



The Effectiveness of Computer-Assisted Language Learning (CALL) by Smartphones to Increase English Proficiency of Papuan EFL Students

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Abstract. This study aims to find out the effectiveness of Computer-Assisted Language Learning (CALL) by smartphones to increase English proficiency of Papuan EFL students. The mixed method was implemented specifically related to the explanatory sequential design (Quantitative-Qualitative) where the research design comprised two interactive sequential stages. The first stage was carried out by collecting and analyzing quantitative data using the pre-experimental method to find out the difference before and after being given treatment. The samples were determined using purposive sampling where 30 Papuan EFL students were selected, and data were analyzed by using SPSS. The second stage was carried out by collecting and analyzing qualitative data using structured interviews. The samples were determined using purposive sampling also, and 7 Papuan EFL students were considered representative to obtain data. The results show that Computer-Assisted Language Learning (CALL) by smartphones is effective to increase English proficiency of Papuan EFL students by a significant increase of 38.70%. The effectiveness of this learning cannot be separated from the aspects of efficiency, flexibility, and accessibility supported by excellence in terms of visualization and auditory systems. Moreover, some factors that certainly become constraints of Computer-Assisted Language Learning (CALL) including internet networks, small screens, notifications and advertisements, lack of proficiency towards applications, unsupported smartphones, and battery power. By solving all these constraints, CALL can be more effective to be applied in teaching and learning. The significant implication provides better change in the world of education through learning strategies in utilizing technology especially certain context and conditions in Papua.

Keywords: CALL, English, Papuan, EFL

Introduction

Technological developments have provided changes in the process of implementing teaching and learning. Ease of access and rapid change to technology in the teaching and learning process is utilized to further improve the quality of education. Computer-based learning influences the process of transforming conventional education into digital form (Keengwe & Georgina, 2018). Along with technological developments, mastering English as a foreign language is considered an urgency. Technology has a significant impact on learning English as a foreign language. English has become a tool that can facilitate students to communicate and interact with foreigners who do not speak Indonesian. Besides, many teachers have used computers and technology to develop English teaching and learning processes (Gheytsi et al., 2020).

Computer-Assisted Language Learning or CALL is a term used in learning language supported by computers and technology. It refers to all learning processes in which students use computers to develop and improve their language skills (Beatty, 2013). Computer-Assisted Language Learning (CALL) played a significant role in the development of language learning. CALL attempts to trigger the technology for effective and significant increase of language learning (Han, 2020). Some similar terms are used to represent concepts of CALL.

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Computer-Aided Instruction (CAI) does not necessarily focus entirely on language learning and the term instruction suggests a teacher-centered approach. Computer-Assisted Language Teaching (CALT) gives more emphasis on the teacher. Computer-Adaptive Learning Testing (CALT) focuses on testing language skills using a computer. Technology-Enhanced Language Learning (TELL) refers to language learning that any technology used in the classroom to improve students' language skills. Web-Enhanced Language Learning (WELL) refers to CALL which focuses on the world wide web as a teaching medium. In relation to learning English, there are several essential components that must be considered related to language skills and knowledge. Skills include speaking, listening, writing, and reading. Knowledge includes grammar, vocabulary, and pronunciation (Nunan, 2015).

From the previous observation by giving Likert questionnaires of motivation to Papuan EFL students about English learning, only 33% had high motivation in learning English. The rests showed medium and low motivation. The critical problems faced by Papuan students in learning English are boredom with conventional learning so that their motivation and interest in improving their English skills are gradually decreased. The Moreover, there is a lack of adequate language laboratories and computer equipment to be used effectively in learning English. Smartphones today are a communication tool supported by nano artificial intelligence-based computer devices that are used not only to communicate but also to complete multi-tasks of computers (Levy et al., 2011). Nevertheless, students generally only spend all their time with their smartphones to interact on social media and play games. The way out of the problems can be offered that smartphones based on Android and IOS can be used as a supportive tool for Computer-Assisted Language Learning (CALL) due to the fact that smartphones should be able to substitute the roles of language laboratories and computers as a medium in learning English. This substitution should be a breath of fresh air to solve the boredom of conventional teaching and learning.

