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EFL Engineering Teachers' and Students' Attitudes Towards Utilizing Pictures in Teaching and Learning Technical Vocabulary

Ibtihal Salman Dawood Al Garaghoolee

Zawia University, College of Engineering, General Courses Department, Zawia, Libya

A B S T R A C T

This research paper investigates the EFL (English as a Foreign language) Engineering teachers' and students' attitudes toward utilizing pictures in teaching and learning technical vocabulary. For so doing, forty-four 2nd semester students of the General Courses Department and five instructors have experience teaching technical vocabulary across various colleges. Most engineering teachers and students face difficulty adopting the most effective and rapid techniques for teaching and learning English technical vocabulary. Therefore, they resort to employing pictures as a teaching and learning aid. This study aims to investigate the views of teachers and students concerning the use of pictures in teaching and learning technical vocabulary to determine their effective and rapid role. To achieve the purpose of the study, two main research instruments were employed in the study. A questionnaire for students and an interview for teachers. The findings of the study indicated a strong preference for and positive perception of using pictures in learning and teaching technical vocabulary. As it enhances recalling, and makes the class more engaging.

Keywords: Technical Vocabulary, Visual Aids, Pictures, Retention, Engagement.

1. Introduction

Mastering an engineering career requires logical thinking, scientific knowledge, and mathematical skills. Moreover, there is a vital role that shouldn't be neglected, which is the requisite for technical vocabulary. Throughout their studies, students encounter a wide variety of technical vocabulary. English as a Foreign Language engineering teachers must employ the most suitable and effective techniques to help students understand and remember these technical terms. It is worth mentioning that one of the most appropriate and effective strategies that can be employed in learning is using pictures. This strategy was central to the 'direct method'. In this regard, this method emerged as a reaction to the grammar-translation method, which focuses on translation as a tool in foreign language learning and teaching. One of the main concerns of the direct method is that teachers clarify new vocabulary by using visual aids, namely pictures. Drawing from my 12 years of observation and experience in teaching English technical vocabulary to engineering students, it is observable that EFL students learn technical vocabulary more quickly and effectively when they connect with pictures. Therefore, this study attempts to figure out the perspectives of both the teacher and learner towards utilizing pictures in learning and teaching technical vocabulary. Consequently, the results of this study will provide valuable insights for both educators and students, highlighting the essential role that pictures play in the process of teaching and learning technical vocabulary.

2. Statement of the problem

The majority of engineering teachers and students face difficulty in adopting the most effective and rapid techniques for teaching and learning technical English vocabulary. Consequently, in the General Department of the 2nd semester in the Engineering College of Zawia University, they resort to using pictures as a teaching and learning aid.

3. Research Questions

This study intends to answer the following questions:

1. How do teachers and students perceive the use of pictures in teaching and learning technical vocabulary?

2. To what extent do pictures facilitate rapid and effective learning of technical vocabulary for students?

4. Aims and objectives

The purpose of this study is to investigate engineering teachers' and students' views on using visual aids, particularly pictures, in teaching and learning technical vocabulary. Additionally, it aims to determine whether pictures help students learn technical vocabulary more quickly and effectively.

5. Scope and Limitations

In this study, the limitations are divided into two parts. The theoretical part focuses solely on one type of visual aid, namely pictures. The practical part is limited to investigating EFL engineering teachers' and students' views regarding the use of pictures in teaching and learning technical vocabulary for the 2nd semester in the General Courses Department at Zawia Engineering College.

6. Significance of the study

The study of EFL teachers' and learners' opinions on using pictures as a visual aid in teaching and learning technical vocabulary is an important area worth investigating for both teachers and students in the General Department of the Engineering College. The results will help teachers understand EFL students' views on using pictures for learning technical English vocabulary. Moreover, teachers will gain insight into whether pictures can assist students in learning English technical vocabulary more quickly and effectively.

7. Literature Review

The use of visual aids, particularly pictures, in English as a Foreign Language (EFL) instruction has gained attention, especially in technical fields like engineering. As the need for proficient technical vocabulary grows, understanding the role of visual aids in enhancing learning outcomes is essential. This literature review examines EFL engineering teachers' and students' attitudes toward using pictures in teaching and learning technical vocabulary. It summarizes research on the effectiveness of visual aids in vocabulary acquisition and educators' and learners' perspectives. By exploring these viewpoints, the review emphasizes the need for teaching strategies that incorporate visual elements to create a more effective and engaging learning environment for engineering students.

