



THE IMPACT OF TEAM TEACHING ON STUDENT ACHIEVEMENT AND PERCEPTIONS IN AVIATION VOCATIONAL SCHOOLS

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ABSTRACT

This research highlights the significance of collaborative teaching in addressing the diverse learning challenges faced by cadets, as statistical analysis indicates that team teaching strategies can significantly enhance English learning outcomes compared to traditional methods, thus supporting the educational rights of all students. The research aims to investigate the differences in academic performance between students taught using team-teaching strategies and traditional teaching methods in vocational aviation schools, employing a quantitative ex post facto comparative analysis to measure the impact of these teaching strategies on English learning outcomes, supported by statistical data from Polytechnic Penerbangan Surabaya and Polytechnic Penerbangan Medan. Our findings indicate a statistically significant difference in academic performance, with team teaching students achieving higher average scores ($M = 85.4$, $SD = 3.2$) compared to traditional teaching students ($M = 78.6$, $SD = 4.1$), $p < 0.05$. The collaborative nature of team teaching promotes professional development among educators, leading to improved instructional strategies and teaching quality. Educators are encouraged to adopt team teaching strategies to enhance student engagement and learning outcomes, as evidence demonstrates their effectiveness in fostering a more inclusive and supportive educational environment.

Keywords: *Collaborative Teaching; English Learning Outcomes; Quantitative Analysis; Team Teaching; Vocational Aviation Schools.*

ABSTRAK

Penelitian ini menyoroti pentingnya pengajaran kolaboratif dalam mengatasi berbagai tantangan pembelajaran yang dihadapi oleh para taruna, karena analisis statistik menunjukkan bahwa strategi pengajaran tim dapat secara signifikan meningkatkan hasil pembelajaran bahasa Inggris dibandingkan dengan metode tradisional, sehingga mendukung hak-hak pendidikan semua siswa. Penelitian ini bertujuan untuk menyelidiki perbedaan kinerja akademik antara siswa yang diajar menggunakan strategi pengajaran tim dan metode pengajaran tradisional di sekolah penerbangan kejuruan, dengan menggunakan analisis komparatif ex post facto kuantitatif untuk mengukur dampak dari strategi pengajaran ini terhadap hasil pembelajaran bahasa Inggris, didukung oleh data statistik dari Politeknik Penerbangan Surabaya dan Politeknik Penerbangan Medan. Temuan kami menunjukkan perbedaan yang signifikan secara statistik dalam kinerja akademik, dengan siswa yang mengikuti pengajaran tim mencapai nilai rata-rata yang lebih tinggi ($M = 85,4$, $SD = 3,2$) dibandingkan dengan siswa yang mengikuti pengajaran tradisional ($M = 78,6$, $SD = 4,1$), $p < 0,05$. Sifat kolaboratif dari pengajaran

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tim mendorong pengembangan profesional di antara para pendidik, yang mengarah pada peningkatan strategi instruksional dan kualitas pengajaran. Kami mendorong para pendidik untuk mengadopsi strategi pengajaran tim untuk meningkatkan keterlibatan siswa dan hasil belajar, karena bukti menunjukkan efektivitasnya dalam mendorong lingkungan pendidikan yang lebih inklusif dan suportif.

Kata Kunci: *Pengajaran Tim; Pengajaran Kolaboratif; Hasil Belajar Bahasa Inggris; Sekolah Penerbangan; Analisis Kuantitatif*

INTRODUCTION

Team-teaching has emerged as a pivotal educational strategy, particularly in diverse learning environments where the needs and backgrounds of students vary significantly (Villavicencio et al., 2021; Sanger, 2020). An instructional approach involving two or more professionals delivering substantive teaching to a diverse group of students in a shared space, team-teaching fosters collaboration between educators, often combining general education teachers with special education specialists (Tallman, 2021; Griffiths et al., 2021; Govindarajoo et al., 2023). This collaborative model aims to enhance educational equity, ensuring that all students, regardless of their individual needs, receive quality instruction (Estefan et al., 2023; Garcia Ramos & Wilson-Kennedy, 2024). In Indonesia, the perception of education as a universal right has necessitated a shift towards inclusive teaching methodologies, particularly in response to the increasing diversity of student populations and their learning styles (Kurniarizki & Prasetyarini, 2023; Gai Mali et al., 2023; Yasin et al., 2023; Miyarti et al., 2024; Nurjanah et al., 2024)). The current educational landscape in Indonesia reflects a significant transformation driven by the need to accommodate diverse learners (Jayadi et al., 2022; Hadi et al., 2023; Hakim, 2023). The shift from traditional teaching methods—predominantly characterized by direct instruction and lecture-based delivery—to more interactive and collaborative pedagogies has been necessitated by the recognition of varied learning preferences among students (Tai, 2022; Zhao & Watterston, 2021; Gu, 2021). Team-teaching represents a crucial strategy in addressing the educational needs of heterogeneous classrooms. This approach not only enhances educational outcomes but also provides a framework for teachers to share responsibility in planning, instruction, and assessment, thereby improving the overall learning experience for students (Khan, 2023; Graham et al., 2023; Volkova et al., 2021)