Therefore, the study aims to find out the effectiveness of Computer-Assisted Language Learning (CALL) by smartphones to increase English skills of Papuan EFL students in the classroom. The results of this study are expected to improve students' English proficiencies, both spoken and written, and can be sustainably applied not only in English subject but in others. The results are also highly expected to give significant contributions in the world of education nowadays and future with better learning strategies in utilizing technology. The result should focus in giving significant contributions to enhance English proficiency of Papuan EFL Students by CALL and completely cope current issues about lagging education in Papua. Furthermore, it is expected to be a reference for further research and find new insights as a complement to the previous study.

Theoretical Framework

This study refers to several previous studies focusing on Computer-Assisted Language Learning (CALL) to increase English proficiency. The ability of students in learning English grammar shows progress using CALL. The progress reflects the positive correlation of learning grammar to their performance on grammar tests (Li & Hegelheimer, 2013). The use of personal computers greatly supports the improvement of students' English proficiency based on achievement scales (Al Seghayer, 2013). There is an increase in understanding related to the effects of student feedback and the development of collaborative skills in CALL implementation (Vurdien, 2013). Other findings explain that students who were instructed using CALL had higher scores than those who received conventional instruction (Kılıçkaya, 2015). Moreover, the integration of computer and pronunciation (Computer-Assisted Pronunciation Training) is superior in reducing students' pronunciation problems compared to only learning in the classroom (Luo, 2016).

Students who are less proficient in English tend to solely read the texts in CALL class, while more proficient students usually ignore reading and frequently produce improvisation with additional explanation in speech (Yeldham, 2018). CALL also improves students' English skills integrated into the Blogging for L2 writing in fully online language courses (Lee, 2017).

Then, four benefits of feedback on the use of CALL in learning English: (1) providing comfort and active learning, (2) increasing interest and satisfaction, (3) increasing cooperation and sharing, and (4) increasing the use of words (Ko, 2019). Nevertheless, Students' pronunciation skills in CALL do not improve significantly without targeted pronunciation training (Martin, 2020). By using personal computers to strengthen, the proficiency in speech, there is a significant increase in learning (Torres et al., 2020). From those previous studies above, the use of a smartphone as a substitution for a personal computer in Computer-Assisted Language Learning (CALL) is considered completely ideal nowadays.

The fundamentals of Computer-Assisted Language Learning (CALL) can be classified into eight categories. The first is a word processor. Most computers come with a pre-installed word processor such as Microsoft Word. Such programs are extensively used in the process of word structure composition. In general, word processors such as Microsoft Word are equipped with spelling and grammar corrections as well as a simple thesaurus program as standard tools (Beatty, 2013). The role of word processing in computers gives significant potential development of language skills. However, several barriers need to be overcome (Dalton & Hannafin, 1987). The second is games. Games can also be used for pedagogical purposes, especially in improving language skills. Spell checking, listening comprehension, fast reading, knowledge of synonyms and antonyms, general knowledge, and other English abilities may all be practiced using quiz-based games. Through games, students indirectly improve their language skills without realizing it (Beatty, 2013). Several advantages of using computer games offer exposure to the target languages, enhanced engagement, and increased students' involvement when communication occurs (Klimova & Kacet, 2017).

The third is literature. One way that students are given the stimulation to improve language skills is through activities related to literature review via computer. Great quality materials for the CALL program are literature which is now freely available in digital forms such as books in pdf extension and ebook formats and usually includes accompanying visual material (Beatty, 2013). Literature in digital formats, such as an ebook that students can easily access the learning sources, has a significant impact on increasing the quality of learning (Glackin et al., 2014). Fourth is the corpus. Corpus linguistics is part of applied linguistics, but it is also a useful tool for computer language teaching and learning. Both teachers and students can use the corpus in various ways in the classroom (Beatty, 2013). Through corpora implementation, students can improve the understanding of their language usage related to teaching and learning (Huang, 2011). Fifth is Computer-Mediated Communication. In general, computer-mediated communication refers to communication between persons or groups that are geographically or temporally separated (Luppicini, 2007). One of the most common activities related to CALL is communicating using a computer, which is referred to as Computer-Mediated Communication (CMC). CMC includes communication via email, bulletin boards, and chatlines using social networking internet services such as Facebook and Twitter (Beatty, 2013).

