Vocabulary-Based Computer Assisted Language Learning (CALL)

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Abstract

This research aims to explore the implementation of Computer-Assisted Language Learning (CALL) in vocabulary instruction and its impact on students' vocabulary proficiency. The study employs a descriptive qualitative research design, utilizing purposive sampling to select participants. Data collection methods included questionnaires, observations, and documentary analysis to gather comprehensive insights into the effectiveness of CALL in the classroom. The findings reveal that CALL significantly enhances student achievement, with 86% of the students scoring within the excellent to good range in vocabulary assessments. The integration of computers in the learning process has been shown to positively influence vocabulary acquisition, making it a valuable tool in language education. Additionally, the use of CALL has been found to increase student motivation. The interactive elements provided by CALL, such as sounds, images, animations, and colors, contribute to making the learning experience more engaging and appealing for young learners. Consequently, CALL emerges as an effective method for both improving vocabulary skills and enhancing student engagement in language learning.

Keywords: Computer; Vocabulary Learning; CALL; Language Instruction.

Introduction

When teaching English, there are certain components of the language that should be taught in primary school, one of which is vocabulary (Susanto, 2017). Vocabulary is an important part of language in learning and teaching English (Syafrizal & Haeruddin, 2018). Vocabulary is central to language because it affects language skills. Students with limited vocabulary will also have limited understanding of speaking, reading, listening and vocabulary (Vu & Peter, 2021). Due to a limited vocabulary, students face difficulties in communicating with others. Therefore, vocabulary first teaches the first component for language learning (Cook, 2016). Teaching English to primary school students is different from teaching English to middle school students, high school students and adults because primary school students have unique characteristics such as being easily bored, easily forgetting things and restless (Copland & Garton, 2014). Teaching English as a first foreign language in Indonesia and Aceh is not easy, especially teaching vocabulary to elementary school children. According to the results of my interview with five primary school teachers in Banda Aceh in March 2023, they said that teaching vocabulary to primary school students is very difficult. Teachers say that it is easy for students to forget newly learned or memorized vocabulary during the day, so teachers should repeat and revise as much vocabulary as possible. In addition, elementary school students are active participants in the learning and teaching process, and therefore, when teaching vocabulary to students, teachers should use a variety of media to engage students as active participants in the learning process.

The media used in teaching primary school students plays an important role in teaching English. Accurate use of media will ensure success in the learning process. There are many media available for teaching English. One of them is the use of computers as teaching aids in English classrooms (Bajrami & Ismail, 2016). Computer-assisted language learning (CALL) refers to the use of computers to improve students' language skills (Hashmi, 2016). In addition, Nashri, *et al* (2021) provided a definition of computer-assisted language learning: the study of the implementation of computers in the teaching of English. The use of computers in language learning has some advantages. Barrot (2023) reported that CALL has contributed to pedagogy such as motivating students to learn and providing a remedial component. Gelan, *et al* (2018) adds that there are reasons why computers can be a good tool for teaching and learning because computers provide experiential learning and motivation, improve student achievement, provide authentic learning materials, and enhance interaction, independence, and global understanding. In addition, based on previous library research by Irani (2011), she reported that CALL can help students learn vocabulary through computer software such as games, animations, sounds, pictures, and colors. In addition, Olson, *et al*. (2021) explains the use of CALL in vocabulary learning, including exercises and practice programs (synonyms), multimedia tutorials (English vocabulary), games (Hangman, Scrabble) and as a reference and search tool. Franciosi (2017) further explains that computers can be used to develop vocabulary skills by linking CALL to vocabulary learning.

From the development of the advantages of CALL, CALL can be a positive alternative for teaching English, especially for teaching vocabulary. While conducting interviews and observations in some schools in Banda Aceh, the authors found that teaching English to primary school students is still a challenge. Some school teachers said that teaching vocabulary to elementary school students is not easy because students have unique characteristics such as being easily bored and actively participating in the learning process, and students can easily forget the vocabulary they have just learned or memorized during the day. Primary school teachers need extra energy, patience and innovation to control the learning process and use appropriate methods, techniques and media in the learning process to achieve success in vocabulary teaching and learning process (Tan, 2021). On the contrary, when I visited SDIT Nurul Fikri Aceh, I found that the English teachers at the school used computers to teach English vocabulary. This seems interesting because computers are not usually used in English primary education in Aceh. Based on the background mentioned in the previous section, the authors summarize the formulation of this research question as follows: What is the effect of CALL on the vocabulary performance and learning progress of fourth grade students in SDIT Nurul Fikri Aceh?.