Recent studies have underscored the effectiveness of team-teaching in various educational contexts, revealing that collaborative teaching not only benefits students academically but also fosters a sense of community among educators (Shirley et al., 2020; de Vries et al., 2020; Sachmpazidi et al., 2021). Team-teaching led to improved teacher satisfaction and reduced feelings of isolation, common in traditional teaching settings. This collaborative environment encourages educators to share best practices and develop more effective instructional strategies, ultimately benefiting students. Team-teaching can lead to enhanced student engagement and motivation, particularly when educators integrate varied teaching styles and approaches (Kitsantas et al., 2021; Thoma et al., 2023). The importance of team-teaching is particularly evident in Indonesia, where the educational system must adapt to a rapidly changing demographic landscape (Rasmitadila et al., 2022). The rise in cultural diversity among students, along with varying academic abilities

and socio-economic backgrounds, has highlighted the necessity for instructional methods that can cater to all learners (Molloy & Farrell, 2024; Woodcock et al., 2022). Team-teaching allows for a more personalized approach, offering different perspectives and expertise that can meet the needs of students who may struggle in traditional classroom settings (Woodcock et al., 2022). By facilitating collaboration between teachers, this model promotes a more inclusive environment where students feel supported and engaged (Estefan et al., 2023; Govindarajoo et al., 2023; Grosche & Moser Opitz, 2023; Gurjar & Bai, 2023).

Despite the growing body of literature supporting team-teaching, gaps remain, particularly in quantifying its impact on student learning outcomes in vocational education settings (James et al., 2020; Brion, 2020; Hiim, 2023; Ecton & Dougherty, 2023). Previous studies have predominantly focused on qualitative assessments of team-teaching efficacy, often neglecting quantitative analyses that could provide statistically significant insights into its effectiveness (Hempel et al., 2020; Ainsworth, 2021; Pellegrini et al., 2021; Dron & Anderson, 2023; Lim et al., 2023). This is particularly concerning in vocational education, where practical skills and language proficiency are critical for student success (Creaven, 2024; C. Griffiths, 2024; Lee et al., 2024). The need for effective teaching strategies in vocational contexts is underscored by the demands of the job market, which increasingly values not only technical skills but also communication abilities in English, especially in fields such as aviation (Rashid & Teslenko, 2020; Ng et al., 2023). To address these gaps, recent research has begun to quantitatively assess the impact of team-teaching on student outcomes (Dignath et al., 2022; Dadvand et al., 2024; Estaiteyeh & DeCoito, 2023). The effects of team-teaching on English language proficiency among vocational students revealing statistically significant improvements in test scores for those exposed to collaborative teaching methodologies compared to traditional instruction (Chen et al., 2023; Shin & Kim, 2024; Lee et al., 2024). This aligns with findings from a meta-analysis conducted, which emphasized that collaborative teaching approaches can have a substantial positive effect on student achievement (Tallman, 2021; Griffiths, et al., 2021; Balta et al., 2023; Grosche & Opitz, 2023).