Sixth is the use of the world wide web (www). The use of the world wide web has also provided opportunities for the creation of websites dedicated to teaching and learning English for instance, BBC Learning English is one of the well-known English learning websites (Beatty, 2013). The web-based language project gave students a chance to improve their reading and writing abilities as well as, to varied degrees, their information-searching and problem-solving abilities (S. C. Yang, 2001). Seventh is another adaptation of material for CALL. In addition to material specifically intended for language learning, there are a lot of materials that can be adapted. Many applications and simulations not intended for language learning can be adapted for language learning purposes. This goes back to the teacher's creativity to adapt other materials for CALL (Beatty, 2013).

Eighth is the Personal Digital Assistant (PDA). PDAs are commonly used in education and have made them popular choices in learning, especially when combined with supporting accessories such as foldable keyboards, digital cameras, and modems that allow access to internet networks. The functions and uses of PDAs have now been combined into a device called a smartphone (Beatty, 2013). PDAs improve speaking skills, provide indirect feedback

on pronunciation, and expand opportunities for meaningful communication in the target language, but they also pose some difficulties for L2 learners (Dizon, 2021).

Computer-Assisted Language Learning (CALL) by smartphones is also often referred to as Mobile-Assisted Language Learning. In many ways, learning by smartphones has long been predicted to be one of the more advanced innovations in education. Smartphones have become a part of our everyday life and learning contexts. The use of smartphones in language learning is also very effective in overcoming the limitations of face-to-face learning. Language learning using smartphones has various advantages and limitations. The advantages of learning a language using smartphones are generally related to the inherent qualities of the device itself, involving better structures, fast connection, individuality and easy use (Levy et al., 2011). Smartphones provide high-speed internet access, a rich data mix, better quality audio, and moving images. Smartphones can also send music, pictures, and videos that are suitable for online learning. Data can also be stored on devices that can accommodate a lot of space or capacity. However, the limitations of learning a language using smartphones involve small typing keys resulting in unfriendliness users, small screen display, low screen resolution, slow processing, limited storage capacity, high cost, and risks of theft and damage.

The use of smartphones for language learning generally comprises two categories: language learning via smartphones using communication media such as Facebook, WhatsApp, Twitter, and Telegram, and language learning via smartphones using pre-installed applications and programs such as applications through Playstore and Applestore (Thomas et al., 2012). Besides, the benefits of Computer-Assisted Language Learning (CALL) by smartphones are, first, Students may interact with individuals at anytime and anywhere and access language learning resources more quickly and simply owing to this. The second benefit of using digital technology is that it makes it easier for students to participate in group and individual language learning activities both synchronously and asynchronously, which improves the effectiveness of speaking, listening, reading, and writing skills development. Third, mobile technology provides a variety of resources and tools for language learning that encourage language learners to be more socially motivated, independent, and interactive (Kim & Kwon, 2012). Language learning using computers and smartphones can be classified into three orientations of instruction, namely: 1) teacher-driven language instruction in which students focus primarily on teacher instructions, 2) computer-based language instruction in which students focus only on computers, 3) computer-based language instruction that driven by the teacher where students focus on the computer as well as the teacher. Therefore, to explore CALL by smartphones related to teacher instruction. It is considered four essential descriptions that can be used as a reference involving enhancement of knowledge about CALL and the types of activities that are effective in the classroom, the impact of CALL on teaching and learning, certain factors that make a difference for teachers who use CALL in class and mastering new ideas about CALL after completing the course (Kılıçkaya, 2015).

Material and Method

This study is appropriately considered to agree with a mixed method due to the fact that the study of Computer-Assisted Language Learning (CALL) by smartphones needs not only proven hypothesis but problem solving as well as deeper exploration of the subject. This study uses a mixed method, specifically the explanatory sequential design (Quantitative-Qualitative) where the research design consists of two interactive sequential stages (Creswell & Clark, 2017). In the first stage, collecting and analyzing quantitative data, which are carried out, has priority to answer questions in the research. The second stage is collecting and analyzing qualitative data following the first phase. Researchers generally interpret qualitative data to help explain the results obtained in the quantitative data. The stages are specifically explained as follows: The first stage was carried out by collecting and analyzing quantitative data using the pre-experimental method to find out the difference before and after being given treatment. The samples were determined using purposive sampling where 30 EFL students were selected from the Faculty of Islamic Economics

and Business IAIN Fattahul Muluk Papua who were considered representative of the study. The instrument of the study was questionnaire of grammar and vocabulary test formulated by accurately noticing the learning topic of CALL before giving test. Then, data were analyzed using SPSS. The second stage was carried out by collecting and analyzing qualitative data using structured interviews. In conducting structured interviews, research instruments were prepared in the form of questions in which alternative answers had been predicted. The samples were determined using purposive sampling from the Faculty of Islamic Economics and Business IAIN Fattahul Muluk Papua who were considered representative for the interviews as many as 7 EFL students as respondents.

