

Case Study: Multimodal Approach as an Alternative for Effective English Learning and Teaching in Polytechnic of Energy and Mineral

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Abstract

The effectiveness of English Learning and Teaching (ELT) is primarily evaluated by students' proficiency in communicating in English, encompassing speaking, listening, reading, and writing skills. At PEM Akamigas, this proficiency is crucial for effective communication within the energy and mineral resources fields. However, classroom observations reveal a lack of student attention and engagement, particularly among Gen-Z students who dominate the institution. Characterized by their digital nativity, Gen-Z students exhibit shorter attention spans and a preference for interactive, multimedia content, which traditional teaching methods fail to address. Therefore, this research explores the implementation of a multimodal approach as a potential solution. By integrating text, audio, visuals, and interactive digital tools such as Kahoot!, virtual reality, and gamification, the approach accommodates the diverse learning styles of Gen-Z students. Additionally, collaborative tools like Google Docs and instant feedback mechanisms promote active participation and engagement. While previous studies have highlighted the benefits of multimodal strategies in general education, this research fills a gap by focusing on their application within technical and energy and mineral resources contexts. It examines how a multimodal approach enhances student attention, engagement, and achievement in ELT at PEM Akamigas, aiming to bridge traditional methods with Gen-Z's digital-first learning preferences. This study seeks to determine whether and how multimodal strategies improve ELT effectiveness in this specialized field.

Keywords: Multimodal Approach; Effective ELT; Students' Attention; Students' Engagement

INTRODUCTION

The effectiveness of English learning and teaching (ELT) is primarily assessed by students' ability to achieve the goal, that is developing proficiency in communicating in English. This proficiency entails mastering the mechanics and grammar of the language while also acquiring the skills to speak, listen, write, and read effectively (Vetriselvi, 2016). These components collectively form the foundation for comprehensive English language competency which enables students to use the language confidently in various contexts.

At PEM Akamigas (Polytechnic of Energy and Mineral Akamigas), the effectiveness of ELT takes on additional dimension. Beyond general communication skills, students are expected to demonstrate the ability to communicate effectively within the specialized fields of energy and mineral resources. This requires not only linguistic proficiency but also the ability to navigate and articulate concepts relevant to their technical disciplines. Therefore, achieving this goal is crucial for their professional readiness and success in a competitive and highly specialized industry (Sudarwati, 2025; Van Leeuwen, 2015; Wang, 2015; Zhang & Li, 2020).

However, concerns have arisen regarding the extent to which students are meeting these expectations. Classroom observations indicate that students frequently lose attention and engagement in ELT activities after a short period. This lack of sustained focus poses a significant challenge to achieving the desired outcomes of ELT. To address this issue, it is essential for teachers to adapt their teaching strategies to create a more engaging and conducive learning environment. One promising solution is the implementation of a multimodal approach, which utilizes various modes of communication and interaction to maintain students' interest and enhance their learning experiences (Roberts et al., 2023; Rohi, 2024; Shamim, 2023; Sinar

Case Study: Multimodal Approach as an Alternative for Effective English Learning and Teaching in Polytechnic of Energy and Mineral & Putri, 2023; Smith, 2020).

Several studies have explored the use of multimodal approaches in ELT. For instance, research by Zhang and Li (2020) demonstrated that integrating digital tools and visual aids significantly improved student engagement and retention in general English courses. Similarly, a study by Chen (2021) highlighted the effectiveness of gamification and interactive media in enhancing the motivation of university students in language learning contexts. However, these studies were conducted in general academic settings and did not address the specific needs of technical or vocational education.

In the context of technical education, a study by Pratama and Sari (2022) examined the use of multimedia in engineering education and found positive outcomes in student comprehension. Nonetheless, their research focused on technical subjects rather than language acquisition. Another relevant study by Roberts et al. (2023) investigated Gen-Z learning preferences in higher education and recommended the use of technology-driven teaching methods. However, their work was broad and did not specifically target ELT in specialized fields such as energy and minerals.

Despite these contributions, there remains a significant gap in the literature regarding the application of multimodal approaches in ELT within technical and vocational institutions, particularly in the energy and mineral sector. No previous study has specifically investigated how a multimodal approach can address the unique challenges of ELT at PEM Akamigas, where students must master both language skills and specialized technical communication.

The research problem lies in the observed gap between the intended goals of ELT at PEM Akamigas and the actual outcomes demonstrated by students. While ELT aims to develop students' proficiency in English, classroom observations reveal a lack of sustained attention and engagement among students during learning activities. This disengagement prevents their ability to achieve the required linguistic and contextual competencies, which are critical for their academic and professional success. The challenge highlights an urgent need to explore alternative teaching strategies – multimodal approach – to foster a more engaging and effective learning environment that aligns with the institution's goals and students' needs.

