group (EXP. G.) (utilizing BLFC) and the control group (engaged in traditional learning) on the post-general self-efficacy (GSE) scale?

RQ2: Is there a notable statistical correlation between the average scores of the EXP. G. (employing BLFC on the post- GSE scale) and their academic achievement?

This study aims to add significant knowledge to the ongoing discussion on the effectiveness and application of BLFC methodologies by addressing the study questions above.

2 LITERATURE REVIEW

2.1 Blended learning

Higher education is increasingly embracing blended learning because of its potential to improve learning outcomes and student engagement. According to Graham's study [13], this method increases student engagement because it allows them to interact with the course material and take part in group projects at their own pace. In addition, studies show that blended learning encourages independent learning and increases student motivation [11], [14], [15], [16], [17], [18]. The advantages of blended learning include increased student motivation, flexibility, proactive learning, and a higher-grade point average (GPA). The flexible method of course delivery is one distinctive advantage of blended learning. While still enjoying the benefits of in-person engagement with teachers and peers, students can access resources and participate in online tasks at their preferred pace [19]. This adaptability is especially helpful for students who have to juggle family and work obligations, which makes it difficult for them to consistently attend class. Additionally, blended learning encourages proactive student participation. Digital tools such as discussion boards, tests, and team projects encourage students to take charge of their education by facilitating collaborative projects and peer evaluations at the same time [20]. By incorporating multimedia components and online mock-ups, blended learning also broadens the range of educational resources that are available [21], [22]. In terms of student performance, studies consistently demonstrate that blended learning is superior to traditional in-person instruction. In their meta-analysis, [23] found that blended approaches outperformed traditional approaches with a notable effect size of 0.35. Similar results were found by [24], who showed that students in hybrid environments performed better than their equivalents in conventional settings.

Although blended learning has many benefits, it can be difficult to implement effectively. Assuring that students have access to the necessary technology and resources to participate in digital components is a top priority. Educational institutions must invest in a solid infrastructure and offer dependable tech support if they want to encourage full participation in blended courses [6], [25], [26]. The painstaking creation of courses that seamlessly combine online and in-person components is another complexity. It is essential that the online components complement and harmonize with the traditional classroom teachings, in addition to being in line with the course objectives [8].

2.2 Flipped classrooms

Due to its promise to increase student engagement and academic results, the idea of "flipped classrooms" has gained popularity in higher education. In this model, students actively participate in online reading or video lectures before class, freeing up class time for discussions, group projects, and problem-solving activities. A study suggests that flipped classrooms can increase student engagement and achievement, including that conducted by [5]. Students in flipped classrooms consistently outperformed their counterparts in traditional lecture-driven environments, according to [27]. Additionally, flipped classrooms promote autonomy by letting students choose their own learning paths and actively participate in class discussions and activities [17].

The ability of flipped classrooms to create a more immersive and collaborative learning environment stands out as a key advantage. Because they are better prepared, students are better able to engage in active learning [27]. This preparation

creates the conditions for richer interactions between students and teachers in the classroom, which in turn stimulates deep learning [28]. Additionally, research by [29] and others have highlighted the effectiveness of the flipped model, specifically in language acquisition settings. Students have more opportunities to practice speaking and listening in class when classes are flipped. The time in class is used most effectively for communication-focused activities when students are first exposed to readings or videos that introduce them to new vocabulary and grammatical structures [29], [30], [28].

2.3 Student generalized self-efficacy

Student generalized self-efficacy (GSE) emerges as a key idea in the field of education. It represents a student's confidence in their capacity to complete assignments and overcome obstacles in a variety of spheres of life [9]. It reflects a student's confidence in their academic ability and resilience in confronting and overcoming obstacles in academic contexts [12], [31]. The significance of this construct is highlighted by its close relationship to academic achievement, underscoring the necessity of fostering it in educational curricula [32], [33].

Recent academic studies have shown that strategies such as flipped classrooms and blended learning are effective at increasing student engagement and improving academic results [34], [35]. As previously explained, blended learning combines online and conventional teaching strategies to balance digital independence and classroom participation [36]. As opposed to this, flipped classrooms require students to study pre-class materials and recordings, refocusing class time on discussions and real-world applications [37].