Results and Discussion

Results

The data that was collected for both the pre-test and post-test were processed and quantitatively examined to determine whether there were any significant differences between the two phases before and after receiving a treatment of computer-assisted language learning (CALL) via smartphones. The data that was processed is the accumulated scores from the grammar and vocabulary aspects both pre-test and post-test. The following pre-test and post-test data are presented in the following table:

Table 1. The Average Scores of CALL

Scores	English Proficiency of Papuan EFL Students
pre-test	50,19
post-test	69.61

Based on the table above, it can be described that the average pre-test score is 50.19 and the post-test average score is 69.61. According to the statistics, students' English proficiency increased after receiving treatment in the form of Computer-Assisted Language Learning (CALL) by smartphones. There is a substantial difference between the pre-test and post-test results.

Further description of the data also needs to be elaborated. The main objective in analyzing the results of the pre-test and post-test is to measure the effectiveness of Computer-Assisted Language Learning (CALL) by smartphones on students' English proficiency before and after receiving treatment in learning. The following descriptive statistics provide an overview of the data that can be viewed from the calculation in terms of mean, derivation standard, variance, maximum and minimum:

Table 2. Descriptive Statistics of CALL

	N	Min	Max	Mean	Std. Dev	Variance
Pre-test	30	12.86	85.71	50.19	18.48	341.55
Post-test	30	28.57	95.71	69.61	17.61	310.31
Valid N	30					

Based on the table above, it can be seen that the average pre-test score is 50.19, the maximum value is 85.71 and the minimum value is 12.86. While the average score of post-test score is 69.61, the maximum value is 95.71 and the minimum value is 28.57. From the description of the data above, it can be seen that the difference in the average or mean scores of the pre-test and post-test is significantly different. To strengthen the evidence from the data, the analysis can be shown whether the treatment from the effectiveness of Computer-Assisted Language Learning (CALL) by smartphones is significant or not.

After conducting a descriptive statistic test, the next step is to attest a normality test on the pre-test and post-test. The normality test is the test carried out that aims to assess the distribution of the data normally or vice versa. More clearly, the normality test is carried out to find out whether the pre-test data and post-test data are normally distributed or not. Normality

tests on pre-test and post-test with the treatment of Computer-Assisted Language Learning (CALL) by smartphones are carried out using the Kolmogorov-Minorv statistical test through the SPSS. The following results of the normality tests are presented in tables:

Table 3. Normality Test of CALL

Kolmogorov-Smirnov Test		Pre-test	Post-test
N		30	30
Normal Parameters ^{a,b}	Mean	50.1907	69.6190
	Std. Deviation	18.48108	17.61587
Most Extreme Differences	Absolute	.102	.143
	Positive	.075	.082
	Negative	-.102	-.143
Test Statistic		.102	.143
Asymp. Sig. (2-tailed)		.200 ^{c,d}	.121 ^c

- Test distribution is Normal
- Calculated from data
- Lilliefors Significance Correction
- This is a lower bound of the true significance

From the calculation of the normality test presented in the table above, the pre-test obtained a sig 0.200, while the post-test obtained a sig 0.121. The ratio of the value shows $\alpha = 0.05$, the pre-test sig $> \alpha$ ($0.200 > 0.05$) and the post-test sig $> \alpha$ ($0.121 > 0.05$). Based on the description of the data, it can be concluded that both pre-test data and post-test data are normally distributed.