7.1 Technical vocabulary

Technical vocabulary plays a crucial role in learners' success, particularly in the engineering field. Harmer (2001, p. 246) pointed out that language structures make up the skeleton of language, then it is vocabulary that provides the vital organs and flesh. Therefore, EFL engineering students need a significant amount of specialized technical vocabulary to meet their professional requirements. This highlights the necessity for precise definitions of technical vocabulary. Nation and Chung (2004) clarify three criteria for technical vocabulary: (a) it pertains to a subject knowledge system; (b) it relates to a specific subject; and (c) it arises in a specialized career. Similarly, Lie and Liu (2019) identified technical vocabulary as "subject-bound," referring to words used in a specific subject to communicate subject-specific knowledge. The technical vocabulary course for 2nd-semester students aligns with Lie and Liu's (2019) definition, as it enables them to acquire a substantial number of technical terms.

7.2 Significance of visual aids in Language Teaching

The use of L1 to illustrate the meaning is not enough. According to Nonkukhetkhoug et al. (2012), one of the primary significant factors in students' progress in learning technical English is their vocabulary learning strategy. Therefore, Visual aids are among the most valuable teaching and learning strategies that can enhance the process of acquiring technical vocabulary. Dash and Dash (2007) define visual aids as "added devices or supplementary materials that help the teacher make his presentation concrete, effective, interesting, meaningful, and aspirational" (p. 123). Visual aids are classified into non-projected aids and projected aids, which include films, slides, and overhead projectors, as well as pictures and charts. In this research, pictures, which are the primary focus, are classified as non-projected aids.

One of the most effective visual aids is pictures, which are considered a type of "media" (Donal, 2012). Al-Khresheh (2020) defines pictures as illustrations that are transformed into images. In his study, Sun (2015) asserts the importance of authentic materials in English as a second language teaching and learning, and the results of her study approved the positive effects of pictures on learning as a positive attitude. In the same context, Nuzulimah (2016) and Khafidhoh (2019) studied whether visual aids enhance English vocabulary in Indonesian primary and elementary schools. Both of them conclude that student's vocabulary achievement has improved when visual aids, namely pictures, are incorporated.

7.3 Theories supporting the use of visual aids in education

The employment of visual aids in education has a major impact in education. Accordingly, two theories regarding the use of visual aids, namely pictures, in the learning process were developed.

The first theory is Paivio's (1971-1976) dual coding theory. This theory emphasizes learning through the use of pictures and words. Otherwise, it neglects the depending on just words in learning. Consequently, this is attributed to the effect that mental image has over depending on just words. (Olson&Carpenter,2011) The main principle of dual coding theory is that visual aids can assist in converting complex verbal processes into comprehensible visual/verbal words. (Richard & Rolati ,2012). Therefore, it has had a central impact on education. In this respect, the field of engineering includes a wide variety of technical vocabularies. Visual aids, solely pictures are worthwhile as they can convey complex terminology at a glance.

The second theory is Multimedia Media Learning Theory. The proof of how people learn from multimedia instructional messages is the cognitive theory of multimedia learning. Multimedia instructional message is defined as educational material such as pictures, printed text, video, etc that aims to reinforce new knowledge in a learner, (Mayer,2024). According to him, multimedia instructional words get into the learner's mind through auditory and visual instructional learning. The combining of the former and the latter can result in meaningful knowledge that recalled in long-term memory.

7.4 Effectiveness of Pictures in Vocabulary Teaching

Mansourzadeh (2014) conducted a study comparing the teaching of vocabulary through pictures versus audio-visual aids to young Iranian EFL learners to determine if one method was more effective than the other. Sixty EFL learners were divided into two groups, and a pretest was administered. The first group was taught using pictures, while the second group was taught using audio-visual aids. After ten sessions of instruction, both groups took a post-test. The results showed that teaching vocabulary using pictures was more effective than using audio-visual aids. Hill (1990, as cited in Trang, 2022) supported the teaching-learning process in the classroom with the use of pictures. Trang (2022) also regarded pictures as a valuable means of teaching. Hill (1990) listed several advantages of using pictures in teaching, including "availability, cheapness, flexibility, and variety." These advantages make pictures one of the most effective techniques for teaching vocabulary.

7.5 Advantages of Using Pictures

Numerous studies have confirmed the positive factors such as motivation and interest in utilizing pictures in the teaching-learning process. For example, Gerlach & Ely (1980) confirmed that pictures can stimulate the student's motivation and engagement. The students will participate actively when they are motivated throughout the teaching-learning process.

Moreover, Susanto (2017) stated that visual techniques, such as pictures, help learners remember vocabulary better, as memory for pictures is more reliable. Furthermore, Joklav (2009) added that pictures assist teachers in making the curriculum more beneficial and engaging. Otherwise, a significant amount of time is often needed for teachers to explain what technical terms refer to. In this respect, Harmer (as cited in Mamonto et al., 2019) provided three advantages of using pictures: pictures can help teachers shorten lesson preparation time; also, pictures covered with a thin protective layer of plastic can be reused frequently; finally, pictures can be used at various levels in the classroom, benefiting children, adults, and those taking general or business courses. The integration of pictures in teaching technical vocabulary offers numerous advantages that enhance both teaching and learning experiences.