The primary goal of this research is to examine the effectiveness of implementing a multimodal approach to enhance ELT at PEM Akamigas. This seeks to determine whether the multimodal approach can address the observed lack of students' engagement and attention, thereby improving their linguistic and contextual competencies. Specifically, the research aims to evaluate the impact of this approach on students' ability to communicate effectively within the specialized fields of energy and mineral resources, and to identify how the integration of various modes of communication and interaction fosters a more engaging and conducive learning environment. Through this, the research aspires to contribute to the development of innovative teaching strategies that align with the institution's unique ELT goals and the professional demands of its students.

The novelty of this research lies in its focused application of the multimodal approach in a technical and energy-specific context, addressing both the linguistic and sectoral communication needs of Gen-Z students. It seeks to bridge the gap between traditional ELT methods and the digital, interactive learning preferences of today's students, while also contributing to the under-researched area of English for Specific Purposes (ESP) in the energy and mineral sector.

This research is expected to offer significant benefits both theoretically and practically. Theoretically, it contributes to the body of knowledge in ELT by providing insights into the effectiveness of multimodal approaches in enhancing students' engagement and language proficiency. It highlights how multimodal strategies can be adapted to meet the unique needs of specialized educational institutions like PEM Akamigas. Practically, the findings can serve as a guide for teachers and curriculum developers to design and implement more effective ELT

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strategies, particularly in contexts requiring specialized communication skills, such as the energy and mineral resources fields. By fostering better engagement and improving students' linguistic and contextual competencies, this research ultimately supports the preparation of students for professional success in highly specialized and competitive industries.

RESEARCH METHOD

This research investigated the implementation of multimodal approach as an alternative to improve the ELT effectiveness in PEM Akamigas by applying a mixed-method research design, especially explanatory sequential mixed-method. This design, the combination of quantitative and qualitative methods, was used with the assumption that it provided a better understanding of the research problems than either method alone. It would give clearer and more detailed explanation of the problem to be solved (Creswell & David Creswell, 2018). It began with quantitative data collection which proceeded with qualitative data collection intended to help explain or elaborate the previously obtained quantitative results (Pardede, 2019). The research subjects were 60 students of PEM Akamigas, especially those of Oil and Gas Process Engineering, from whom the quantitative and qualitative data were collected. The quantitative data were collected through the pre-test and post-test, since the language tests can check the learning performance and suggest whether or not the students need more support and allow us to analyse the accuracy among students (Rashid & Sipahi, 2021). Then the qualitative data were collected through the observation and questionnaires. Observation was used since it was a key method of collecting data that enabled the researcher to provide a written photograph of the situation under study (Ameyaw et al., 2018), whereas questionnaires were also used since they heightened the independence and accuracy of responses from the research subjects (Oben, 2021).

This research was conducted by using ELT materials which was in line with Refinery Process Engineering study program and designed in the digital format. Besides, the tools used were only a laptop on the teacher's side, and either laptops or mobile phones on the students' sides.

2. Research Procedure

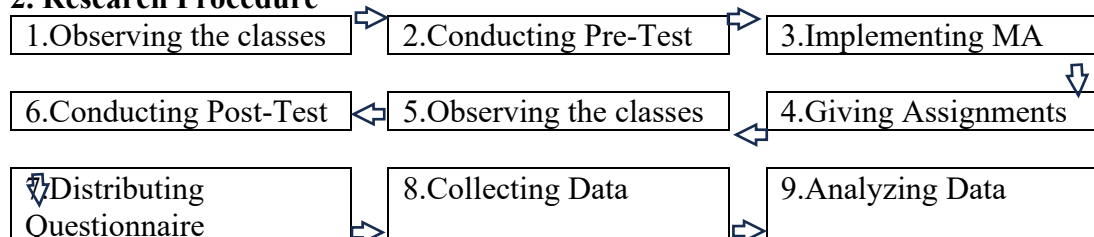


Figure 1. Research Procedure

Source: Processed researcher, 2024

To ensure the systematic execution of this research, the procedure was divided into the following steps:

- (1) Observing the classes: The first step of the research procedure involved systematically monitoring classroom dynamics to evaluate students' levels of attentiveness, responsiveness, and active participation. This stage required the teacher, as the researcher, to attend class sessions and employed structured observation techniques using checklists or field notes that focused on indicators like eye contact, engagement with learning materials, verbal contributions, and interaction with peers, so that the teacher could capture real-time data on students' behaviors.