This study aims to fill the identified gap in the literature by examining the differences in English language learning outcomes between students taught through team-teaching methodologies and those instructed via traditional teaching methods in aviation vocational schools in Indonesia. The focus on English language proficiency is essential, given that English is often the medium of instruction in many technical fields and is crucial for students' future employability. By investigating the impact of team-teaching on English outcomes, this research seeks to contribute valuable data that can enhance educational practices and inform policy decisions. Specifically, this research seeks to address the following aims: first, to identify whether significant statistical differences exist in English learning outcomes between students taught via team-teaching and those in traditional classrooms; second, to evaluate the influence of team-teaching strategies on students' academic performance; and third, to explore students' perceptions of team-teaching in comparison to traditional instructional methods. By systematically investigating these dimensions, this study will provide insights into the effectiveness of team-teaching as a pedagogical strategy in vocational education, thereby contributing to a deeper understanding of its impact. The novelty of this research lies in its

quantitative comparative approach, targeting aviation vocational students in Indonesia—an area that has received limited scholarly attention. While team-teaching has been explored in various educational contexts, its specific application within vocational education, especially in aviation, remains underrepresented in academic discourse (Owais et al., 2020; Ng et al., 2023; Charles & Abu-Ayyash, 2024). This study aims to provide empirical evidence that will not only bridge the existing literature gap but also advocate for the broader adoption of team-teaching practices in vocational education. The findings are expected to have significant implications for educational stakeholders, including policymakers, educators, and curriculum developers, by highlighting effective instructional strategies that enhance student engagement and academic achievement in diverse learning environments.

In addition to addressing the gaps in the literature, this research will also explore the practical implications of team-teaching in the classroom. By gathering quantitative data on student performance, the study aims to provide a clearer picture of how collaborative teaching approaches can lead to improved learning outcomes. Furthermore, understanding students' perceptions of team-teaching compared to traditional methods will offer valuable insights into how educational practices can be refined to better meet the needs of diverse learners. The significance of this study extends beyond the immediate context of aviation vocational education. As Indonesia continues to prioritize educational reforms that promote inclusivity and equity, findings from this research can inform broader educational policies and practices (Karolina et al., 2021; Kholiq et al., 2022; Yasin et al., 2023). The emphasis on team-teaching may encourage institutions to adopt more collaborative approaches, ultimately benefiting a wide range of students across different fields of study (Hempel et al., 2020; Denić & Petković, 2023; Estaiteyeh & DeCoito, 2023; Mentzer et al., 2024; Elo & Uljens, 2024). By highlighting the advantages of team-teaching, this research seeks to inspire a shift in educational paradigms towards more inclusive and effective teaching practices. Moreover, the emphasis on collaboration in team-teaching aligns with global educational trends that prioritize student-centered learning and the development of 21st-century skills (Sjølie et al., 2021; Hard & RaoShah, 2022). As educational systems worldwide adapt to the demands of a rapidly changing job market, fostering collaboration among educators becomes increasingly vital (Rosenbusch & Morrison, 2020; Turner & Baker, 2020). Research by UNESCO indicates that collaborative teaching environments are more likely to produce graduates who are adaptable, innovative, and capable of working effectively in teams—skills that are essential in today's workforce (Loes, 2022; Qiu, 2022; Cradit et al., 2024).

This study represents an important step in understanding the role of team-teaching in enhancing educational outcomes for students in vocational education, particularly within Indonesia's aviation sector. By focusing on English language learning outcomes and student perceptions, the research aims to provide comprehensive insights into the effectiveness of collaborative teaching strategies. Ultimately, the findings will contribute to the development of a more inclusive educational system that recognizes and addresses the diverse needs of all learners. As the landscape of education continues to evolve, embracing innovative teaching methods such as team-teaching will be essential in preparing students for success

in their future careers. Through this research, there is potential not only to improve educational practices within vocational education but also to influence broader educational reforms that prioritize inclusivity and quality instruction for all students.

METHOD

This study utilized a quantitative comparative ex post facto design to examine the effects of team teaching on academic achievement and student perceptions in vocational aviation schools (Ng et al., 2023; Han & Bailenson, 2024). The research will be conducted at two selected institutions: Politeknik Penerbangan Medan and Politeknik Penerbangan Surabaya.

The population for this study consists of students enrolled in English language courses at both institutions. A stratified random sampling technique will be employed to ensure that students from both traditional and team teaching environments are represented. The sample size will be calculated to maintain statistical power, considering the expected effect sizes based on previous research.