Literature Review

Vocabulary is one of the essential components in learning language since it greatly influences the language abilities including speaking, reading, listening, and writing (Susanto, 2017; Syafrizal & Haeruddin, 2018). Lack of adequate skills in communication and comprehension are some of the difficulties that students who have a limited vocabulary experience (Vu & Peter, 2021). It is quite hard to teach vocabulary in primary education due to the students' characteristics such as; low attention span and high energy levels (Copland & Garton, 2014). Computer aided language acquisition and or instruction otherwise known as CALL has considerably grown to be a central component in today's education, particularly in the learning of vocabulary. Research has revealed that CALL affords the learners interactivity in the learning process, which immensely increases the effectiveness of their acquisition of new words (Chapelle, 2003). The type of multimedia in this technology combines different elements like sound, picture, as well as text inputs since they appeal to the different learning ability and greatly aid in retention of newly acquired lexical items (Coady & Huckin, 1997).

According to Nation (2001), the role of repetition is underlined when explaining how the vocabulary has to be repeated in different contexts, which is typical for the CALL platforms. In CALL, the learners can come across a new word in a given context, such as gaming, role play, storytelling and so on, which then help the learners to actually use the word in meaningful context. This tallies with the incidental vocabulary learning theory which posits that it is easier for learners to learn new words if they do it incidentally and not when they are specifically learning new words but are participating in meaningful activities (Huckin & Coady, 1999).

Besides, CALL tools have features of providing immediate feedback which is essential in the learning of languages (Li, 2010). This is important because immediate feedback to learner errors enables them to adjust their errors on the spot and minimize the formation of improper usage of the language. This constant correction and advice that is provided is way more helpful than the standard essay-feedback method where feedback could often be hours/days late. Research has also revealed that this kind of feedback helps raise learners' motivation and interest because such learners are likely to feel that they have a mentor who is helping them as they learn (Egbert, 2005). This means that there is a social factor added to CALL in vocabulary teaching and learning called learner control, (Beatty, 2010). Some technologies used in CALL are capable of diagnosing the current level of the learner's vocabulary and the current level of difficulty posted to the learning activities. This way, learners are constantly placed in a state of meaningful learning that offers them a reasonable level of difficulty, thus creating a favorable environment for their constant improvement. The use of personalization also enables learners to advance through the courses at their own pace since learners may cover different speeds and abilities (Levy, 1997). Last but not the least; CALL afford access to an enormous reservoir of actual materials, such as videos, articles and podcasts, which are referential for vocabulary (Godwin-Jones, 2011). Introduce actual artefacts to the learners by providing them with a feel of actual language use and this is made possible by using actual artefacts in the classroom. This exposure is equally important in the development of the pragmatic and sociolinguistic competence in addition to the knowledge of the specific word lists. The fact that genuine material is incorporated in CALL makes the learning of words realistic, useful and thus improves he efficiency of language education (Gilmore, 2007).

Methodology

In this study, the authorss used descriptive qualitative research. According to Sundler, *et al*. (2021), qualitative research is a form of research in which the results are described in written words. Furthermore, descriptive qualitative research aims to describe the processes and strategies involved in data analysis and interpretation. In this study, the authorss analyze the impact of CALL on students' vocabulary performance and the teaching process. This study was conducted in SDIT Nurul Fikri Aceh. The school is located on Jl. Nek, Desa Lamtheun, Aceh Besar. The school has 713 pupils. There are 18 classes in total, from first to sixth, with three classes in each class. After reading references about CALL, I finally found out that the school that uses this medium to teach CALL vocabulary is SDIT Nurul Fikri Aceh. Here, the authors observe how teachers implement CALL in vocabulary teaching to see how it affects students' vocabulary performance.