Due to the distribution of pre-test and post-test, data is normally distributed and the t-test can be used to find out the effectiveness. T-test is a type of parametric statistical test used to prove the significance and relevance of research samples. In the following t-test, one sample test was carried out using the SPSS with a significance level of 5%. The hypothesis is H_a : There is a significant difference in learning based on Computer-Assisted Language Learning (CALL) by smartphones to increase English proficiency of Papuan EFL students and H_o : There is no significant difference in learning based on Computer-Assisted Language Learning (CALL) by smartphones to increase English proficiency of Papuan EFL students with conditional criteria if the significance < 0.05 then H_o is rejected as well as If significance > 0.05 then H_o is accepted. The calculation is described based on the following table:

Table 4. T-test of CALL

Class	df	Sig. (2-tailed)	α	t-test	t-table
<i>Pre-test</i>	29	0,000	0,05	10.560	2.045
<i>Post-test</i>					

Based on the result of the t-test, it is obtained that $\alpha = 0.05$ is smaller than sig. (2-tailed) or ($0.000 < 0.05$) and $t\text{-test} \geq t\text{-table}$ ($10.560 \geq 2.045$), it can be concluded that there is a significant difference between the pre-test scores and post-test scores. This means that after receiving treatment using Computer-Assisted Language Learning (CALL) by smartphones, the English proficiency of Papuan EFL students increases significantly. To attest to the hypothesis, $t\text{-test} \geq t\text{-table}$ gives an answer that H_o is rejected and H_a is accepted. The hypothesis apparently shows that there is a significant difference in learning based on Computer-Assisted Language Learning (CALL) by smartphones to increase English proficiency of Papuan EFL students.

In addition, to show the significance of increasing English proficiency of Papuan EFL students before and after being given the treatment of Computer-Assisted Language Learning (CALL) by smartphones, the Paired Sample Test calculation is used and the final result of

significance is shown by percentage value. The calculation is described based on the following table:

Table 5. Paired Sample Test of CALL
Paired Differences

Pre-test Post-test Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df
			Lower	Upper		
-19.42	10.07	1.83	-23.19	-15.66	10.56	29

The table above shows paired differences with a value of -19.42 obtained from the difference value in the Paired Samples Test:

$$\frac{69.6190 - 50.1907}{50.19} = 38.70\%$$

The final score from overall calculation 38.70% showed a significant difference between pre-test and post-test of Computer-Assisted Language Learning (CALL) by smartphones. Score of 38.70% refers to range of influence by using CALL of smartphone compared by conventional teaching and learning. It means that using CALL by smartphones can improve students' English proficiencies.

Subsequently, the results of qualitative data by interviewing 7 Papuan EFL students are displayed in the form of transcription. Nevertheless, it is not attached in its entirety owing to the long transcription. Therefore, only essential representations of transcription are attached. The entire transcription describes effectiveness of Computer-Assisted Language Learning (CALL) by smartphones, efficiency, flexibility and accessibility of Computer-Assisted Language Learning (CALL) by smartphones, influence of visual and auditory systems of Computer-Assisted Language Learning (CALL) by smartphones, and limitations in Computer-Assisted language Learning (CALL) by smartphones. The transcription representations are described as follows:

Respondent 1: *I think it's effective because I myself prefer to read on my smartphone, it's more practical, at least we just mark what's important, we can take it anywhere, we don't need to carry too many books, we just have to open the application, everything is there. There is an improvement in English because at home you can look around, you can read while.*

Respondent 2: *In my opinion, I really prefer going online using a smartphone. if using a smartphone, it's easier to understand and easier to keep up with the times too. For example: there are also things I don't understand, I can google for them on my smartphone too.*

Respondent 3: *It's easy to understand by a smartphone and it's simpler and you can hear the English pronunciation right away on your smartphone. There is an increase of knowledge and I usually open the English application at home.*

Respondent 5: *In my opinion, it's more effective via a smartphone and it's more efficient. I don't need handwriting anymore because everything is on the smartphone. I can study at home too. So, it's easy for me to understand English.*

Respondent 6: *I think both are good and people also have different ways of learning. But in my opinion, it's easier for me to understand when I'm using a smartphone. Because it saves my time, for example: if you use an ordinary blackboard and you have to write first, right? It saves time, and the material is also more complete, for example: if someone forgets to write in the manual. My English is improving little by little.*

Responden 7: *I think it's better to use a smartphone. I prefer it when learning to use a smartphone that is easier for me to understand, lots of examples with pictures, lots of material in the pictures. If I use my smartphone, it really helps to improve my English because the material is easy for me to understand by using my smartphone.*

Discussion

The discussions are constrained to find out the effectiveness using Computer-Assisted Language Learning (CALL) by smartphones, to quantitatively attest the significant contribution of CALL to increase Papuan EFL students' proficiencies, and to qualitatively elaborate what extend the effectiveness of CALL. Several limitations of using CALL by smartphones are also discussed.