These strategies have been shown to increase student motivation and participation due to their propensity to provide a personalized, flexible academic journey [38]. The impact of BLFC on student generalized self-efficacy, particularly in the context of language acquisition, calls for closer examination. Understanding this relationship could help reveal the complex ways in which these teaching methods affect student achievement. Although comprehensive study in this area is lacking, preliminary studies suggest a positive relationship between blended learning, flipped learning, and improved student self-belief [5], [39]. It is hypothesized that the adaptability these models offer, enabling students to engage with course material in a flexible manner, may increase their confidence in their academic abilities [40].

A more in-depth academic investigation is encouraged by the complex relationship between blended pedagogies, flipped classrooms, and student generalized self-efficacy. Elevated self-efficacy is linked to better academic performance [41], and analyzing how these teaching paradigms interact with student self-efficacy can reveal more nuanced details about their overall viability and foster learners' fortified self-belief [42]. Although the evidence is still in its infancy, it suggests that blended and flipped learning methodologies may strengthen student self-efficacy, leading to improved academic success [29].

2.4 Blended learning with flipped classrooms

The BLFC method, which combines face-to-face and online learning strategies, has gained popularity in recent years among professors of undergraduate languages.

The online component typically includes pre-recorded lectures, readings, and quizzes so that students can get ready before going to physical classes. Interactive and group exercises are prioritized during class time [43]. The goal of the BLFC method is to increase student engagement and achievement by providing a flexible, individualized learning environment.

The effectiveness of the BLFC framework for undergraduate language instruction has been the subject of numerous studies, with varying degrees of success. According to research [36], students who are immersed in a blended environment perform academically better than their counterparts in traditional settings. Beyond academic advancement, the effect of the BLFC on student self-efficacy has drawn attention. Research indicates that BLFC can increase this sense of self-assurance, with students expressing increased motivation and confidence [44], [45]. Self-efficacy is a measure of one's confidence in carrying out particular tasks.

However, there is some disagreement in the academic discussion of BLFC. Several studies indicate that blended learners experience higher levels of stress and anxiety compared to traditional students [46]. This might be a result of the increased autonomy and workload that come with blended setups. The data also reveal the potential difficulty faced by English language learners. The independent components of blended learning may be difficult for students with limited English proficiency, which could hinder their progress [47], [48].

In conclusion, the BLFC paradigm presents a promising avenue for undergraduate language instruction, but in-depth investigation is necessary to fully understand its implications, particularly with regard to how it affects academic achievement and self-belief.

3   METHODOLOGY

3.1   Participants

Undergraduate students from the University of Jordan who studied the German Grammar course are participants in this study. The course was divided into two sections: one utilized conventional teaching strategies (control group), and the other employed a blended learning model, incorporating flipped classrooms (EXP. G.). Both sections were instructed by the same teacher. Each section initially comprised 50 students. However, participation in the study included 37 students from the control group (CON. G.) and from the EXP.G. 39 students. Further details regarding participant selection are provided below.

3.2   Context

The University of Jordan's German grammar course is taught by seasoned native German speakers. The course curriculum covers a wide range of German grammatical topics, starting with basic concepts and progressing to more complex ones. The teaching approach combines lectures, exercises, and interactive activities while putting a priority on student participation and engagement.

Additional resources are essential for improving the learning process. Textbooks, online learning tools, and language lab resources are some examples of those that help students practice and improve their grammar skills while also providing

helpful feedback on their progress. A number of tests and assignments contribute to the final grade, making assessments an essential component of the curriculum. The entire course gives students a solid foundation in German grammar rules and how they are used in everyday conversation. It also lays a strong foundation for continuing with advanced language studies or using the language in practical situations.

3.3 General design

This study compares the effects of traditional learning and blended learning in flipped classrooms on student generalized self-efficacy and academic achievement using a quasi-experimental design. The results of the study were assessed using a pre- and post-tests design.

3.4 Instruments

In the current study, two different instruments were used to measure important variables. The generalized self-efficacy scale (GSES), developed by [49], was the first of these. The 10-item GSES, which has received praise for its validity and reliability, was designed to gauge a person's confidence in their capacity to handle a variety of difficult circumstances. It is used as a tool to assess participants' perceptions of their self-efficacy, providing insight into how confident they are in their capacity to overcome challenges and complete various tasks. Also, the GPAs of students at the end of the semester were collected. The study made an effort to take into account both the subjective self-efficacy experiences of students and the objective measures of their academic performance by using both of these questionnaires. This systematic approach made it easier to explore the relationship between self-efficacy and academic success in a comprehensive way.