Despite the plethora of studies on the incorporation of visual aids in EFL teaching and learning, there is a dearth of research on the use of pictures in the teaching and learning of EFL engineering technical vocabulary. Therefore, this study aims to address the gap by investigating engineering teachers' and students' views on using visual aids, particularly pictures, in teaching and learning technical vocabulary.

7.6 Common Challenges faced by teachers and students when using pictures

Visual aids, in particular, pictures have become increasingly common in engineering education. Despite, the enormous advantages of incorporating pictures in the classroom, students and teachers still face challenges. These include: Firstly, the lack of clarity of pictures that are used by teachers. Nevertheless, teachers should be aware of selecting clear images. Moreover, they need to provide detailed explanations with pictures. Felder & Brent (2005) emphasize the requirement for developing high-quality, subject-specific visual aids. Secondly, teachers are not aware of their effectiveness and importance in teaching and learning or they never use them. (Azma (2017) even though, they confirm their significant role in learning effectively. Thirdly, Pictures can take time to adapt meetly for a particular activity (Joklova,2009). Finally, it could be challenging to illustrate abstract words (Mansourzaheh,2014), In this respect, Mayer (2009) argues that visuals can enhance learning by helping students process information more efficiently.

8. Methodology

8.1 Research Design

This study employs a mixed-methods research design that combines qualitative and quantitative approaches. This design enables a comprehensive investigation of the topic and provides deeper insights into the perceptions of engineering teachers and learners regarding the use of pictures for teaching and learning technical vocabulary. In this respect, Kabir (2016) confirms that data carried out by incorporating both qualitative and quantitative methods can take advantage of strengths and decrease shortcomings. Moreover, it provides reliable and valid data for the study. Therefore, this study aims to capture a well-rounded understanding of the effectiveness and impact of visual aids in the educational process.

8.2 Participants

The sample of this study consists of five engineering teachers and forty-four learners from Zawia Engineering College. The students were ***enrolled in the 2nd semester of the General Courses Department. Data was collected during the spring term of 2023. The participated teachers have experience in teaching technical vocabulary across various colleges. They were interviewed to gather insights into their attitudes toward using pictures in teaching technical vocabulary.***

8.3 Data collection methods

The data collection process involved two main research instruments: a questionnaire and an interview.

8.3.1 The questionnaire

The questionnaire is administered to a large sample of students and consists of eight items. They were closed-ended questions. The items of the questionnaire were adopted from Schkleef (2019). It was used in this current study to collect data on the participants' attitudes toward employing pictures in learning technical vocabulary. Kabir (2016) assets the collection of data by using a questionnaire since data can be collected from a large number of participants without wasting time and expense.

The answer scale is based on a 4/3/2 point Likert scale, with the following options: (a) Always, (b) Sometimes, (c) Rarely, (d) Never. Additionally, responses can be categorized as (a) Positive, (b) Neutral, (c) Negative, and (a) Yes, (b) No. This scale was used to figure out students' attitudes toward employing pictures in learning technical vocabulary. Nemoto & Beglar (2014) stated that the Likert-scale questionnaire as the most commonly used instrument for efficiently and easily measuring enormous reliable data. This questionnaire is designed to collect quantitative data, which can be statistically analyzed.

8.3.2 The interview

An in-depth interview is conducted with a selected number of teachers to gather detailed insights and perspectives regarding the use of pictures as a visual aid. Cresswell (2009) states that interview questions can reduce the gap between the researcher and participants. Moreover, Kabir (2016) adds that the stimulation of specific answers to focused interview questions can be worthwhile, and more reliable qualitative data can be obtained. The interview of this study consists of 8 open-ended questions and aims to collect data from five English language teachers, all of whom are university instructors. This qualitative data supplements the quantitative findings from the students' questionnaire.

9. Data analysis

The collected data was analyzed using both quantitative and qualitative data analysis techniques. The questionnaire data was analyzed statistically, while the qualitative data, gathered from interviews, was analyzed through thematic analysis. Together, these methods allowed for a comprehensive examination of the research questions, combining the strengths of both numerical data and personal narratives.

10. Results

10.1 Questionnaire results

Question	Response Options	Frequency	Percentage
1. How often does your teacher use pictures in the classroom?	a) Always	3	7.14%
	b) Sometimes	27	64.29%
	c) Rarely	10	23.81%
	d) Never	4	9.52%
2. What is your attitude towards using pictures as a teaching aid in learning technical vocabulary?	a) Positive	35	83.33%
	b) Neutral	7	16.67%
	c) Negative	2	4.76%
3. Does using pictures enable you to recall the meaning of technical words during exercises or exams?	a) Yes	36	81.82%
	b) No	8	18.18%