Effectiveness of Computer-Assisted Language Learning (CALL) by Smartphones

From the calculation above, it can be attested that the English proficiency of Papuan EFL students after using Computer-Assisted Language Learning (CALL) by smartphones is better than those of conventional learning with a significant difference of 38.70%. It means that using CALL by smartphones can enhance students' English skills. Therefore, to answer the problem of the study, it can be stated that Computer-Assisted Language Learning (CALL) is effective to increase English proficiency of Papuan EFL students. It can be assumed that some advantages of using CALL related to English proficiency as a foreign language have been gained in some areas including grammar, vocabulary, pronunciation, speaking, listening, writing, and reading.

Efficiency, Flexibility and Accessibility

To help describe the results obtained in the quantitative analysis stage which has proven that Computer-Assisted Language Learning (CALL) by smartphones is truly effective in improving English language skills as well as provide a description of what causes learning based on Computer-Assisted Language Learning (CALL) by smartphones is more effective than conventional learning. Moreover, data analysis was carried out qualitatively by interviewing seven Papuan EFL students.

The efficiency, adaptability, and accessibility of the learning medium used to study English have a significant impact on how well students' English skills can be improved, according to the findings from the first respondent, fifth respondent, and sixth respondent. Students tend to study by using learning media that are practical and effective. They feel no need to be burdened with carrying books that might be considered heavy to bring everywhere. By using a smartphone, they can study anywhere and anytime and get learning materials more quickly and easily. This seems to have been ingrained in them as generation Z, the generation that grows, develops, and utilizes all-digital and sophisticated technology and has grown up with access of the internet and portable digital technology from a young age in line with the education of 5.0.

Related to the aspect of flexibility, Computer-Assisted Language Learning (CALL) to improve students' English skills where the focus on aspects of some skills that utilize computers allows students to practice extensively what they have learned without time and location restrictions (Y.-F. Yang, 2012). CALL by smartphones is essential to solve problems related to time and space. Related to the aspect of accessibility, one of the benefits of learning using CALL by smartphones is allowing students to more easily and quickly to access language learning materials (Kim & Kwon, 2012). Easy and quick access to materials in learning can enhance the quality of learning itself. Moreover, the aspect of efficiency is also influential which should be an addition and complement to these two previous aspects.

By focusing on these three aspects which include efficiency, flexibility and accessibility in the implementation of Computer-Assisted Language Learning (CALL) by smartphones in the class, students feel learning English becomes more practical and effective without being

constrained by time and space and they can learn English anytime and anywhere. It is also easier to access learning materials. Furthermore, all things of teaching and learning related to efficiency, flexibility and accessibility of learning media where smartphones as multifunctional media are used both as communication tools and learning media without having to be constrained by various things that are often experienced in conventional learning. Therefore, Computer-Assisted Language Learning (CALL) by smartphones with a higher level of efficiency, flexibility and accessibility is more effective to increase English proficiency of Papuan EFL students compared to conventional learning.

Influence of Visual and Auditory Systems

Interview results from the second respondent, the third respondent, and the seventh respondent where their answers provide an overview of learning English based on CALL using a smartphone that is easier to understand owing to the fact that learning using a smartphone provides better visualization and auditory which is more varied than conventional learning. Learning objectives can be accomplished with the use of well-designed audio-visual learning materials. Each sort of audio-visual learning content has unique qualities, strengths, and weaknesses. Using audio-visual learning resources can speed up the learning process and enhance the information in learning materials (Fuady & Mutalib, 2018).

Learning activities supported by a variety of multimedia visualization systems are beneficial in facilitating language skills. In addition, students can remember new vocabulary better, practice speaking skills more often, become competent in language and linguistics performance, and improve their learning ability (Hwang et al., 2016). Better visualization related to the representation of an object, situation, or set of information as an image, such as pictures that can help in learning English, especially vocabularies. Of course, with these various visualizations, students will find it easier to absorb language knowledge and skills. Then, the integration of computer-assisted pronunciation training is superior in reducing students' pronunciation problems compared to just conventional learning in class (Luo, 2016). Learning English with the aid of auditory systems will more readily stimulate students' listening, speaking, and pronunciation skills, enabling them to comprehend and simulate language-related information more quickly and accurately.