The subjects of this study are the English teacher of the school, the students of class IV/B, the total number of students is 40. The authors chose this class because the students in this class are at an average level in terms of academic achievement compared to other classes. The English results in their reports confirm this. Therefore, students in this class are suitable as the subject of this study to find out whether CALL has a better effect on improving students' vocabulary scores. As the target of this study is the teachers and students of Class IV/B, the results of this study cannot be generalized due to the safety of the phenomenon. The research tools for data collection in this study are observations, field notes, teacher structured interviews, teacher tests, student questionnaires, and documents. Observation is carried out by visiting classrooms, recording all information about the activities of teachers and students, without directly interfering with the tasks of teachers and students. Use field notes to record learning activities so you can use CALL to get more effective information about the learning process. To gain a more detailed understanding of the impact of CALL on vocabulary learning, the authorss had students complete a simple questionnaire (yes and no) and conducted structured interviews in the teachers' free time. The questionnaire consisted of 10 questions and asked students about the impact of CALL implementation based on their input.

In addition, structured interviews were used to obtain more specific information that was not available during the observation. Teachers use the test to understand whether CALL affects students' English vocabulary skills. In qualitative research, documents can be one of the data used for analysis. In this study, the authors used teachers' lesson plans to understand the process of using computers for teaching and learning English.

Data collection methods

Data collection methods used in this study include observation, questionnaire survey, field notes, interviews and teacher tests. The authors came to the classroom to observe how teachers and students teach vocabulary. She also takes field notes during classroom observations using video, photos, and audiotapes. To provide results from the observed data, the authorss then administered yes-no questionnaires to students using CALL and teacher interviews to understand their perceptions of teaching and information about vocabulary learning. The purpose of this interview with teachers is to learn more about teachers' views on the implementation of CALL in vocabulary teaching and students' vocabulary performance. In addition, to understand students' vocabulary learning performance, the authors also collected data from the teacher's post-class assessment and compared it with KKM (Minimum Standard of English) to understand whether CALL is effective for students' vocabulary performance.

Validity and accuracy of instruments

The validity of qualitative research is related to the result of observation, interview, which really contains the necessary information based on the purpose of the research. Accuracy refers to the process of consistent and robust data collection, which involves efforts to achieve consistency between certain information and other information at different points in time. In this study, accuracy is achieved through direct observation of teaching and learning in the classroom using a computer. The authors also used triangulation. Triangulation is a strategy to improve the validity and accuracy of research or evaluation of findings (Moon, 2019). Triangulation is done by comparing data obtained from observations, field notes, interviews and documents. The data is divided according to the characteristics of the data and the type of instrument used. After the data audit, the results of the data findings are essential to the investigation of the problem, after which consultants are consulted and expert opinions and researches recorded in books, journals, etc.

Data analysis

Data analysis in qualitative research is a process of classification, description and synthesis. In this study, the researchers presented the field data descriptively and synthesized the data collected through observations, field notes, questionnaires with students, and interviews with teachers. The researcher targets, simplifies, organizes and reduces the data. This is done to make it easier for authorss to understand, interpret and understand the data corpus. The authorss collected all the data obtained in the study according to the classification of the research question and described it in the form of text using qualitative data procedures. This analysis also applies to experiences such as sudden thoughts, limited authors memory, etc. It also facilitates incremental data analysis by researchers. After field data collection, data analysis procedures were established. The study used three main data analysis procedures, including data collection, data reduction, and data presentation. Once all the data is collected, the next step is data reduction. This is done to discard irrelevant data and include relevant data. The next step is the data view, which includes the analysis of the data that occurred in the natural environment, so that the authorss can draw preliminary conclusions. Finally, after the interim conclusion, the writer referred to data collection, data reduction and data representation. The final conclusion was drawn after analyzing the interim conclusion. When analyzing the questionnaire data, the authorss used percentages (Kaur, *et al*, 2018):

$$P = F/N \ x \ 100 \ \%$$

Where:
P   = Percentage
N   = Number of students
F   = Frequency
100   = constant.

Results and Discussion

Results
The Impact of CALL on Students' Vocabulary Achievement

To support student performance data, teacher-given test results are needed as a reference for student performance in vocabulary learning through CALL. The results of the students' marks can be seen in the picture below.