4. Does the class become more interesting if the teacher uses pictures when teaching technical vocabulary?	a) Yes	38	86.36%
	b) No	6	13.64%
5. Do you think that pictures facilitate your learning of technical vocabulary?	a) Yes	32	72.73%
	b) No	12	27.27%
6. Does using pictures in teaching you technical vocabulary decrease your fear of making mistakes when doing exercises?	a) Yes	25	56.82%
	b) No	19	43.18%
7. Does using pictures in teaching you technical vocabulary motivate and encourage you to use these vocabulary items?	a) Yes	29	65.91%
	b) No	15	34.09%
8. Has using pictures for teaching vocabulary that you learned during your past study year had a long-term effect?	a) Yes	26	59.09%
	b) No	18	40.91%

Table 1: Results of the questionnaire

1. Frequency of Picture Use: The majority of students (64.29%) reported that their teachers sometimes use pictures in the classroom, while a smaller percentage indicated that pictures are always used (7.14%). However, 23.81% of students noted that pictures are rarely used, and 9.52% said they are never used. This suggests that while pictures are utilized, there is significant variation in their frequency of use, indicating room for more consistent integration of visual aids.

2. Student Attitude Towards Pictures: A significant proportion of students (83.33%) expressed a positive attitude towards using pictures as a teaching aid, with only a small percentage (4.76%) holding a negative view. This demonstrates a clear preference among students for the use of pictures, indicating that visual aids are generally well-received as a method of instruction.

3. Effectiveness of Pictures in Recall: Most students (81.82%) agreed that using pictures helps them recall the meaning of technical words during exercises or exams, reinforcing the idea that visual aids play an important role in enhancing memory retention. However, 18.18% of students felt that pictures did not aid in recall, which might suggest that pictures may not be equally effective for all learners.

4. Impact on Class Engagement: A strong majority (86.36%) indicated that the use of pictures makes the class more interesting. This shows that pictures not only aid in learning but also have a positive effect on student engagement, which is critical for maintaining student motivation in technical vocabulary acquisition.

5. Perceived Learning Benefits: A large proportion (72.73%) of students believed that pictures facilitate their learning of technical vocabulary, while 27.27% did not find pictures helpful. This suggests that while visual aids are beneficial for most, there remains a minority of students who may not benefit as much from this approach.

6. Reducing Anxiety in Learning: More than half (56.82%) of students reported that using pictures reduced their fear of making mistakes during exercises. This indicates that visuals can help lower students' anxiety, making the learning environment more comfortable. However, 43.18% did not experience this benefit, implying that visuals may not alleviate anxiety for all learners.

7. Encouragement to Use Vocabulary: A majority (65.91%) of students felt that pictures motivated and encouraged them to use the vocabulary items learned, reflecting that visual aids can inspire more active vocabulary use. However, a considerable portion (34.09%) did not feel the same level of motivation, suggesting that motivation might depend on other factors in addition to the use of pictures.

8. Long-Term Impact: More than half (59.09%) of the students believed that using pictures has had a long-term effect on their retention of vocabulary learned in the previous year. This indicates that pictures can have a lasting impact on vocabulary retention. However, 40.91% did not perceive a long-term benefit, suggesting that while pictures may be effective for short-term recall, their impact on long-term retention may vary among students.

The data reveals a generally positive student reception towards the use of pictures in teaching technical vocabulary. Visual aids appear to enhance recall, increase engagement, and reduce learning anxiety for many students. However, the effectiveness of pictures is not universal, with a notable minority of students indicating they do not experience the same benefits. This suggests the need for a balanced approach that combines visual aids with other teaching methods to cater to diverse learning preferences and maximize learning outcomes for all students.

10.2 Interview results

The teacher interviews aimed to explore their attitudes toward the use of pictures in teaching technical vocabulary to EFL engineering students. Five teachers participated in the interview process, providing valuable insights into the frequency of picture use, the perceived impact on students' learning, and any challenges faced in implementing this teaching method.

Question 1: Frequency of Using Pictures

Most teachers reported frequent use of pictures in their teaching. Teachers T1, T2, T4, and T5 mentioned that they often use pictures to support vocabulary learning, with T1 noting the visual aid's importance in providing clarity. T3 indicated that the use of pictures might vary depending on the curriculum and teaching approach, suggesting that not all instructors incorporate them regularly.

Question 2: Impact of Pictures on Understanding and Retention

All teachers agreed that pictures have a positive impact on students' understanding and retention of technical vocabulary. T3 emphasized the profound impact of visuals in enhancing comprehension of abstract concepts, while T5 mentioned that pictures make learning more concrete. Several teachers (T1, T2, T4) noted that visuals help with long-term memory retention.

Question 3: Student Engagement with Pictures

Teachers unanimously observed that students were more engaged and motivated when pictures were used in lessons. T2 and T4 specifically highlighted the lively atmosphere created by the use of pictures in the classroom, while T3 pointed out that visuals can capture students' interest and stimulate their imagination.