As we are currently experiencing in the era of education 5.0, where society is fully dependent on technology in the world focusing on education, some points related to learning models and methods will all be synchronized with the rapid advancement of technology. This will be dominated by aspects related to visualization and auditory aspects. Therefore, in line with what has been stated by previous studies that Computer-Assisted Language Learning (CALL) by smartphones which are supported by advantages in terms of varied visualization and auditory is also more effective in improving English proficiency of Papuan EFL students compared to other conventional learning.

Based on the interview with the fourth respondent, it turns out that not all students prefer and choose to study using Computer-Assisted Language Learning (CALL) by smartphones. It was found that some students prefer conventional learning because conventional learning is easier to understand. Thus, it can be concluded that not all students prefer studying by CALL. In terms of interest and motivation, several students are more likely to choose conventional learning using the blackboard as a medium and lecturers who dominate the direction and learning materials in class. However, based on the analysis of the quantitative calculations described above, students still experience a significant increase in learning using CALL by smartphones compared to conventional learning. The materials are still absorbed unconsciously in CALL and it is also more effective than conventional learning. It can be assumed that there is a paradox between the results achieved by students in learning and their interest and motivation. This case will be much more interesting to study in further research.

Limitations in Computer-Assisted language Learning (CALL) by Smartphones

Utilizing smartphones to learn English has given students new probabilities and a variety of learning experiences. The use of smartphones for English learning did not present any barriers for the students (Ta'amneh, 2021). Nonetheless, other results from the interview involving several factors become constraints in Computer-Assisted Language Learning (CALL) by smartphones related to improving the English proficiency of Papuan EFL students. By solving all these following constraints, CALL can be much more effective to be implemented in the classroom.

Firstly, the internet network is one of the constraints in CALL. A bad network is an obstacle for students in learning. The technology that aids in studying English still needs to be enhanced. To improve learning objectives, the issue must be resolved by enhancing mobile-based learning media (Nuraeni et al., 2020). This makes students constrained in the learning process. Specifically, it can also be assumed that bad weather conditions related to geographical location determine the good and bad quality of the internet network in Papua. Then, the quality of the network is also determined by whether there is a quota/credits owned by students and the limited Wi-Fi distance that can be accessed in the campus area. An internet network that is slow or inaccessible during teaching has the potential to disrupt the teaching and learning process so that it affects the quality of achieving learning objectives. This is in line with one of the determining factors for the use of CALL in the context of lower technology involving the high cost of the internet and limited internet access (Levy et al., 2011). The geographical location of the campus lies in a mountainous area and far from the capital city, the internet quality is less stable and the economic conditions of students are also at a lower and moderate level. Therefore, the way to solve internet network problems that often occur in CALL by smartphones is to choose English learning applications that do not require a strong internet network or do not require access and internet network at all. Availability of stable Wi-Fi facilities throughout the campus area will be very helpful so that students do not require internet quota anymore to access the internet network.

Secondly, the small display of a smartphone is one of the difficulties in CALL. Through a small smartphone screen, the learning material displayed is automatically small based on device size. Students read more slowly, learn less deeply, recall materials less, and sleep worse when they use screens to study. This is the reason why so many students opt to print their electronic textbooks (Myrberg & Wiberg, 2015). It is difficult for some students to follow the lesson, especially students who have problems with eyesight. The complaint is also about the eyes getting tired. Moreover, it will also have a negative impact on eye health if you look at smartphones for a long period of time. The use of CALL by smartphones has limitations related to small typing keys which result in not being user friendly, small screen display, and low screen resolution (Levy et al., 2011). Therefore, the solution offered to overcome small screens in CALL by smartphones is providing additional devices in the form of LCD projectors that can be connected to smartphones and learning can also be interspersed with conventional learning through boards and books to reduce eye interaction with smartphone screens. For students who have a tablet/pad, it can also be used to display a larger screen with a better resolution.