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- (2) Conducting Pre-Test: A pre-test was administered to evaluate the students' initial proficiency levels and understanding of the material. The test comprised questions designed to align with the learning goal. Results from this stage served as a benchmark to measure the effectiveness of the multimodal approach.
- (3) Implementing the Multimodal Approach: Over a designated period, the multimodal approach was implemented in the classroom. This approach integrated various modes of communication, such as visual, auditory, kinesthetic, and digital tools, to enhance students' engagement and learning. Lesson plans were specifically designed to incorporate these elements, ensuring the alignment with the course objectives.
- (4) Giving assignments: Assignments were distributed to reinforce the concepts introduced during the multimodal sessions. These tasks required students to interact with the material in multiple modes, such as creating presentations, completing collaborative projects, or writing reflective essays. This step aimed to provide a practical application of the learning material.
- (5) Observing the Classes (Post-Implementation): Classroom observations were conducted again during and after the implementation phase to monitor changes in students' attentiveness, responsiveness, and active participation. A comparative analysis of pre- and post-implementation observations helped identify shifts in learning behaviour.
- (6) Conducting Post-Test: Following the implementation period, a post-test was conducted to measure the students' improvement in comprehension and proficiency. The test mirrored the format and objectives of the pre-test to ensure consistency in the assessment process.
- (7) Distributing Questionnaires: Questionnaires were distributed to gather feedback from students regarding their experiences with the multimodal approach. The questions focused on understanding their perspectives on attentiveness, responsiveness, active participation, and overall impact of the methodology.
- (8) Collecting Data: Data from all sources, including observations, test results, and questionnaires were collected systematically. This step involved organizing the data into categories for ease of analysis and ensuring all instruments were accounted for.
- (9) Analyzing Data: The collected data were analyzed using qualitative and quantitative methods. Test scores were statistically examined to determine improvement levels, while questionnaire responses and observation notes were subjected to thematic analysis to uncover patterns and insights. The findings were then synthesized to evaluate the effectiveness of the multimodal approach in enhancing English learning and teaching outcomes.

RESULTS AND DISCUSSION

Results of Pre-Test and Post-Test

A t-test was employed to compare and analyze the difference between pre-test and post-test scores, proving insights into the effectiveness of the implementation of the multimodal approach. This statistical method determined whether the observed changes were statistically significant (Karthikeyan et al., 2018). The detailed breakdown of the findings are as follows:

Table 1. Results of Pre-Test and Post-Test

	Pre-Test Score	Post-Test Score
Mean	55.26666667	67.8
Variance	129.8259887	158.3322034
Observations	60	60
Pearson Correlation	0.995416759	
Hypothesized Mean Difference	0	
df	59	

	Pre-Test Score	Post-Test Score
t Stat	58.78211633	-
P(T<=t) one-tail	2.26439E-54	
t Critical one-tail	1.671093032	
P(T<=t) two-tail	4.52879E-54	
t Critical two-tail	2.000995378	

Sumber: Data diolah peneliti, 2024

(1) t-statistic: -58.78

The t-statistic measured the size of the difference between the two groups (Pre-Test and Post-Test) in terms of the variation within the scores. A negative t-statistic indicated that the Post-Test scores were, on average, higher than the Pre-Test scores. A large negative t-statistic (in this case, -58.78) suggested a substantial improvement in performance after the implementation of multimodal approach, i.e. the students' performance in the Post Test is significantly higher than in the Pre-Test. The absolute value of 58.78 indicated that the difference in means of Post-Test and Pre-Test was much larger than what could be expected by coincidence. This strong difference in performance showed that the implementation of multimodal approach, reflected in the test scores, had a large impact on the students.

(2) p-value: 4.53e-54

The p-value represented the probability of getting a result this significant if the null hypothesis were true. The null hypothesis typically assumed there was no difference between the Pre-Test and Post-Test scores (i.e. no improvement). A p-value of 4.53e-54 was incredibly small, far less than the typical significance level of 0.05. Since the p-value was so small, it indicated strong proof against the null hypothesis. Therefore, the null hypothesis was rejected and it could be concluded that the difference between the Pre-Test and Post-Test scores was statistically significant. In practical terms, this meant there was a high probability that the improvement in students' performance from the Pre-Test to the Post-Test was not due to coincidence, but rather the result of the implementation of the multimodal approach.

Given the t-statistic of -58.78 and the very low p-value of 4.53e-54, it can be concluded that there was a statistically significant improvement in the students' performance between the Pre-Test and Post-Test. The improvement is unlikely to have happened by chance, which suggested that the multimodal approach implemented between the Pre-Test and Post-Test had a powerful, positive effect on the students' learning outcome.