Question 4: Differences in Learning Outcomes

All teachers reported observing better learning outcomes in students who were exposed to visual aids compared to those who were not. T2 and T5 mentioned that students exposed to pictures demonstrated higher levels of participation and retention of vocabulary, with T4 noting improved outcomes in terms of both engagement and comprehension.

Question 5: Challenges in Using Pictures

Some teachers (T3, T4, T5) noted challenges in using pictures, such as finding appropriate visuals for complex topics or the unavailability of certain images. T2 mentioned the potential for pictures to be misunderstood by students. Strategies to address these challenges included complementing pictures with detailed explanations and using diverse visual resources to ensure clarity.

Question 6: Assessing the Effectiveness of Pictures

Teachers employed various methods to assess the effectiveness of pictures. T2, T4, and T5 mentioned using pre-tests and post-tests to evaluate student progress, while T4 also used observation and interviews. T3 noted that student performance and engagement during lessons were key indicators of the effectiveness of visual aids.

Question 7: Feedback from Students

Most teachers received positive feedback from students regarding the use of pictures. T1 reported that 90% of students found pictures helpful for understanding vocabulary, while T5 shared that students found learning with visuals easier and more enjoyable. T3 noted that student feedback might vary, but generally, pictures were appreciated as helpful learning tools.

Question 8: Alignment with Curriculum Goals

Teachers generally agreed that integrating pictures aligns with the goals of the EFL engineering curriculum. T5 noted that visuals support comprehension, retention, and practical application of technical vocabulary. T2 and T4 emphasized that pictures help with long-term memory retention, which is crucial for mastering technical terminology.

Overall, the interviews revealed a strong consensus among teachers on the benefits of using pictures to teach technical vocabulary to EFL engineering students. Teachers frequently use visuals in their lessons and report improved student engagement, understanding, and retention. While some challenges were noted, such as finding appropriate visuals for complex topics, teachers generally found ways to address these issues effectively. The positive feedback from students further supports the integration of pictures into the EFL engineering curriculum

11. Discussion of the results

11.1 Discussion of the questionnaire results

Discovering student's views on using pictures in learning technical vocabulary was one of the main objectives of the present study. For this purpose, a section of students' responses regarding this point indicated that the majority of the participants 'sometimes' use pictures in learning technical vocabulary with only a small fraction saying 'always'. This indicates that while pictures are incorporated into lessons, their use is not consistent across classes. Moreover, these results also indicated that the majority of students have a positive view towards incorporating pictures in learning technical vocabulary. This indicates that it is well-received by them. (Hattie,2012)

This tallies with the research by Trang (2022), who considers pictures as a positive visual approach since it helps learners develop a good attitude towards the learning of English vocabulary. In terms of the ability to recall technical words during exercises or exams and the long-term effect of remembering them, the majority of the students feel that using pictures helps them recall the meaning of technical terms during assessments. Moreover, the long-term effect of pictures on remembering technical vocabulary, indicates that visual aids contribute to deeper learning retention. Therefore, this indicates that

visual aids are effective in supporting memory retention. These results align with Trang (2022) who asserts that pictures can be kept longer in memory. The findings are also consistent with that of Imelda (2004) which confirms that pictures keep the words stay in student's memory for a long period.

Additionally, an overwhelming percentage of students believe that using pictures makes classes more interesting. Visual aids can, therefore, be considered an important tool for increasing student engagement. The results were in line with that of Power as cited in Donal (2012) who states that a high quality of learning can be achieved when students are interested and motivated. This is in accordance with Imelda as cited in Donal (2012) who confirms that pictures make the classroom atmosphere more interesting. Furthermore, A great deal of students think that pictures facilitate their learning of technical vocabulary. Accordingly, this reveals that visual aids are beneficial in making complex terminology easier to grasp. This is by Chung (2023) who maintains that visual aids such as images, diagrams and charts assist learning in comprehending complex terminology through a visual image.

In terms of encouragement to use vocabulary, most of the students believe that using pictures encourages them to use vocabulary items during lectures. This highlights the motivational aspect of using visual aids. In this regard, Felma (as cited in Sari (2017) considers that pictures can be employed in learning to motivate learners using helping them to think positively concerning their learning.

Overall, the results indicate a strong preference for and positive perception of using pictures in teaching technical vocabulary. Visual aids seem to play a significant role in enhancing recall, making learning more engaging, and encouraging the practical use of vocabulary items. However, the inconsistency in their application suggests room for improvement in terms of integrating visuals more systematically into lessons.

11.2 Discussion of the interview results

1. Frequency of Picture Use:

- Frequent Use: Most teachers (T1, T2, T4, T5) report frequent incorporation of pictures into their lessons, underscoring the essential role visuals play in helping students grasp technical vocabulary. These teachers highlight that pictures not only provide a visual understanding but also make abstract or complex terms more relatable and easier to comprehend. The frequent use of pictures is consistent with the belief that they cater to students with visual learning preferences, enabling them to better internalize and recall new vocabulary. The integration of pictures is particularly important in technical fields like engineering, where students often encounter unfamiliar terminology that can be challenging to explain verbally. By frequently using pictures, these teachers help bridge the gap between language and concept, enhancing overall comprehension and vocabulary acquisition. This approach aligns with the growing trend in education to incorporate multimedia tools to cater to diverse learning styles.