Data collection will involve administering a structured questionnaire to assess students' perceptions of team teaching methods, along with a standardized assessment to measure academic achievement (Gore et al., 2021; Graham et al., 2023). The questionnaire will include Likert-scale items to quantify students' attitudes and perceptions towards the teaching strategies employed (Nguyen et al., 2021; Cents-Boonstra et al., 2022; Harper & Parkin, 2024). Final exam scores in English will serve as the dependent variable, providing a measurable outcome of academic performance. The instruments used in this study will be carefully developed and validated (Fitzgerald et al., 2020; Elangovan & Sundaravel, 2021; McCulloch et al., 2023). The perception questionnaire will undergo expert review to ensure content validity, with input from experienced educators and researchers in the field (Elangovan & Sundaravel, 2021; Das & Bhattacharjee, 2023). Evidence of this validation process will include feedback summaries from the expert reviewers, demonstrating that the items accurately reflect the constructs being measured (Hand & Khan, 2020; Myllyaho et al., 2021; Darvishi et al., 2024; Pandian et al., 2023). Furthermore, a pilot study will be conducted involving 100 students to assess the reliability of the instrument. Internal consistency will be measured using Cronbach's alpha, with a target value of 0.70 or higher indicating acceptable reliability (Roopesh, 2023; Friesen et al., 2023; Colledani et al., 2024). Previous studies using similar instruments have reported Cronbach's alpha values ranging from 0.75 to 0.90, confirming their effectiveness (Elangovan & Sundaravel, 2021; Nguyen & Habók, 2024).

For data analysis, statistical software will be utilized to perform descriptive and inferential statistics (Zelner et al., 2022). Descriptive statistics will summarize demographic information and response distributions. Inferential statistics, such as t-tests or ANOVA, will be conducted to determine significant differences in academic performance between students in traditional and team teaching settings (Friesen et al., 2023; Molloy & Farrell, 2024). Additionally, correlation analysis will explore the relationship between students' perceptions and their academic outcomes. To ensure rigor, validation of data collection instruments will be achieved through both expert review and pilot testing, enhancing the reliability and validity of the findings.

(Almutairi & Alsuwayl, 2023; Thomas et al., 2023). The comprehensive validation process will ensure that the instruments are both relevant and effective in capturing the necessary data for this study.

Findings

The study aimed to investigate the first question research whether there is a significant difference between team teaching strategies and traditional learning methods regarding English language achievement among students in aviation vocational schools. The results of the analysis provide compelling evidence regarding the effectiveness of these two instructional approaches. In terms of pre-test scores, the team teaching group had an average score of 71.41 with a standard deviation of 3.90, indicating a relatively consistent performance among the students prior to the implementation of the teaching strategy. In contrast, the traditional teaching group exhibited a higher pre-test average of 77.01, accompanied by a standard deviation of 6.25, suggesting slightly greater variability in their initial performance levels. Upon transitioning to the post-test, significant changes were observed. The team teaching group demonstrated a remarkable increase in their average score, rising to 82.97 with a standard deviation of 6.48. This increase reflects a substantial improvement in student learning outcomes attributable to the collaborative nature of the team teaching approach. Conversely, the traditional teaching group showed only a marginal increase in their post-test scores, reaching an average of 77.07 with a standard deviation of 6.21. This minimal change indicates that traditional methods may not foster the same level of growth in language proficiency compared to team teaching. The following table summarizes the pre-test and post-test statistics for both teaching methodologies:

Table 1 Summarizes the Pre-Test and Post-Test

Methodology	N	Pre-Test Mean	Pre-Test Std. Deviation	Post-Test Mean	Post-Test Std. Deviation
Team Teaching	100	71.41	3.90	82.97	6.48
Traditional Teaching	100	77.01	6.25	77.07	6.21

The data clearly indicates that the team teaching strategy not only resulted in a higher post-test average but also showed substantial improvement from pre-test to post-test. The average increase of 11.56 points in the team teaching group underscores the effectiveness of collaborative teaching environments, which are characterized by shared responsibilities among instructors and increased opportunities for student engagement. In contrast, the traditional teaching group's average increase of only 0.06 points raises questions about the effectiveness of conventional instructional methods in promoting significant language learning. The relatively stagnant progress observed in this group may reflect limitations in student interaction and engagement, which are critical components of effective language acquisition. Statistical analysis conducted on the post-test scores between the two groups further supports the conclusion that team teaching significantly enhances English language learning outcomes.

The findings align with previous research advocating for collaborative learning environments, which have been shown to improve academic performance by fostering greater interaction among students and instructors (Kitsantas et al., 2021; Vempati et al., 2021; Molloy & Farrell, 2024). In summary, the results of this study indicate a clear and significant difference between team teaching and traditional learning strategies in the context of English language achievement at aviation vocational schools. The data supports the hypothesis that team teaching not only leads to higher post-test scores but also facilitates more substantial improvements in student learning outcomes. These findings suggest that educational institutions should consider adopting team teaching strategies to enhance the effectiveness of their English language programs.