Results of Assignments

Results of Listening Assignments

The analysis of the students' scores in the three listening assignments revealed a consistent improvement trend. On the average, the scores increased from 46.08 in Assignment 1 to 54.13 in Assignment 2 and further to 61.37 in Assignment 3. The data showed that most students demonstrated positive progress, with significant gains observed in the transition from Assignment 1 to Assignment 3. This overall upward trend suggested that the students were able to enhance their listening skills as time went on, likely as the result of effective instruction and consistent practice.

Between Assignment 1 and Assignment 2, the average improvement was 8.05 points, which reflected a strong initial response process. This phase of improvement likely indicated that the students were adapting to the listening assignments. The standard deviation remained stable, suggesting that the progress was fairly uniform across the group. However, a small number of students showed limited or no improvement, which might point to individual challenges that need to be addressed. From Assignment 2 to Assignment 3, the average improvement was 7.23 points, slightly lower than in the earlier phase. While most students

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continued to improve, the increased variability in scores, as indicated by the higher standard deviation, suggested that individual performance began to diverge. Some students showed significant gains, reaching scores as high as 71, while others experienced stagnation or even a slight decline.

The overall improvement from Assignment 1 to Assignment 3 was 15.28 points on average, emphasizing the cumulative effect of the listening practice and instruction. The range of scores also widened, with a noticeable increase in both minimum and maximum values, which indicated that while some students excelled remarkably, others might require additional support to catch up. These findings highlighted the importance of the implementation of multimodal approach to help struggling students while maintaining the pace for high achievers. This analysis underlined the success of the multimodal approach in improving listening skills.

Results of Speaking Assignments

The analysis of students' scores across the three speaking assignments revealed a consistent improvement trend overall. The mean scores showed gradual gains from Assignment 1 to Assignment 3. In Assignment 1, the average score was 47.9, increasing to 52.3 in Assignment 2, and further rising to 58.1 in Assignment 3. This trend reflected steady progress in students' speaking abilities, with most students showing gradual improvements over the three assignments. The overall increase in scores suggested that students were able to adapt and improve their speaking skills as the assignments progressed.

From Assignment 1 to Assignment 2, the average improvement was 4.4 points, which showed a moderate gain in performance. This increase indicated that students were able to incorporate feedback and refine their speaking abilities, likely benefiting from more practice or improved understanding of the assignment expectations. The range of scores in Assignment 2 also reflected more consistent performance, with most students making noticeable progress. However, a small number of students still showed limited improvement, which suggested certain students might need more targeted support to fully develop their speaking skills. The improvement between Assignment 2 and Assignment 3 was slightly higher, with an average increase of 5.8 points. This more significant achievement might indicate that students were becoming more confident and skilled as they approached the final assessment. The larger improvement could also be attributed to students applying what they learned previous in previous assignments to perform better in Assignment 3. However, there were still some students who showed minimal progress, indicating that individual differences in learning styles and challenges could be affecting their growth in speaking proficiency.

Overall, the total improvement from Assignment 1 to Assignment 3 was 10.2 points on average, which showed a clear upward trend in speaking performance. This suggested that the students' speaking skills improved over time, although some students experienced challenges and showed less significant progress. The higher maximum scores in Assignment 3 (reaching up to 70) highlighted the success of some students in mastering the speaking tasks, while others remained at a more modest level. These findings indicated that while most students benefited from the assignments there was a need for the implementation of the multimodal approach to support those who were still struggling to reach higher proficiency levels.

Results of Reading Assignments

Based on the detailed analysis of the students' scores across three assignments, there was a clear upward trend in performance. The average score for Assignment 1 stood at 67.58, which was increased to 69.95 in Assignment 2, and further improved to 71.47 in Assignment 3. This progress illustrated a consistent enhancement in students' academic achievement over the course of these assessments. The overall average score, calculated across all students and assignments, was 69.67. This relatively steady performance indicated that the majority of students were achieving at a comparable level, which reflected a balanced distribution of skills within the group. Such consistent averages suggested that the students were collectively

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benefitting from the learning process, whether through the teaching method employed or their own dedication to improvement.

When examining the specific progress made by students, the data revealed an average improvement of 3.88 points from Assignment 1 to Assignment 3. This positive trend underlined the gradual strengthening of students' reading abilities and comprehension over time. The steady rise in scores might be attributed to several factors, including the students' commitment to mastering the material, the teachers' effective instructional strategies, or a combination of both. Continuous reinforcement of reading skills through assignment and feedback could also play a significant role in fostering this development. The progress was evidence to the dynamic learning environment, where students were not only absorbing knowledge but also applying it more effectively as they advanced through the curriculum.