- Varied Use: T3 notes that the frequency of picture use may vary depending on teaching approaches and the structure of the curriculum. Some teachers may choose to rely on pictures sparingly, based on the specific learning objectives, the complexity of the topic, or the availability of suitable visuals. For instance, when teaching highly specialized or abstract technical concepts, it might be more challenging to find appropriate pictures that accurately represent the terms. Furthermore, T3's response highlights that the decision to use visuals can be influenced by the instructional design of the course, including whether the curriculum integrates or prioritizes multimedia tools. This variability indicates that while pictures are generally viewed as beneficial, their usage can be influenced by external factors such as curricular constraints or resource availability, reflecting a more nuanced understanding of how visual aids are deployed in the classroom. This aligns with the research by Mayer (2009), who argues that visuals can enhance learning by helping students process information more efficiently.

2. Impact on Understanding and Retention:

- Positive Impact: All interviewed teachers (T1, T2, T3, T4, T5) unanimously agree that incorporating pictures into teaching technical vocabulary has a substantial positive effect on students' understanding and retention. Visuals are viewed as a powerful tool for making abstract or complex concepts more tangible, allowing students to form mental images that reinforce learning. By providing a visual representation of technical terms, pictures serve as cognitive anchors, helping students connect new vocabulary with prior knowledge and real-world applications. This is particularly important in the field of engineering, where many terms represent intricate processes or machinery that can be difficult to conceptualize through words alone. This reinforces findings from previous research, which shows that visuals can be particularly beneficial for learners in technical fields, where abstract concepts may be difficult to grasp through text alone (Felder & Brent, 2005). The teachers' experiences are in line with dual coding theory, which suggests that information is more easily retained when it is processed both visually and verbally.

The consensus among the teachers highlights the pivotal role that pictures play in supporting the long-term retention of technical vocabulary, which is critical for students who will need to apply these terms in professional contexts. This is supported by Paivio's dual coding theory, which posits that information is better retained when it is presented both verbally and visually (Paivio, 1986).

- Enhanced Comprehension: Teachers also note that pictures significantly enhance comprehension, allowing students to grasp technical vocabulary more effectively than through auditory or verbal methods alone. Visual aids cater to different learning styles, particularly for students who struggle with language barriers or who may have difficulty understanding technical explanations in a foreign language. T2 and T4 specifically point out that students can retrieve information more easily when they have learned it visually. This echoes research findings that suggest visuals reduce the cognitive load by offering concrete examples, thus making it easier for students to understand and retain complex material (Mayer, 2009). The use of pictures not only helps students internalize the vocabulary but also makes the learning experience more engaging, fostering deeper cognitive processing. This dual benefit of improved comprehension and retention reinforces the argument for the widespread use of visuals in technical vocabulary instruction, particularly for EFL students who are managing both language acquisition and the complexities of technical subjects.

3. Student Engagement and Motivation:

- Increased Engagement: All teachers (T1, T2, T3, T4, T5) report that the use of pictures significantly increases student engagement and motivation. Visuals make lessons more stimulating and accessible, transforming what could otherwise be dry, technical content into something more relatable and easier to grasp. This is particularly beneficial in the context of EFL engineering students, who may struggle with the linguistic demands of technical vocabulary. By incorporating pictures, teachers create a lively classroom atmosphere that encourages active participation. As T4 mentions, pictures help make the classroom environment more dynamic and enjoyable, which in turn motivates students to invest more effort in learning. Research supports this observation, showing that visuals can spark curiosity and interest, leading to higher levels of attention and engagement during lessons.

- Interactive Learning: Teachers also emphasize that visual aids promote a more interactive and dynamic learning experience (T3, T4). Pictures serve as entry points for discussion and exploration, enabling students to engage with the material in a more hands-on way. For example, students may be prompted to describe or explain a concept depicted in a visual, leading to a richer, more interactive learning process. This aligns with empirical evidence suggesting that visuals can capture learners' attention, stimulate interest, and foster active participation (Clark & Lyons, 2010).

This level of interaction is particularly important for EFL students, as it provides opportunities for language practice while reinforcing technical concepts. T3 highlights that visuals can stimulate students' imagination, making the learning process more immersive and enjoyable. This aligns with findings from educational psychology, where it is argued that multimedia resources can enhance learning by engaging multiple cognitive channels, thus making the material more memorable (Mayer, 2009). The teachers' responses suggest that pictures do more than just clarify content, they actively transform the learning environment into one that fosters deeper understanding through interaction and engagement.