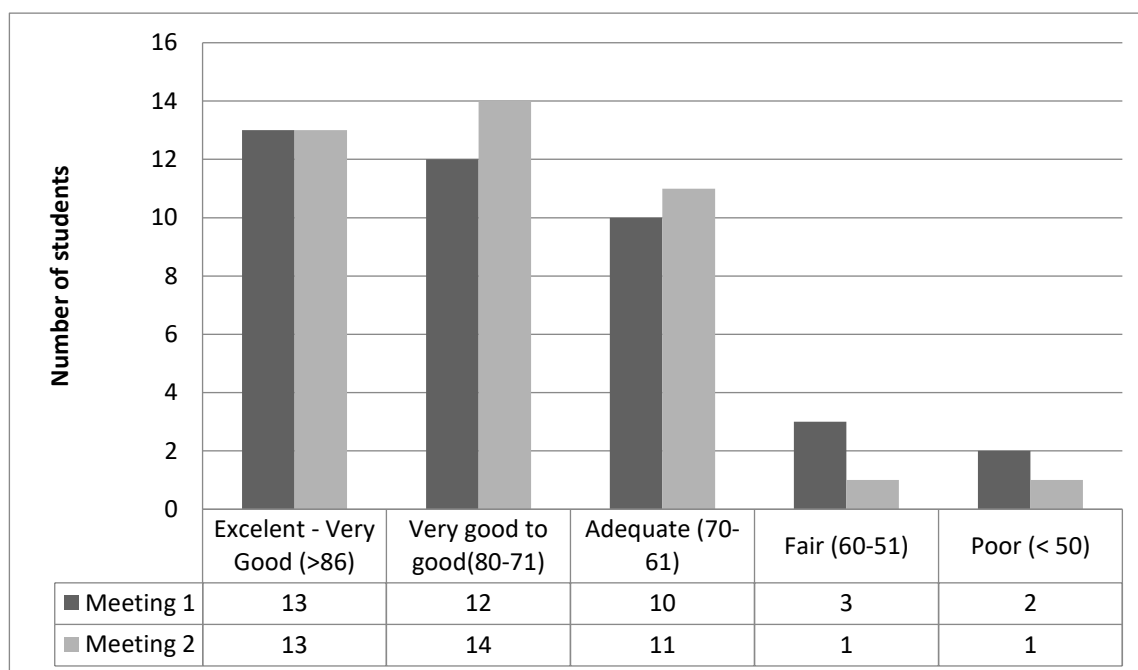|	Excelent - Very Good (>86)	Very good to good(80-71)	Adequate (70-61)	Fair (60-51)	Poor (< 50)
■ Meeting 1	13	12	10	3	2
■ Meeting 2	13	14	11	1	1

Figure 1. The Students' Vocabulary Score Using CALL

The graph above shows students' vocabulary scores after using computer-based instruction in the first and second sessions. In the first session, the graph shows that the majority of students are excellent to very good (33%) or 13 out of 40 students, 30% or 12 out of 40 students are very good to good, 25% or 10 out of 40 students pass, 7% or 3 out of 5 out of 5 can reach average level or 0 can reach average level or 0. This means that the use of computers in English language teaching has a positive effect on students' performance in vocabulary learning. Many students (86%), or 35 out of 40 students, passed the course with a passing grade (65). On the other hand, 5 out of 40 students or 14%. In the second session, like the first session, many students (95%), or 37 out of 40 students, were rated excellent to good, while only two students (5%) were rated fair to poor. Combining students' grades and interests, the teacher described his views on computer use in English classes as follows: "Since the introduction of computers in English classes at this school, there has been a dramatic improvement in student performance. Compared to non-technical classes, students are more active and interested in the learning process. The students' average English score has improved, and it is easier to control the class."

The process of teaching vocabulary using CALL

The authors detailed the learning process using classroom observation and field recording. The authors observed class IV B. There are 40 students in this class, of which 19 are girls and 21 are boys. At the beginning of the lesson, the teacher led the students to the computer room. The computer room consists of 16 computers with 18 tables and chairs, whiteboards, projectors and speakers. Since there are not enough tables, chairs and computers, the teacher recommends that the students sit on the floor and listen to the teacher's speech and the video played on the projector through the computer. First, the teacher greets the students, then reviews what they have learned before about the spelling of words, then leads the students to listen to the recording on the computer, and then the students write the answers from the textbook on paper (Bambanga Sugeng, Let's Make Friends with English, Esis, 2006). Most students focus on listening, but some students talk with their friends. The class fell silent after the teacher asked the students