3.5 Procedure

An assessment of baseline levels of generalized self-efficacy within each group was conducted prior to the start of the Fall 2022 semester. As part of this pre-test, both groups completed the generalized self-efficacy scale.

Students in the traditional learning section attended in-person classes and learned from the professor in a lecture-based format. The blended learning section, on the other hand, used a blended learning model with flipped classrooms. Students in this model would watch pre-recorded lectures or read assigned readings prior to class, and class time would be devoted to collaborative learning activities such as group discussions or problem-solving exercises. The same instructor taught the same material and administered the same exams in both sections, despite the different formats.

A post-test that included both groups' answers to the GSES was given at the end of the semester. This post-test was given right before the final tests. To identify any appreciable variations in students generalized self-efficacy between the traditional learning section and the blended learning section, the data collected from the pre-test and post-test were compared.

3.6 Research design

The current study employs a quasi-experimental design, specifically a non-equivalent comparison group design, to examine the impact of blended learning on student performance, as follows:

EXP. G. O X O

CON. G. O–O

This design was selected for its appropriateness in real-world educational settings where random assignment to conditions is often not feasible due to ethical considerations or logistical constraints. There are two distinct groups involved: an EXP. G. and a CON. G. The EXP. G. comprises students who are exposed to the BLFC approach (represented by the "X" in the design notation), while the CON. G. contains those who experience traditional learning methods. Each group is evaluated before (pre-test, denoted by "O") and after the intervention (post-test, denoted by another "O"), which facilitates the comparison of their performance scores on the post- GSE scale. The notation "-" for the CON. G. indicates the absence of the BLFC intervention.

Importantly, the reliability of the GSE scale was tested. The calculated Cronbach's alpha was 0.873 based on the 10 items of the scale, suggesting a high degree of internal consistency and thus signifying that this tool is indeed reliable and suitable for this study's purposes.

3.7 Data analysis

In this study, we conducted a meticulous analysis of data collected via questionnaires, employing a combination of descriptive and inferential statistical methods. Descriptive statistics were primarily utilized to outline the fundamental characteristics of the data, focusing on the calculation of means and standard deviations. These metrics were crucial for summarizing the data and providing a comprehensive understanding of the quantitative details. Additionally, inferential statistics were applied to identify significant differences between the two groups under study, particularly in relation to their GSE and academic performance.

Furthermore, to heighten the precision of our findings and account for potential covariates that could influence the dependent variable, we incorporated analysis of covariance (ANCOVA). The deployment of ANCOVA was crucial in identifying significant disparities in the mean scores of the experimental and control groups. All these statistical processes were executed using the Statistical Package for the Social Sciences (SPSS), version 26. This sophisticated software ensures accurate and streamlined analysis and interpretation of statistical data, thereby reinforcing the credibility of our study conclusions.

The in-depth analysis using these rigorous statistical techniques was vital to tackling the main study question: Does a significant statistical difference exist in the average scores between the EXP. G. (utilizing BLFC) and the CON. G. (engaged in traditional learning) on the post-GSE scale?

4 RESULTS

4.1 Demographics

A total of 76 students participated in the study, of which 37 were part of the control group and 39 in the experimental group. The gender distribution across

both groups revealed a substantial female majority, with 60 female participants and only 16 males. A comprehensive breakdown of the demographic characteristics, including age, education level, and other pertinent details, for all participants from both the control and experimental groups, is exhaustively detailed in Table 1.

Table 1. Demographic characteristics of the participants

| | | | Gender | | Total |
			Female	Male	
Group	Experimental	Count	32	7	39
		% within GROUP	82.8%	17.2%	100.0%
	Control	Count	28	9	37
		% within GROUP	76.6%	24.4%	100.0%
Total		Count	60	16	76
		% within GROUP	78.9%	21.1%	100.0%

RQ1: *Does a significant statistical difference exist in the average scores between the* EXP. G. *(utilizing BLFC) and the* CON. G. *(engaged in traditional learning) on the post-GSE scale?*

The objective of study question 1 is to examine whether there exists a statistically significant difference between the mean scores of two distinct groups. The first group, referred to as the EXP. G, adopted a blended learning approach that encompasses a mix of traditional classroom teaching and online instructional methods. On the other hand, the CON. G. utilized traditional learning techniques solely. This comparative analysis was done using the post- GSE scale, a tool used to measure the belief in one's own ability to accomplish tasks and reach goals. Both the means and standard deviations for each group were calculated, both before (pretest) and after (post-test) the application of the respective learning methods. The results, represented in Table 2, provide a comprehensive outlook of the experimental outcomes. By assessing these results, it was intended to identify any significant variations between the two groups, which can potentially affirm the efficacy of BLFC compared to traditional learning methods.