Despite the encouraging overall trend, the data also pointed to certain differences among individual students. While most demonstrated measurable growth in their scores, a smaller group showed limited or insignificant progress, indicating potential challenges in their learning process. These students might require more personalized support, such as tailored assignments, additional tutoring, or targeted interventions, to address their specific needs. By focusing on these areas of concern, teachers could help bridge the gaps in performance and ensure that all students had an opportunity to succeed. Overall, the analysis highlighted significant progress while emphasizing the importance of a supportive and comprehensive educational framework to maintain and enhance the positive development.

Results of Writing Assignments

Based on the analysis of the students' writing assignment scores across three assignments, a clear pattern of improvement was evident. The average score for Assignment 1 was 68.38, reflecting the baseline level of performance among the students at the beginning of the assessment period. In Assignment 2, the average score increased slightly to 70.35, showing a measurable improvement in their writing skills and understanding. By the time students completed Assignment 3, the average score had risen further to 71.75. This steady improvement suggested students were actively building on their previous efforts and benefiting from the feedback, instruction, or practice provided throughout the assignments. Such a pattern indicated a positive trend of academic growth, which was a key indicator of effective learning and teaching practices.

The overall average score across all three assignments, calculated to be 70.16, highlighted a relatively consistent level of achievement within the group. While there were individual differences, most students performed within a similar range, pointing to a cohesive level of understanding and skill development among the group. This overall consistency also reflected the balanced and supportive learning environment, where the majority of students were able to achieve progress. When examining the improvement in detail, the data revealed an average gain of 3.37 points from Assignment 1 to Assignment 3. Although this change might seem modest, it represented a meaningful upward trend in students' writing proficiency over time. This improvement was likely the various factors, such as regular practice, effective teaching strategies, and increased students' engagement or motivation. The continuous rise in scores underlined the importance of providing a structured and encouraging environment that fosters ongoing learning.

However, the data also showed variations in individual progress. While most students displayed noticeable growth, a subset of the group exhibited minimal improvement. This disparity suggested that some students might require additional support or tailored interventions to overcome specific challenges they faced. Addressing these individual needs could further enhance the overall effectiveness of the learning process. Overall, the analysis provided an optimistic view of students' progress while highlighting areas for continued focus to ensure all

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learners achieve their potential in writing skill development.

Results of Observation

Students' attentiveness (Mustafizur Rahman et al., 2024), responsiveness (Williamson, 2022), and active participation (Khan et al., 2017) are crucial factors determining the effectiveness of classroom instruction and overall academic success. Attentiveness refers to the degree of focus a student maintains during lessons, responsiveness measures their ability to engage in two-way communication and react to stimuli, while active participation reflects their involvement in classroom activities. Each parameter was measured on a scale from 1 to 10, with lower numbers indicating poor performance while higher numbers showing better performance.

(1) The 1st Observation:

In the first observation, the average percentages for the students' attentiveness, responsiveness, and frequency of active participation were as follows:

- Attentiveness: 43.0%
- Responsiveness: 38.0%
- Active Participation: 41.83%

The attentiveness data revealed a range of scores between 2 and 7, with most students scoring between 3 and 6. The average percentage of attentiveness scores among 60 students was 43.0%. Responsiveness scores among the students ranged from 1 to 7, with an average of 38.0%. Then, the frequency of active participation showed scores spanning from 1 to 8 with an average score of 4.2.

(2) The 2nd Observation:

In the second observation, the average percentages for students' attentiveness, responsiveness, and frequency of active participation are as follows:

- Attentiveness: 63.0%
- Responsiveness: 53.0%
- Active Participation: 61.83%

The attentiveness data revealed a range of scores between 2 and 7, with most students scoring between 4 to 9. The average percentage of attentiveness scores was 63.0%. Responsiveness scores showed a slightly broader range, from a minimum of 3 to a maximum of 9, with an average of 53.0%. Then, active participation exhibited the greatest variability, with scores ranging from 3 to a maximum of 10.

The first and second observations highlighted notable differences in students' attentiveness, responsiveness, and active participation. In the first observation, the percentages of attentiveness (43.0%), responsiveness (38.0%), and active participation (41.83%) reflected moderate levels of engagement, with attentiveness being the highest. In contrast, the second observation demonstrated a significant improvement across all the three parameters: attentiveness increased to 63.0%, responsiveness to 53.0%, and active participation to 61.83%.