to be quiet and focus on the speaker. The teacher then asks the students to repeat words such as evening, ruler, pencil, etc. Next, the teacher practiced. The teacher instructs the students to write down the spoken words. They are: School, Blackboard, Body, Head, Eyes, Happy, Camel, I like Durian, Emma and Elephant. In the second meeting, the teacher used the CD software. This CD was released by Ganeca Production in 2004. The CD features images of the library environment as well as animal animations (penguins). Penguins show the direction of the learning process with chart names; alphabet, our body, quizzes and games. Due to the lack of computers, only a few students are randomly selected by the teacher, and the teacher can control the computers during the learning process. It is very interesting. Students listen, see and answer the pictures, sounds and questions on the CD. The students seemed noisy, they wanted to control the computer but were not allowed to operate it. The teacher clicked on the questions and the answers to the questions, then the students answered the questions asked. owever, there are also some points that should be taken into consideration by the students. In the first meeting, the computer was used only as a teaching tool, the students' participation was passive. Students just follow instructions and answer questions. In the second meeting, using CALL in the lesson, there was also a positive atmosphere. Students become active in the learning process, students' interest increases and boredom decreases. The students seemed to be very happy in the learning process, answering the questions asked in the software published by Ganesh (2004), having small discussions with friends, solving problems and sharing ideas.

It is also interesting to look at materials that are presented using computer software. The software offers sounds, colorful pictures, animations, games and quizzes. The software captures students' attention through animations, images, colors and games. In this way, students follow the learning process step by step until the end of the course. Although there are many advantages of using CALL in the vocabulary classroom, teachers and students still face some challenges in using CALL for teaching and learning vocabulary. First, computer availability is still low. At this school, there are only sixteen computers available for students to use during classes. This means that about half of the students cannot use a computer. In theory, students in a CALL classroom should be able to operate the computer themselves. They become the center of the learning process and remain active in the learning process. Teachers act only as facilitators and guides in the learning process. Second, the results of the interviews showed that the school teachers did not understand the term CALL and its order and organization in the classroom. She believes that the computer can only be used as one of the teaching aids, but she has no basic knowledge about using the computer in English vocabulary lessons.

Students' perspectives on learning English, vocabulary and CALL

To support the data from the observation of the students' activity during the lesson, the authors distributed questionnaires to the students. The results of the questionnaire survey on the opinion of students about teaching English vocabulary are shown in the figure below:
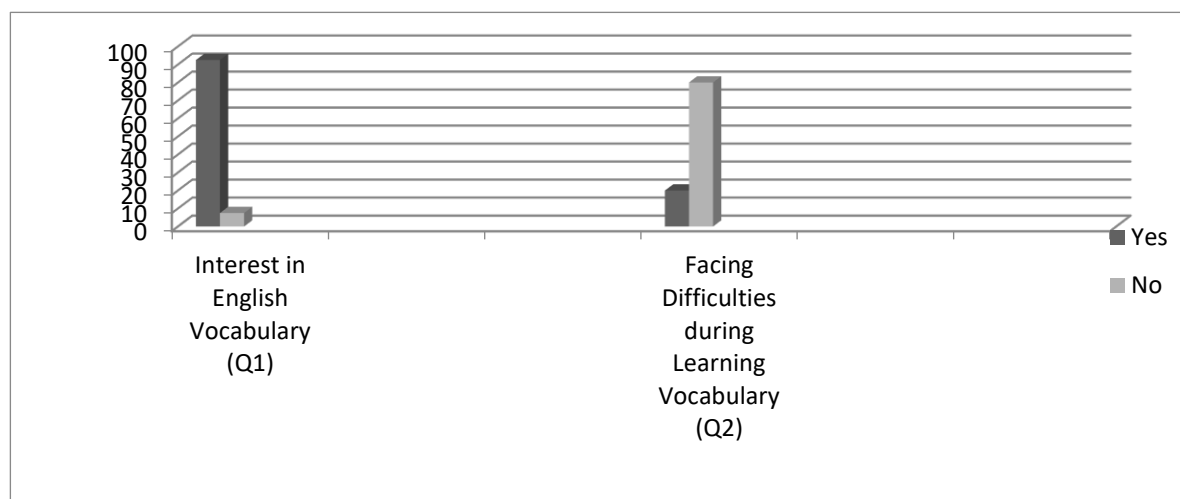