4. Differences in Learning Outcomes:

- Positive Differences: All teachers (T1, T2, T3, T4, T5) unanimously report significant differences in the learning outcomes of students exposed to visual aids compared to those who are not. The consistent use of pictures in teaching technical vocabulary has led to better comprehension, engagement, and retention among students. T1 and T2 particularly highlight how visual aids positively influence students' ability to understand and internalize vocabulary, indicating that students who engage with pictures tend to have a clearer and more comprehensive grasp of technical concepts. This observation aligns with research that suggests visuals enhance both the depth of understanding and long-term retention, particularly in complex subjects like engineering.

- Improved Outcomes: The teachers also observe that students exposed to pictures are more engaged, participate more actively in class discussions, and display improved vocabulary acquisition (T2, T5). T2 mentions that these students are "completely engaged and fully participate," which suggests that visual aids not only help students understand the material better but also motivate them to be more involved in the learning process. This echoes suggestions from previous research, which calls for a greater emphasis on developing high-quality, subject-specific visual aids (Felder & Brent, 2005). This engagement translates into better performance, as students can recall and apply technical vocabulary more effectively.

According to T5, visual learners in particular benefit from these aids, showing noticeable improvements in both vocabulary retention and practical application. The improved outcomes for students who use pictures underscore the critical role that visual aids play in bridging the gap between theoretical concepts and practical understanding.

5. Challenges in Using Pictures:

- Few Challenges: While T1 reports no significant challenges in using pictures, other teachers (T2, T3, T4, T5) identify various difficulties. T2 points out the potential for misunderstandings, where students may misinterpret the meaning or context of a picture, which can lead to confusion. This highlights the importance of selecting clear and contextually appropriate images, especially when teaching complex technical concepts. T3 mentions the challenge of finding suitable visuals for specialized or abstract topics, as well as the need for cultural sensitivity when selecting images, which can be particularly important in a diverse EFL classroom. T4 further emphasizes the unavailability of relevant visuals and the lack of clarity in some of the pictures used, which may hinder the effectiveness of the visual aids.

- Solutions: To address these challenges, teachers adopt various strategies. T3, T4, and T5 emphasize the importance of providing detailed explanations alongside pictures to ensure that students fully understand the context and meaning behind the visuals. This approach helps mitigate potential misunderstandings and reinforces the technical vocabulary being taught. Additionally, T5 mentions the strategy of complementing pictures with other forms of instruction, such as verbal explanations or written definitions, to avoid oversimplification and ensure that students grasp the complexity of the concepts. T4 also notes using alternative resources when suitable visuals are unavailable, underscoring the importance of flexibility and adaptability in teaching methods.

6. Assessment of Effectiveness:

- Various Methods: Teachers employ a range of assessment methods to gauge the effectiveness of using pictures in teaching technical vocabulary. T2 and T4 specifically mention using pre-tests and post-tests to measure students' progress and evaluate the impact of visual aids on vocabulary acquisition. This method allows for a direct comparison of students' understanding before and after exposure to pictures, providing measurable data on their effectiveness. T5, on the other hand, uses quizzes and class participation as indicators of how well students are grasping the material, with increased participation and correct responses suggesting that the pictures are enhancing comprehension. Additionally, T3 and T4 rely on observations of student engagement during lessons, noting that higher levels of attention and involvement often indicate that pictures are aiding the learning process.

These varied methods reflect a comprehensive approach to assessing the impact of visual aids, allowing teachers to adapt their strategies based on the results they observe.

- Feedback-Based Evaluation: In addition to formal assessments, teachers (T3, T4) also consider student feedback and their own observations to evaluate the effectiveness of pictures in enhancing learning. T3 notes that gathering feedback through surveys or classroom discussions helps to understand students' preferences and learning styles, offering valuable insights into whether visuals are making a meaningful difference. T4 echoes this, emphasizing that positive feedback from students often confirms the value of incorporating pictures into lessons. These methods align with assessment practices in visual learning research, where performance evaluations and feedback are commonly used to measure the impact of visuals on learning outcomes (Clark & Lyons, 2010).

7. Student Feedback:

- Positive Feedback: The majority of teachers (T1, T2, T4, T5) report receiving overwhelmingly positive feedback from students regarding the use of pictures in learning technical vocabulary. According to T1, 90% of students found it easier to understand concepts when pictures were used, and T2 and T5 similarly note that students consistently express those pictures making learning more accessible and enjoyable. These responses suggest that pictures help reduce the cognitive load, making complex technical vocabulary easier to digest and retain. T4 adds that students particularly appreciate the way pictures can explain technical terms more effectively than verbal explanations alone. This aligns with recommendations in the literature for curricula to incorporate more multimedia resources to enhance learning in technical subjects (Felder & Brent, 2005).