When comparing the ranges of scores, the second observation showed broader engagement across the students. In the first observation, attentiveness ranged from 2 to 7, while in the second observation, it extended to a range of 4 to 9, suggesting an improvement in the lower-performing students. Similarly, responsiveness scores in the first observation ranged from 1 to 7 but shifted upwards in the second observation, with scores ranging from 3 to 9. Active participation, which initially spanned from 1 to 8, increased to a range of 3 to 10 in the second observation, showing greater variability and participation among the students.

The observed improvement from the first to the second observation indicated an overall enhancement in students' engagement and activity levels. The rise in average percentages – particularly the 20% increase in attentiveness and 23% increase in active participation – suggested that the implementation of multimodal approach might have positively influenced students' behavior. Furthermore, the shift in score distributions, especially the increase in minimum scores for responsiveness and active participation, signified that previously less-

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engaged students became more involved. Overall, the second observation reflected a more active, responsive, and attentive classroom dynamic.

Results of Questionnaires

The data collected through questionnaires were analyzed using Likert-Scale since it was an easy and reliable scaling technique with which it was easy to measure and understand research subjects' perceptions (Mumu et al., 2022). There were five categories of the scale used to analyze the data of the students' attentiveness, students' responsiveness, and students' active participation; that is strongly agree (with the score 5), agree (with the score 4), neutral (with the score 3), disagree (with the score 2), and strongly disagree (with the score 1).

Students' Attentiveness

Ten variables of students' attentiveness were analyzed before and after the implementation of multimodal approach, namely:

A1: I pay close attention to the teacher during lessons.

A2: I actively listen to class discussions without getting distracted.

A3: I find it easy to stay focused during lectures.

A4: I regularly take notes to help me remember what is taught.

A5: I stayed engaged when the teacher explains difficult concepts.

A6: I avoid using my phone or other devices during class.

A7: I ask questions when I do not understand something.

A8: I make an effort to follow along with class activities.

A9: I am able to stay focused for the full duration of a lesson.

A10: I feel that my attention during lessons helps me perform better in tests.

And the result of the analysis was shown in Figure 2, as follows:

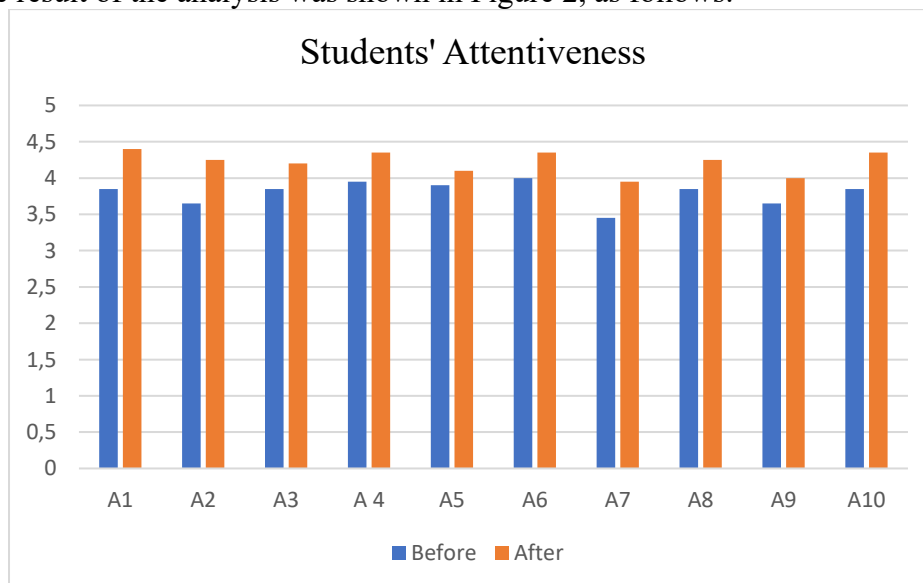


Figure 2. Students' Attentiveness

Source: Questionnaire data processed by researchers, 2024

The data reflected the impact of implementing a multimodal approach on students' attentiveness and engagement during lessons. Before the approach was applied, students reported moderate engagement levels across all variables, with average scores ranging from 3.45 to 4.0 on a Likert scale. The highest score before the implementation of multimodal approach, 4.0, was in avoiding distractions like using phones, suggesting that students already demonstrated some discipline in minimizing distractions. However, areas such as actively asking questions (3.45) and maintaining focus throughout the lesson (3.65) revealed room for

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improvement in fostering active participation and sustained attention.

After the implementation of the multimodal approach, the data indicated noticeable improvement across all variables. The most significant increases were observed in students' ability to actively listen to discussions (from 3.65 to 4.25) and following class activities (from 3.85 to 4.25), suggesting the new teaching strategy effectively enhanced engagement. Additionally, asking questions showed an improvement from 3.45 to 3.95, reflecting a positive shift in students' confidence or willingness to participate. Even variables that initially scored higher, such as avoiding distractions and note taking, experienced growth, reaching 4.35 after the implementation of multimodal approach.