Figure 2. The Students' Opinion about English Vocabulary

The graph above shows that about 93% (or 37 out of 40 respondents) most students are interested in English vocabulary. This shows that students have a positive attitude towards learning English vocabulary. Only 7% of students (ie 3 out of 40 students) were not interested in learning vocabulary. The second point shows that 20% or 8 students indicated that they encountered difficulties in the vocabulary learning process. 80% (32 students) said they had no problem learning vocabulary. This means that some students still have problems learning English vocabulary. Regarding the use of computers in education, the graph below shows the results:
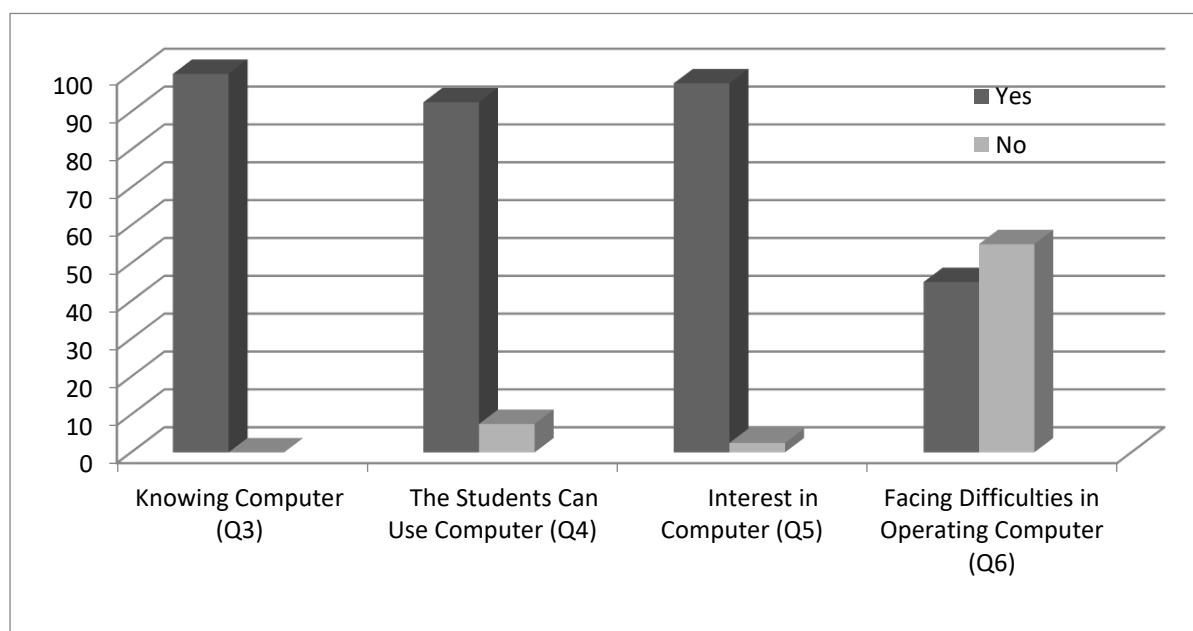

Figure 3. The Students' Opinion about the Use of Computer during Learning Vocabulary

