Email: jollt@undikma.ac.id

DOI: https://doi.org/10.33394/jollt.v%vi%i.5808

October 2022. Vol. 10, No. 4 p-ISSN: 2338-0810 e-ISSN: 2621-1378 pp. 570-578

SPEAKING TO DEVICES: CAN WE USE GOOGLE ASSISTANT TO FOSTER STUDENTS' SPEAKING SKILLS?

¹Muhamad Sofian Hadi, ¹Raisya Syafira Junor

¹English Language Education, Muhammadiyah University of Jakarta, Indonesia Corresponding Author Email: raisyasyafira982015@gmail

Article Info	Abstract
Article History Received: Revised: Published:	Teaching speaking skills needs appropriate medias to facilitate students to practice and imitate English speakers accurately. One of applications that can help students learn speaking skills is Google assistant application. This study aims to foster students' speaking skills through the use of the Google Assistant
Reywords Google Assistant; Teaching Speaking; Speaking Skills;	application on devices. This study employed the application to provide students with various speaking materials. This study was designed in an experimental study which was to know whether the use of Google Assistant helps students in fostering their speaking skills or not. This study uses pre-experimental as the research design. The study involved 31 participants of eleventh-grade students in DUA MEI Senior High School, Tangerang Selatan. The data was collected from pre-test and post-test. Based on the analysis, the results show that the t-cal value (12.436) was higher than the t-table (2.042), at the 5% significant level. It indicated that the null hypothesis (H ₀) was rejected and the alternative hypothesis (H ₁) was accepted. Based on the results of the t-test calculation, this study can be concluded that Google Assistant is an effective medium to facilitate students' fostering their speaking skills.

How to cite: Hadi, M. S., & Junor, R. S. (2022). Speaking to Devices: Can We Use Google Assistant to Foster Students' Speaking Skills?, JOLLT Journal of Languages and Language Teaching, 10(4), pp. 570-578. DOI: https://doi.org/10.33394/jollt.v%vi%i.5808

INTRODUCTION

Speaking English is essential to people's lives in this age of globalization. As a result of globalization, English is becoming more frequent. According to the English First Course Center's 2021 English Proficiency Index study on their website said that there are around 2.5 billion English speakers worldwide, including 400 million native speakers. Johnson (2022) as retrieved from the Statista website published that the English language was the common language of online usage, accounting for 25.9 percent of all internet users worldwide. So knowing English allow us access to an amazing amount of information that may not be otherwise available (Kinasih & Olivia, 2022; Anabel & Simanjuntak, 2022). Therefore, the development of speaking abilities is fascinating for students learning English as a Foreign Language (EFL).

Speaking is a type of active or productive skill. Speaking involves multiple aspects, including grammar, strategy, sociolinguistics, and discourse (Chastain, 1998; Hossain, 2015). Further, speaking is more than just producing the appropriate sounds, using the proper words, or using the appropriate structures. It is the most important tool for solving communication problems. In other words, speaking is a crucial skill to master because it enables individuals to move between the speaker and listener roles while efficiently using verbal and nonverbal communication (Br-Bangun & Simanjuntak, 2022; Putri, 2022).

However, teaching and learning to speak English is not an easy task (Pakula, 2019). It takes a lot of effort to learn a new language. Based on the pre-observation in Dua Mei Senior High School, the writers interviewed the English teacher and found that problems commonly faced by students speaking are as follows; the first problem, generally the students live surrounded by an environment where English does not use in their daily conversation so the

students do not have an opportunity to speak English to communicate with others (Dzurotulilmi & Anwar, 2022). Secondly, is the focus on English Learning. The focus of the learning process was always on reading and writing, rather than speaking and listening (Lume & Hisbullah, 2022; Suparlan, 2021). The other problem that affected students' speaking in English was the types of activities provided by the teachers (Syarifuddin et al., 2022). Students struggle to learn to speak in class because the media is typically monotonous and the teacher explains speaking theory or practice that is not enjoyable to the students. Therefore, in order to succeed in learning to speak, those problems that students frequently encounter must be observed.

Nowadays, the advancement of technology affects every aspect that people do in their everyday lives. Emerging technologies such as virtual reality, augmented reality, and voice interaction are transforming digital experiences and reshaping people's interactions with the world (Terzopoulos & Satratzemi, 2019; Hadi, Zaitun, & Suni, 2021). These technological advancements cause people's perspectives to transform, from how they think to how they perform. Technological advancements also have a significant influence on every aspect, from industry to government, and the most important aspect is education.

The advancement of technology is increasingly being used in the context of EFL. For various learning objectives, several learning technologies have been used. For instance, while teaching and learning speaking skills, numerous learning tools are used to improve different aspects of speaking skills. One of the potential advancements of technology to teach speaking skills is Google Assistant. Underwood (2021) explores the educational potential of interactive speaking to machines. Google Assistant is a voice interaction and artificial intelligence tool that can support language learners in having meaningful conversations in the target language and fostering their independence in the language. Artificial intelligence is the capacity of devices to solve problems, respond to questions create plans, adapt to unexpected conditions, and deal with a range of other tasks that call for a level of intellect generally seen in humans (Coppin in Chen et.al, 2020). It indicates that machines might conduct analyses and carry out program-directed actions.