Overall, the findings highlighted the success of the multimodal approach in boosting attention, participation, and focus during lessons. The consistent improvements suggested that this approach not only addressed students' challenges but also reinforced behavior that contribute to better academic performance. With scores rising across all variables, the implementation of multimodal approach demonstrated its potential as a transformative strategy for fostering deeper learning and sustained concentration in educational settings.

Students' Responsiveness:

In terms of responsiveness, there were also ten variables analyzed, as follows:

B1: I response promptly when the teacher asks a question.

B2: I actively participate in class discussions.

B3: I contribute ideas when asked by the teacher.

B4: I engage in class activities without being prompted.

B5: I answer questions even if I'm unsure.

B6: I volunteer to answer questions when I understand the material.

B7: I ask questions when I do not understand something.

B8: I contribute to group work and collaborative tasks.

B9: I seek clarification when I don't understand the material.

B10: I response to feedback from the teacher to improve my work.

And the result of the analysis of students' responsiveness was shown in Picture 4.1.4.1.2, as follows:

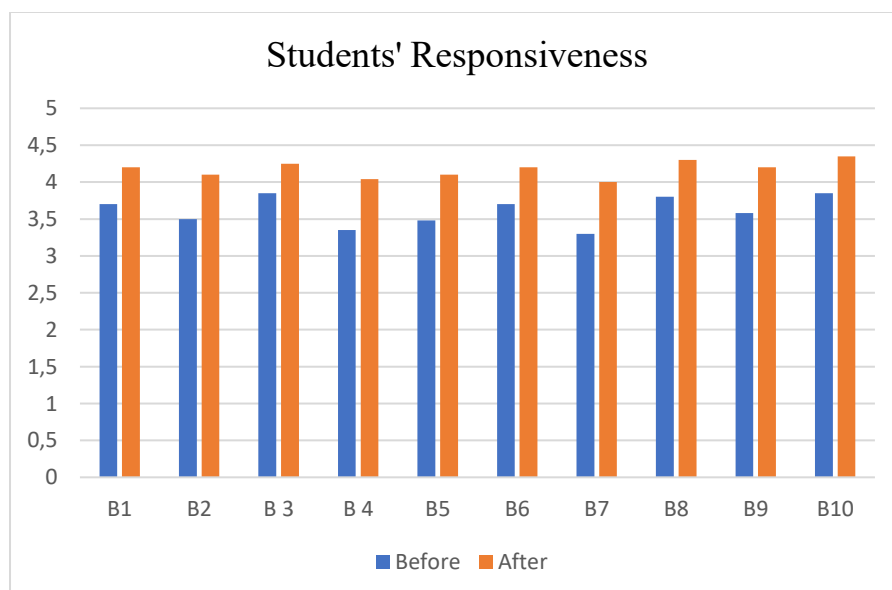


Figure 3. Students' Responsiveness

Source: Questionnaire data processed by researchers, 2024

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The data highlighted the improvement in students' responsiveness before and after the implementation of multimodal approach in the classroom. Initially, the average scores before the implementation ranged from 3.3 to 3.85, which indicated moderate levels of responsiveness. Students showed the highest responsiveness in contributing idea when asked (3.85) and responding to teacher's feedback (3.85), suggesting they were somewhat comfortable with guided participation. However, lower scores in engaging in class activities without prompting (3.35) and asking questions when unsure (3.3) pointed to hesitancy in independent participation and proactive learning.

After the multimodal approach was implemented, there was a significant improvement across all variables, with average scores rising to a range of 4.0 to 4.35. Notable increases were observed in areas like engaging in class activities without prompting (from 3.35 to 4.05) and answering questions even when unsure (from 3.48 to 4.1), which reflected enhanced confidence and self-motivation among students. The most substantial growth was in responding to teacher's feedback, which rose to 4.35, underlining the effectiveness of the multimodal approach in fostering a more active and responsive learning environment.

Overall, the data underscored the positive impact of the multimodal approach in transforming classroom dynamics. The consistent improvement across all variables suggested that this approach not only enhanced students' engagement but also encouraged their willingness to participate, sought clarification, and acted on feedback. By addressing both confidence and responsiveness, the multimodal approach proved to be a valuable tool in fostering a more interactive and collaborative learning atmosphere.