The data presented in the chart reveals several important insights into the familiarity and comfort level of primary school students with computers. Notably, it is evident that every student (100%) demonstrated an understanding of computers, which suggests that technology has become an integral part of their daily lives, even at a young age. This high level of familiarity with computers is further supported by the finding that 93% of the students (37 out of 40) reported having access to a computer at home or school. However, a small portion of the students (7%, or 3 out of 40) indicated that they lacked access to a computer, which could potentially limit their opportunities for practice and skill development. The chart also highlights that a vast majority of students (98%, or 39 out of 40) did not find using computers challenging, indicating that they are generally comfortable with this technology. Conversely, only a single student (2%) expressed a dislike for using computers. Despite this overall comfort with computers, there remains a notable portion of the student population (45%, or 18 out of 40) who reported difficulty in working with computers. This suggests that while the students are familiar with computers, not all have fully developed the skills necessary to use them effectively in an educational. These findings underscore the importance of providing additional training and support for students to enhance their computer literacy, particularly in an academic setting. As computers become increasingly central to modern education, ensuring that all students can use them effectively is crucial for maximizing their learning potential. Moreover, the data suggests that while computers are a valuable tool for teaching and learning English vocabulary, ongoing efforts are needed to address the existing barriers that some students face in utilizing this technology. Regarding the use of computers in vocabulary learning, the chart below shows the results:
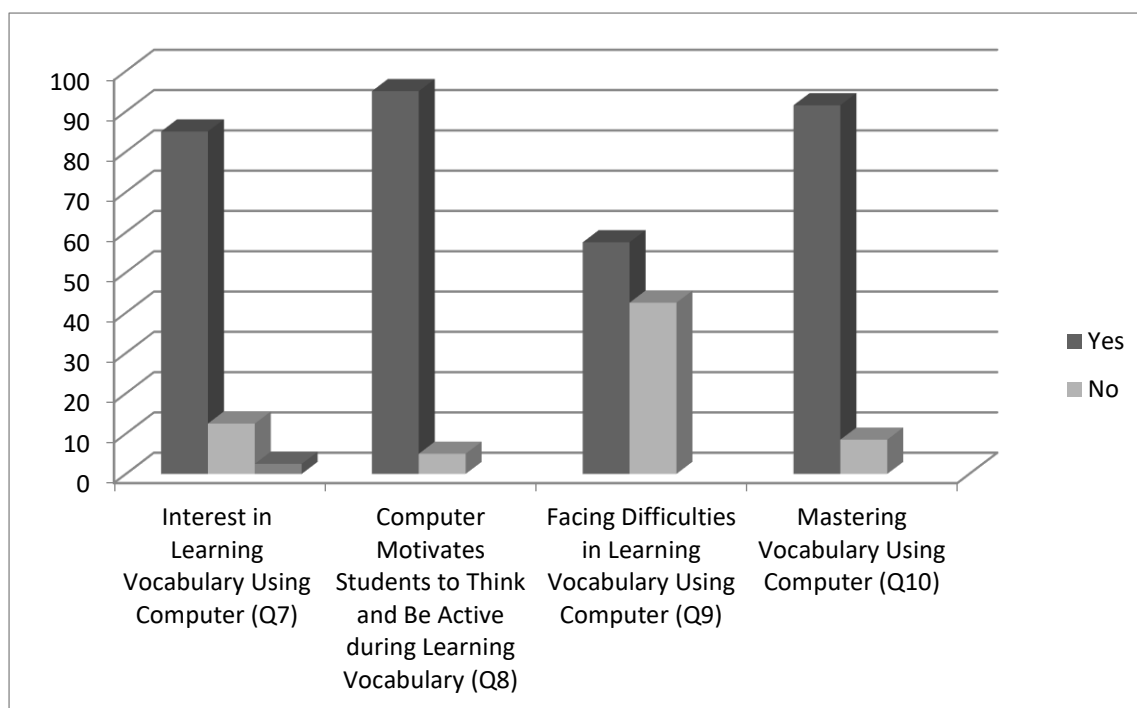
Figure 4. The Students' Opinion about the Use of Computer in Learning Vocabulary

Looking at the seventh item, 85% students (i.e. 34 out of 40 students) said they like using computers to learn English, while 13% students (i.e. 5 out of 40 students) said they don't like it, and one student said they don't like it. In the eighth report, 93% of students (37 out of 40) said that computers stimulate their thinking and motivation to learn English vocabulary. Only 5% of students (2 out of 40 students) admitted that the computer did not motivate them to think and be active, and 1 student abstained from voting. Item nine showed that 42% of students had difficulty learning vocabulary using computers, while 58% of students (i.e., 23 out of 40 students) said they had no difficulty learning vocabulary using computers. Finally, the last point showed that the majority of students (78%) or 31 out of 40 students believed that they can learn English vocabulary using the computer.

Discussion

The purpose of this study is to answer whether CALL affects students' vocabulary performance and the learning process of using CALL. After collecting and processing all the data obtained in observations, questionnaires and field notes, it is necessary to discuss the research results. Data show that CALL can improve students' vocabulary learning and create a positive vocabulary atmosphere. Students' grades after a CALL lesson can also be used as evidence of their progress in their vocabulary. In fact, the results showed that 86% of students were in the excellent to good category. The average score of students in the first session was 78.9, and in the second session - 81. This means that their vocabulary has improved significantly and most students have passed their school English subject with a passing grade (65). The reason for this may be that in the learning process, students not only receive information about the subject matter from the teacher and books, but also hear sounds, see pictures and read the material on the computer screen, thus the students get repetition of information and pay attention to the presentation of the material. This enables them to understand the topics displayed on the computer screen.

In addition, according to the observations, the authors found that the students were active and enthusiastic in the learning process. The results of the questionnaire survey also showed that most students have a positive attitude towards the implementation of CALL in vocabulary learning. Most students (85%) said they enjoyed using CALL to learn vocabulary. In addition, 78% of students believe that CALL helps them learn English vocabulary.