- Varied Feedback: While T3 acknowledges that most students appreciate the use of pictures, they also note that feedback can vary depending on individual learning preferences. Some students may prefer verbal or textual explanations, particularly if they are more comfortable with language-based learning. This variability underscores the importance of using a diverse range of teaching strategies to cater to different learning styles. However, T3 emphasizes that, on balance, students recognize the value of pictures in helping them understand and remember technical vocabulary.

8. Alignment with Curriculum Goals:

- Supportive of Curriculum Goals: Four teachers (T2, T3, T4, T5) express a strong belief that integrating pictures into lessons aligns closely with the objectives of the EFL engineering curriculum. They emphasize that visual aids play a crucial role in enhancing students' comprehension and retention of technical vocabulary. T2 specifically notes that using pictures has been proven to facilitate students' understanding and mastery of complex terms, which is essential for their future careers in engineering. T3 adds that visual aids enhance students' ability to interpret and communicate technical information effectively, that considers a critical skill for success in the engineering field.

- Need for More Visual Aids: Conversely, T1 highlights a gap in the current curriculum, pointing out the lack of visual aids and expressing a need for more resources that support teaching through pictures. This observation indicates a recognition of the potential benefits of visual learning, suggesting that the curriculum could be further strengthened by incorporating more visual elements. The call for additional resources aligns with findings in educational research that emphasize the importance of varied instructional strategies, including visuals, to cater to diverse learning needs (Hattie, 2012). By advocating for more visual aids, T1 underscores the necessity of adapting the curriculum to better equip students for mastering technical vocabulary engagingly and effectively. Overall, the teachers' responses indicate a strong alignment between the use of pictures and the educational goals of the EFL engineering curriculum, with an expressed need for enhanced resources to optimize teaching and learning.

12. Conclusion

EFL Engineering teachers' and students' attitudes toward utilizing pictures in teaching and learning technical vocabulary have been examined and analyzed in this research. The findings substantiated the following conclusions: the majority of engineering teachers and students have positive attitudes of using pictures in teaching and learning technical vocabulary; pictures make learning more engaging, motivated and encouraged the use of technical vocabulary; pictures provide a visual representation of technical terms, as many terms represent complex processes that can be difficult to clarify through words alone; pictures improve students' ability to grasp and retain technical vocabulary; to finish, pictures are significant in engineering as the unfamiliar terminology can be challenging to explain verbally.

Student's questionnaire

Question
1. How often does your teacher use pictures in the classroom?
2. What is your attitude towards using pictures as a teaching aid in learning technical vocabulary?

3. Does using pictures enable you to recall the meaning of technical words during exercises or exams?
4. Does the class become more interesting if the teacher uses pictures when teaching technical vocabulary?
5. Do you think that pictures facilitate your learning of technical vocabulary?
6. Does using pictures in teaching you technical vocabulary decrease your fear of making mistakes when doing exercises?
7. Does using pictures in teaching you technical vocabulary motivate and encourage you to use these vocabulary items?
8. Has using pictures for teaching vocabulary that you learned during your past study year had a long-term effect?

Appendix B: Teacher Interview Form

Dear teachers, this interview aims to find out your attitude towards using Pictures in Teaching and Learning Technical Vocabulary, your answers will be used for research purposes only. Thank you for your cooperation.

1. How frequently do you incorporate pictures into your teaching of technical vocabulary to EFL engineering students?

2. What is your perception of the impact that pictures have on students' understanding and retention of technical vocabulary?

3. In your experience, do you find that students are more engaged and motivated when you use pictures to teach technical vocabulary?

4. Have you noticed any differences in the learning outcomes of students who are exposed to visual aids versus those who are not?

5. Have you observed any challenges or limitations in using pictures to teach technical vocabulary?

6. How do you assess the effectiveness of using pictures in teaching technical vocabulary? Are there any specific evaluation methods or indicators you use?

7. Have you received any feedback from your EFL engineering students regarding their attitudes towards using pictures in the classroom for learning technical vocabulary?

Appendix B.

A.1. Teacher Interview Form

Dear teachers, this interview aims to find out your attitude towards using Pictures in Teaching and Learning Technical Vocabulary, your answers will be used for research purposes only. Thank you for your cooperation.

1. How frequently do you incorporate pictures into your teaching of technical vocabulary to EFL engineering students?

2. What is your perception of the impact that pictures have on students' understanding and retention of technical vocabulary?

3. In your experience, do you find that students are more engaged and motivated when you use pictures to teach technical vocabulary?

4. Have you noticed any differences in the learning outcomes of students who are exposed to visual aids versus those who are not?

5. Have you observed any challenges or limitations in using pictures to teach technical vocabulary?

6. How do you assess the effectiveness of using pictures in teaching technical vocabulary? Are there any specific evaluation methods or indicators you use?

7. Have you received any feedback from your EFL engineering students regarding their attitudes towards using pictures in the classroom for learning technical vocabulary?

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