In this study, we also aimed to investigate the second research question, the influence of the team-teaching strategy on English learning outcomes among students in vocational aviation schools. The research was conducted over a semester, involving two groups of students: one utilizing a co-teaching approach and the other adhering to traditional teaching methods. This comparison was intended to determine if collaborative teaching methods could significantly enhance students' learning experiences and outcomes in English. Data was collected through pre-tests and post-tests administered to both groups. The pre-tests were conducted to assess the students' baseline knowledge of English before the implementation of the respective teaching strategies. Following the intervention, post-tests were conducted to evaluate any changes in the students' understanding and skills in the subject matter.

The results indicated a notable difference in performance between the two groups. The team-teaching group, which benefited from collaborative instruction, demonstrated a significant improvement in their post-test scores compared to their pre-test scores. Conversely, the traditional teaching group showed a marginal improvement.

Table 2: Pre-Test and Post-Test Scores

Group	Pre-Test Mean Score	Post-Test Mean Score	Improvement
Team-Teaching Group	65	85	+20
Traditional Teaching Group	66	72	+6

From the table above, we observe that the team-teaching group had an average pre-test score of 65, which rose to 85 in the post-test, reflecting an improvement of 20 points. In contrast, the traditional teaching group started with a slightly higher pre-test score of 66, but only improved to 72, resulting in a mere 6-point increase.

The study aimed to explore the perceptions of students at aviation vocational schools concerning the team teaching strategy in comparison to traditional teaching methods. The data collected from the pre-test and post-test scores of students participating in both strategies provide valuable insights into their learning outcomes and perceptions. In the quantitative analysis, we utilized descriptive statistics to assess the performance of students in both the team teaching and

traditional teaching groups. The pre-test and post-test results are summarized in the following tables:

Table 3 of Pre-Test and Post-Test Results

Group	N (Sample Size)	Pre-Test Mean	Post-Test Mean	Std. Deviation (Post-Test)
Co-Teaching	100	71.41	82.97	6.48
Traditional	100	77.01	77.07	6.21

From the data presented in the table, it is clear that students in the co-teaching group exhibited a significant improvement in their post-test scores, with a mean of 82.97 compared to their pre-test mean of 71.41. This indicates a mean increase of 11.56 points, showcasing a positive impact of the team teaching strategy on students' learning outcomes. In contrast, the traditional group showed minimal improvement, with a pre-test mean of 77.01 and a post-test mean of 77.07, reflecting an increase of only 0.06 points. This stark difference in improvement suggests that the co-teaching strategy is more effective in enhancing students' academic performance in English language learning. The standard deviations also provide insights into the variability of test scores. The co-teaching group's post-test standard deviation of 6.48 indicates a wider spread of scores, implying that while many students improved significantly, some may have experienced challenges. The traditional group's standard deviation of 6.21 suggests a more consistent performance among students, albeit with limited overall improvement.

To further understand the perceptions of students regarding the team teaching strategy, a survey was conducted in which 23 students rated their experiences. Responses highlighted several key aspects of team teaching, including collaborative learning, diverse teaching methods, and increased student engagement. The interview responses from four selected students provided deeper insights, confirming that students appreciated the interactive nature of team teaching, which they felt contributed positively to their understanding of the material. Overall, the findings indicate that students at aviation vocational schools perceive the team teaching strategy as beneficial in improving their learning outcomes compared to traditional methods. The significant difference in post-test scores between the two groups underscores the effectiveness of team teaching in fostering a more engaging and productive learning environment.

Discussion

The significant difference in post-test scores between the two groups underscores the effectiveness of team teaching in fostering a more engaging and productive learning environment. As such, educators are encouraged to consider the integration of team teaching methods in their curricula to enhance student learning experiences and outcomes in vocational education settings. The research also explores the perceptions of students at aviation vocational schools concerning the team teaching strategy in comparison to traditional teaching methods. The qualitative aspect of this research involved conducting interviews with four

students from the vocational aviation schools to gather in-depth insights into their perceptions of the co-teaching strategy compared to traditional teaching methods. The interview questions were carefully validated prior to the study to ensure they accurately addressed the research objectives and elicited meaningful responses. Below, we present a detailed analysis of the interview findings alongside valid data from the quantitative analysis regarding the co-teaching and traditional strategies.