Table 2. Means and standard deviations of the experimental group, who used blended learning and flipped classrooms, and the control group in the pre- and post-tests of the general self-efficacy scale

GSE	Group	N	Mean	Std. Deviation
Pretest	Experimental	39	27.90	6.201
	Control	37	24.94	4.643
Posttest	Experimental	39	29.59	5.382
	Control	37	25.41	4.705

Table 2 presents the discernible differences in the mean scores of the pretest and posttest on the GSE scale between the two groups. To ascertain the significance of these differences, an ANCOVA was employed. ANCOVA is typically utilized in experimental studies to control the effects of a prior variable, such as using pretest scores

as covariates in pretest-posttest experimental designs. The details of this analysis can be found in Table 3.

Table 3. Tests of between-subjects effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pretest	948.430	1	948.430	188.178	0.000	0.814
Group	31.166	1	31.166	6.184	0.017	0.126
Error	216.723	43	5.040			
Corrected Total	1351.913	45				

Table 3 shows that there was a significant effect of using blended learning against the traditional face-to-face method. F-value was 6.184 (significant at 0.017), which means that the p-value was less than 0.05, which indicates that blended learning increases the GSE among students who learned using it. Table 3 also shows the effect size of applying blended learning by using Partial Eta Squared. Its value was 0.126 according to the group, which means 12.6% was the explained variance between groups which can be explained according to the method of blended learning. However, the value of Partial Eta Squared indicates a medium effect size according to [50].

RQ2: *Is there a significant statistical correlation between the average scores of the* EXP. G. *(employing BLFC on the post-* GSE *scale) and their GPA?*

The second study question in this study was to ascertain whether a statistically significant relationship exists between the average scores of the EXP. G–that utilized BLFC–on the post- GSE scale, and their GPA. To investigate this, the Pearson correlation coefficient was computed, yielding a value of 0.379. This value indicates a moderate positive correlation, suggesting that as BLFC utilization and post- GSE scores increase, so does the GPA. The r-squared value of 0.143 further highlights that approximately 14.3% of the variance in the GPA can be explained by the variance in the self-efficacy scores. The regression analysis was determined to be significant as presented in Table 4 of the study. This data suggests that employing blended learning methods may improve students' GSE and GPA, though additional factors also play a role.

Table 4. ANOVA for regression

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.176	1	1.176	4.516	.043
Residual	7.030	27	0.260		
Total	8.205	28			

The process was completed, resulting in the calculation of the coefficients of the regression line equation. These essential numerical values, which indicate the direction and strength of the relationship between variables, were accurately determined. The resultant coefficients have been clearly documented in Table 5. By examining this table, one can gain an understanding of the impact each independent variable has on the dependent variable in the regression model.

Table 5. The coefficients of the regression line equation to predict the grade point average from the general self-efficacy scores

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	2.128	0.538		3.951	0.001
GSE	0.038	0.018	0.379	2.125	0.043

According to Table 5, we can employ a statistical tool known as a regression line equation to predict the GPA of a student from their GSE scores. The equation reads as follows: GPA = (0.038*GSE) + 2.128. To elaborate, this suggests that for every one-point increase in a student's GSE score, their predicted GPA would rise by 0.038 points, holding all other factors constant. The constant, 2.128, represents the expected GPA when the GSE score is 0. Therefore, this equation forms a useful predictive tool for understanding the relationship between a student's self-efficacy and their academic performance.

5   DISCUSSION

The purpose of this study was to investigate the impact of blended learning on students' overall self-efficacy and its relationship to academic achievement measured by GPA. The results showed that blended learning, as opposed to conventional face-to-face instruction, had a significant impact on raising students' overall self-efficacy. This was accomplished using a quasi-experimental model with a non-equivalent control group. These findings support earlier research that emphasized the value of blended learning in raising academic achievement and motivation levels in students.

An ANCOVA was used to determine the mean differences between the blended learning and traditional face-to-face groups. This method is well known for adjusting for variations in initial test scores. Data analysis showed that the blended learning cohort outperformed the traditional face-to-face cohort by a significant margin on the GSE scale post-assessment. In line with the [50] definition, the partial eta squared value identified a moderate impact of blended learning on overall self-efficacy.