On the contrary, despite the advantages of CALL in teaching vocabulary to primary school students, teachers and students in SDIT Nurul Fikri Aceh still face some obstacles in the learning process. First, the number of computers in

this school is not enough. There are only fourteen computers in the computer room and the total number of students is forty. Unfortunately, only a computer and a projector are used in the learning process. The teacher is the one who works with the computer; students listen, watch and then answer the oral questions. No student is allowed to work on the computer alone.

According to some literature reports, students in CALL classrooms have the opportunity to operate the computer by themselves, and the teacher only plays the role of leader, guide, material selector, and student performance analyser (Taopan, *et al*., 2020). In this case, the teachers of the school did not allow the students to operate the computers themselves during the learning process. Teachers also directly intervene in student responses and act as decision makers. This incident affected the computer performance of the students. It assigns assignments based on student survey results. About half of students (45%), or 18 out of 40, said they had problems using computers. The results of the questionnaire did not surprise, because the students could not use computers themselves in the learning process. Therefore, students are not good at working with computers.

Second, the teacher does not know the rules of CALL; she used the computer only as a stockpile of materials and then asked the students to answer the questions in the student book. Some references indicate that teachers have a role to play in the CALL classroom. Teachers are no longer just sources of information, but also act as facilitators so that students can actively interpret and organize the information provided (Bailey & Lee, 2021; Haron, *et al* (2017)). Based on the feedback mentioned above, a teacher should be a person who provides help, support and advice to students who face problems in the process of learning English. Computers will never replace teachers either, but they provide new opportunities for better language practice. Teachers are still responsible for selecting materials, integrating them, setting specific goals, organizing review sessions and reinforcing acquired knowledge by monitoring conversations, praising and encouraging active student participation, which is essential to maintain student motivation (Nikic, 2021). In short, teachers are facilitators, guides, motivators, supervisors, selectors, creators, integrators, organizers, and promoters of the computer-based language process. Third, the classroom environment becomes a crucial factor supporting the success of the learning process. According to the authors' observations and interviews, the authors found that the teachers at the school did not understand the organization of the CALL lesson. The organization of computers, projectors and teacher positions forces students to pay attention to two aspects: the projector sees the front of the classroom and the teacher sees the back of the classroom. However, there are also CALL classroom settings that can be used as suggested by Shadiev, *et al* (2017) and Beatty (2004). First the teacher-led discussion, the focus of this room is the previous teacher-led discussion, also known as the lecture in the CALL classroom. Second, an outward-facing U-shaped CALL classroom that allows students to rotate chairs for a presentation or sit around a table for discussion. In this type of classroom, it is easier for the teacher to see what each student is doing. Third, the U-shaped CALL classroom is inward facing. This type of classroom allows students to face the teacher and still have a good view.

Conclusion

After observing the teaching and learning process in SDIT Nurul Fikri Aceh using CALL, the authors discovered some advantages of CALL in teaching English vocabulary. First, CALL can improve student achievement. The results showed that computers had a positive effect on students' vocabulary. Many students (86%) scored in the range of excellent to good. This means that CALL works to develop students' vocabulary. Secondly, the students' motivation will increase. This is because computers and sounds, images, animations and colors are connected, so it has become a more attractive tool for children. Even if there are many calls, this is not an absolute success in all aspects. Because computers are created by humans. Of course, computers also have their downsides during use. There are some barriers to using computers as an educational tool. The first is the financial barrier. Computer hardware and software are still expensive. Therefore, you must pay extra for providing the school with a computer class. As the author found in SDIT Nurul Fikri Aceh, access to computers in schools is still insufficient. The school has only 16 computers and each class has 40 students. Therefore, students cannot work with the computer themselves. In fact, one computer is used by one student, and the student can work on the computer independently. In addition, teachers should also

increase their awareness of CALL. The author found that a teacher in SDIT Nurul Fikri Aceh did not understand the CALL process and organized a CALL class. Therefore, students' skills to use computers to work independently and learn English vocabulary have not appeared. The authors conclude that computers can be an effective tool for teaching vocabulary. This can be a positive tool for teaching vocabulary because computers improve student achievement, motivation, and enable more interaction and active participation. This shows that CALL has a good effect on students' vocabulary learning and English vocabulary teaching.

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