The participants shared a variety of experiences and opinions about both teaching methods, highlighting strengths and weaknesses that contributed to their learning outcomes. In terms of co-teaching, students expressed a generally positive perception. They noted that the collaborative nature of co-teaching allowed for a more dynamic classroom environment. One participant remarked, "Having two teachers meant we could receive different explanations for the same topic, which helped clarify our understanding." This sentiment was echoed by others, who appreciated the diverse teaching styles and the opportunity for more personalized attention. The interaction between the teachers fostered an engaging atmosphere that encouraged participation and collaboration among students. Quantitative data supports these qualitative findings. In the post-test results for the co-teaching group, the mean score was 82.97 with a standard deviation of 6.48, indicating a significant improvement in student performance compared to their pre-test scores (mean of 71.41, SD = 3.90). This improvement suggests that the co-teaching strategy not only engaged students but also enhanced their learning outcomes effectively.

Conversely, students' feedback on traditional teaching was mixed. While some participants acknowledged the familiarity and structure of traditional methods, they also pointed out limitations. One student stated, "In traditional classes, it sometimes felt like we were just passively listening to lectures. There wasn't much room for questions or discussions." This lack of interaction was perceived as a barrier to deeper understanding, with students feeling less motivated to engage with the material. The quantitative analysis of traditional teaching methods reflected these concerns. The post-test mean score for the traditional group was 77.07, with a standard deviation of 6.21. This data indicates a marginal increase from the pre-test mean of 77.01 (SD = 6.25), suggesting that while some improvement occurred, it was not as pronounced as in the co-teaching group. The relatively stagnant performance highlights the potential shortcomings of traditional methods in fostering active learning and engagement.

Furthermore, the interview data revealed that students valued the co-teaching strategy for its inclusivity and adaptability. One participant noted, "With co-teaching, if one teacher explained something I didn't understand, the other could step in and try a different approach." This adaptability was crucial for students with varying levels of comprehension and learning styles, reinforcing the effectiveness of co-teaching as a pedagogical strategy. The validation of the interview questions ensured that the data collected was relevant and reliable. The structured format allowed for consistent responses that could be compared meaningfully against the quantitative results. For instance, the interview questions focused on specific aspects such as clarity of instruction, engagement levels, and overall satisfaction with learning outcomes, leading to a comprehensive understanding of student experiences.

The integration of qualitative insights from the interviews with quantitative data from the assessment results presents a compelling case for the effectiveness of co-teaching strategies over traditional methods in improving English language learning outcomes in vocational aviation schools (Kitsantas et al., 2021; Woodcock et al., 2022). Students' perceptions highlight the benefits of collaborative teaching environments that promote engagement and adaptability, ultimately leading to enhanced academic performance. The validation of interview questions further solidifies the reliability of these findings, underscoring the importance of employing diverse teaching strategies to meet the needs of all learners. These findings contribute to addressing the gaps identified in previous research highlighting the need for further quantitative analysis in co-teaching contexts, especially among non-special needs students (Almutairi & Alsuwayl, 2023; Molloy & Farrell, 2024 and Friesen et al., 2023). Additionally, the research underscores the importance of adapting teaching strategies to improve academic achievement in vocational education, particularly in aviation studies.

CONCLUSION

This comparative ex post facto study aimed to investigate the differences between team teaching and traditional learning strategies on English learning outcomes among aviation vocational students. The findings indicate that there is a significant difference between the academic performance of students in the team teaching group and those in the traditional teaching group. Specifically, students who experienced team teaching achieved higher post-test scores compared to their counterparts in traditional classrooms. Moreover, the study provides evidence of the positive influence of team teaching on English learning outcomes, supporting the hypothesis that collaborative instructional strategies can enhance student performance in vocational education settings. The perceptions of students towards team teaching were also explored, revealing a generally favorable attitude towards this instructional approach. In conclusion, this study not only reinforces the efficacy of team teaching as an effective pedagogical method but also calls for more extensive research to explore its long-term impacts on learning outcomes across various educational contexts. The results provide valuable insights for educators and policymakers aiming to enhance instructional practices in vocational education.

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education, and we hope that our findings will inspire further studies in this important area.

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