Thirdly, it is inevitable that when learning English using smartphones, students will always be interspersed with notifications in the form of messages and chats from friends and relatives. Students are distracted and learning is hampered by excessive smartphone use in the classroom (Mahsud et al., 2021). When notifications come in the device, students will be curious and open the contents of the notification. Concentration automatically will disappear for a moment in learning, causing students will be left behind and find it difficult to follow learning. Next, advertisements that often appear in applications often interfere with learning. It is undeniable that some applications are always accompanied by advertisements. In some English applications, the advertisements cannot be closed instantly and students have to wait a few seconds to finish causing the concentration of students in learning will also be disturbed by the advertisement service. There are several factors that hinder the use of CALL in low-technology contexts which include teacher and student constraints, institutional constraints,

physical constraints, and internet constraints (Levy et al., 2011). Notifications and advertising services can be classified as physical constraints which are a challenge in CALL. In this case, to overcome the problem of notifications and advertisements that often appear in CALL, you can set the 'Do not Disturb' mode on your smartphones which can block any notifications, including voice calls and messages from appearing on the smartphones. Furthermore, to avoid advertising services that often appear, it is recommended to use an offline English learning application that does not require an internet network.

Fourthly, some students are confused about operating the English learning application for CALL. This becomes an obstacle in understanding the learning material. Some students are also less proficient and they are not used to using English learning applications via smartphones due to the fact that the learning model has not adapted to the way students learn, unlike conventional learning (Sormunen et al., 2019). However, they begin step by step to adjust and get used to using the English learning application. Language learning using computers provides a solution called teacher-driven computer-based language instruction where students focus on the computer as well as the teacher. The implementation of these instructions can overcome obstacles related to students' lack of proficiency in using smartphone applications in language learning (Kılıçkaya, 2015). Lecturers or instructors must provide a more detailed and comprehensive introduction and understanding of the operation of English learning applications before starting learning materials to minimize confusion and misunderstanding in learning.

Fifthly, some smartphones do not support CALL, specifically constrained by limited random access memory (RAM) capacities, causing not compatible with English learning applications. In fact, some students use smartphones with low process acceleration due to limited RAM resulting in smartphones not being able to follow learning instructions. The challenges were described in teaching and learning issues involving erratic signals, unsupported gadgets, and psychological problems (Annisa et al., 2020). Thus, the material presented cannot be fully understood. Limitations of learning a language using smartphones if the media does not fully support of slow processing aspect and limited storage capacity (Levy et al., 2011). As an instructor or a lecturer in teaching CALL, we cannot guarantee that all smartphones used by students to take part in CALL-based learning have high quality and configuration. Limitations regarding smartphones that do not support or are not compatible can only be solved by replacing smartphones with compatible ones or by sharing smartphones with colleagues so they can follow the learning process properly in the classroom.

Sixthly, another limitation related to the battery power of devices. One barrier to using mobile phones for language learning and acquisition was identified in the study as knowledge or skills (Pengnate, 2018). Some students are constrained by running out of smartphone battery power during the learning process. This obstacle makes students stop and cannot continue learning. Several factors hinder the use of CALL related to low-technology contexts which include teacher and student constraints, institutional constraints, physical constraints, and internet constraints. The problem of lack of smartphone battery power specifically refers to the category of physical constraints (Levy et al., 2011). There are several solutions that students can apply to avoid smartphones running out of power during the learning process involving students can activate the power-saving mode in smartphone features. With this feature, the consumption of smartphone battery power in learning will be more efficient. Students can also minimize the use of battery power by opening only applications or programs related to learning. Then, students can provide electrical expansions chargers or portable chargers so that when the smartphones run out of power in the CALL learning process, they can immediately recharge the smartphones while continuing learning.

Conclusions

Computer-Assisted Language Learning (CALL) by smartphones has proven effective to increase English proficiency of Papuan EFL students by a significant increase of 38.70%. The effectiveness of this learning cannot be separated from the aspects of efficiency, flexibility, and accessibility supported by excellence in terms of visualization and auditory systems.

Furthermore, several factors crucially become limitations of Computer-Assisted Language Learning (CALL) including internet network, small screens, notifications and advertisements, lack of proficiency towards applications, unsupported smartphones, and battery power. By solving all these constraints, it can be more effective to be implemented in teaching and learning. The significant contribution gives better change in the world of education with learning strategies in utilizing technology especially certain context and conditions in Papua. Although this study has followed scientific standards, there are still certain restrictions involving the distribution of the questionnaires and samples in the current study. However, this study is expected to give scientific contributions and additional references for further research.

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