Students' Active Participation:

The students' active participation was also analyzed based on ten variables; namely:

- C1: I frequently participate in class discussions.
- C2: I actively ask questions during lessons.
- C3: I volunteer to answer questions in class.
- C4: I contribute ideas during group work.
- C5: I regularly share my thoughts in class activities.
- C6: I engage in class debates or discussions.
- C7: I often ask for clarification when I do not understand something.
- C8: I participate in collaborative group projects.
- C9: I respond regularly to the teacher's questions.
- C10: I share my ideas with classmates during activities.

And the result of the analysis of students' active participation was shown in Picture 4.1.4.1.3 as follows:

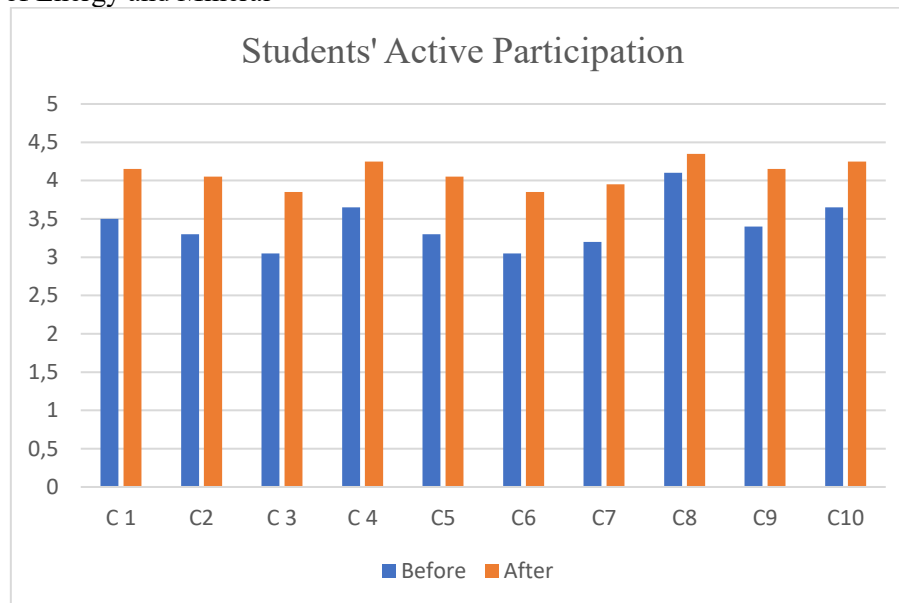


Figure 4. Students' Active Participation

Source: Questionnaire data processed by researchers, 2024

The data demonstrated a significant improvement in students' active participation before and after the implementation of multimodal approach in the classroom. Before the implementation, the average scores ranged from 3.05 to 4.1, with the highest score in following along with class activities (4.1), which suggested that students were somewhat attentive to the flow of lessons. However, areas such as contributing ideas (3.5) and volunteering to answer questions (3.05) were relatively low, which highlighted a lack of confidence or willingness to engage in more confident form of participation.

Following the implementation of the multimodal approach, there was an increase across all variables, with post-implementation scores ranging from 3.8 to 4.35. Notable improvements were observed in engaging in class activities without prompting (from 3.65 to 4.25) and responding promptly to teacher's questions (from 3.5 to 4.15), which indicated that students became more proactive and responsive during lessons. The scores for seeking clarification (from 3.4 to 4.15) and responding to feedback (from 3.65 to 4.35) also reflected a strengthened commitment to understanding and improving their performance.

Overall, the findings suggested that the multimodal approach was effective in fostering a more interactive and participatory learning environment. The increased scores across all aspects of active participation indicated that students became more engaged, confident, and proactive in their learning. This highlighted the potential of the multimodal approach as a teaching strategy that not only enhanced students' engagement, but also cultivated a deeper sense of involvement in classroom activities (Al-Muttairi, 2025; Daulay, 2025; Deshmukh, 2025; Dineshika, 2024; Hamid, 2025).

CONCLUSION

The research effectively addressed its questions by demonstrating that the multimodal approach significantly improved the effectiveness of English Learning and Teaching (ELT) at PEM Akamigas. The combination of pre-test and post-test results, supported by data from listening, speaking, reading, and writing assignments, revealed marked improvements in students' performance, with statistical evidence confirming the approach's impact on learning outcomes. Observational data further showed enhanced attentiveness, responsiveness, and participation, reflecting a positive shift in classroom dynamics that fostered confidence,

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collaboration, and self-directed learning. The integration of diverse teaching methods under the multimodal approach proved instrumental in addressing varied learning preferences and promoting active engagement. To extend this study, future research could explore the long-term effects of the multimodal approach on language retention, its applicability in other technical institutions, and the role of emerging digital tools in sustaining student motivation and achievement over time.

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