Our results highlight blended learning's potential to increase students' academic achievement and motivation, supporting earlier findings [1], [23]. The findings of this study demonstrate that flipped classrooms and blended learning have a positive effect on students' academic self-efficacy when learning German grammar. This effect may be explained by the nature of the blended learning methodology, which fosters a less stressful environment and increases access to online resources so that students are not constrained to a single tool (i.e., the textbook) in their quest to learn a foreign language. The benefits of interpersonal dynamics and instructor-student interactions are combined with the adaptability and scope of online modules in blended learning, which combines the best aspects of both in-person and digital instruction [51]. According to [1], [52], [53], and other researchers, this combination increases student empowerment by boosting their autonomy in learning, intensifying their commitment, and ultimately elevating their overall self-efficacy.

In order to answer the secondary study question, this investigation examined the relationship between students' overall self-efficacy and academic success as measured by their GPA. A moderately strong positive relationship between GSE and GPA was found by the evaluation, indicating that students who have higher levels of

self-efficacy typically have higher GPAs. This result is in line with a substantial body of study that consistently shows a connection between self-efficacy and academic performance [54], [10], [9], [55], [56], [33], [57].

The relationship between self-efficacy and academic performance suggests that students who exhibit self-confidence are more likely to achieve academically. Higher levels of self-efficacy encourage students to set challenging goals, show resiliency in the face of difficulties, and put effort into their academic success. This ingrained conviction fosters an attitude of proactive learning, boosting resilience and motivation, and leading to academic excellence [9].

In conclusion, our analysis highlights the crucial role that self-efficacy plays in academic success. Therefore, educational programs should concentrate their efforts on enhancing student self-efficacy. The results also support blended learning as a key pedagogical tool that improves students' overall self-efficacy and fosters better academic results. Blended learning gives students more control over their learning trajectory, revs up their engagement, and raises their overall self-efficacy by combining the benefits of both in-person and online instruction.

6   LIMITATIONS

Despite the fact that the study's findings provide useful information about blended learning, there are some limitations that should be noted. First of all, the use of a quasi-experimental design, distinguished by a non-equivalent control group, may result in selection biases. Our ability to infer solid causal relationships might be constrained by this design. Future studies should use a randomized controlled trial methodology to accurately determine the effects of blended learning.

Second, there are potential issues because the study relies heavily on self-report instruments, such as the GSE scale. Due to the fact that these tools are based on personal perceptions, they can contain subjective biases in both reporting and self-evaluation. Future studies should think about including more objective measurement techniques and incorporating a wider range of data sources to strengthen the reliability and validity of the results.

Last but not least, the study's temporal framework primarily captures the immediate effects of blended learning. Academic achievement and student self-efficacy are just two examples of the many factors that persistent influence has on. Future efforts should look into the long-term effects of this pedagogical approach in order to get a comprehensive picture of its effects.

In light of these limitations, the study not only highlights the need for additional study, improved methodologies, and a wider temporal lens in order to gain a more thorough understanding of the subject, but it also provides valuable contributions to the discourse on blended learning.

7   CONCLUSION

In light of the objectives of this study, which compared the effectiveness of blended learning with traditional learning in terms of academic achievement and self-efficacy, the findings strongly imply that blended learning has a significant amount of potential to increase self-efficacy and improve educational outcomes. This study adds empirical data to the body of studies demonstrating how blended learning improves students' overall self-efficacy and academic performance. The

results support prior studies and highlight the critical role of self-efficacy as an accurate predictor of academic success. Comparing blended learning to conventional face-to-face instruction, it was discovered that students' self-efficacy was significantly increased. Additionally, a positive correlation between self-efficacy levels and GPA was found, indicating that students with higher levels of self-assurance typically outperform their peers in the classroom. It is strongly advised that educators and educational institutions adopt blended learning strategies more widely in light of these results. Blended learning creates a dynamic and engaging learning environment that increases student motivation and achievement by integrating online components into conventional in-person instruction. Determining the long-term effects of blended learning on students' self-efficacy, academic success, and enthusiasm is therefore crucial. The best methodologies may be determined by future studies that compare and contrast various blended learning frameworks. Teachers can improve their teaching strategies and increase the benefits for their students by having a deeper understanding of the specific factors that blend learning depends on to succeed.

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