Google Assistant is part of the advancement of information technology (IT) in today's era of globalization. The purpose of Google assistants was to provide as much assistance as possible for activities that are initiated by voice commands (Sarah, 2019). This information may prompt students to pay attention to errors, self-correct, and/or seek assistance. The teacher can also create tasks to assist students in recognizing common sound difficulties such as ship/sheep, cup/cap, whole/hole, or one/want. Furthermore, as of the end of 2019, Google Assistant has over 18,000 voice applications (Kinsella, 2020). This program operates with a natural-speaking voice, which means it will be helpful for English language learners and may be used to foster speaking skills. This is crucial for students who can't practice speaking English with native speakers outside of the classroom. The best medium for learning to talk is Google Assistant, for this reason.

A study by Tai & Chen (2020) found that using Google Assistant significantly improved EFL students' communicative confidence, willingness to communicate (WTC), and speaking anxiety. Participants did enjoy interacting with chatbots and playing games with Google Assistant, which, according to the interview analysis, made them feel less anxious and motivated to have real, meaningful discussions in English. Although many of us do not have a voice assistant in our homes or pockets, but it is predicted that this technology will become more common in the next few years. Using the free Google Assistant app for Android or iOS devices, students may connect with their virtual assistants through interactive speaking games and conversations. With the help of this app, students should be able to quickly practice speaking English anywhere, at any time. It is expected that the more they use their devices to speak English, the more phrases or words they would create so that they can foster their

speaking skill. Based on the explanation above, some methods could be used to teach Speaking Therefore, the writers was interested in the use of teaching speaking skills to students of senior high school. The writer was interested in conducting a research entitled "Speaking to Devices: Can We Use Google Assistant to Foster Students' Speaking Skills?"

RESEARCH METHOD

Research Design

The writers use quantitative research with a pre-experimental design that focuses on one group pre-test and post-test. Quantitative research is research that involves a systematic process, the scientific method, to build knowledge (Neely-Barnes, S. & Lennon-Dearing, R, 2020). To understand, predict, and/or regulate interesting phenomena, quantitative research approaches collect numerical data. One group indicates that only one class was used for the study testing while pre-test and post-test work to measure the success study. Therefore, neither the control group nor group comparison was used for measurement.

To conduct this research the writers used 8 meetings. The first meeting was used to collect the pre-test data. The pre-test was aimed to see the students' speaking skill before the treatment. On the treatment, the students of the experimental group received treatment using Google Assistant which the students can use to practice their speaking English with Google Assistant using their devices. And for the last meeting, the students get the post-test to see the improvement of the students' speaking skills after the treatment.

In this pre-experimental design, researchers use one experimental group covering pretest, treatment, and post-test. A variable is one of the characteristics that can be measured and recorded on the instrument, and it changes in different values or different people's scores. There are two types of variables; namely independent variable (X) and dependent variable (Y). In this study, the independent variable (X) is chosen and controlled by the writer, and the dependent variable (Y) is the variable examined to determine the impact of the independent variable (X). The independent variable (X) of this study is Google Assistant and the dependent variable (Y) of this study is students' speaking.

Population and Sample

The population in this research is 11th-grade students of SMA Dua Mei in the academic year 2022/2023. In this school, there are three classes of 11th-grade students that consist of two major, two social classes, and one science class with a total of the population is 105 students. The sample of this research was 31 students from an 11th-grade science class in SMA Dua Mei. There are 16 female students and 15 male students in this class. These students participated in this study from the beginning to the end. In doing this study, the writers used one class only choosing through a cluster random sampling technique. The class was the experimental group of this study.

Instruments

The instrument used in this study was the speaking test. A speaking test was conducted to measure how fluent and accurate the students speaking ability. Students get an interview with the writer for 5 minutes each student, each student gets 10 questions based on the topic and students must answer the questions properly and correctly by speaking in English. Students' speaking skills will be assessed based on indicators; Pronunciation, Fluency, Vocabulary, Grammar, and Comprehension (Hughes, 1999; Rahmah, 2016).

Data Analysis

The data of this study consisted of students' scores from students' speaking tests. Based on the results of tests, the students' speaking achievement in pre-test and post-test was computed. Thus, the two data were analyzed statistically. To find out the significant differences between students' scores of the pre-tests and post-tests, this study used Paired

100%

Total

Sample T-Test as a data analysis technique, and the data was analyzed by IBM SPSS Statistic version 25. This test aimed to determine whether there are differences between the result of the students' pre-test and post-test scores.

RESEARCH FINDINGS AND DISCUSSION

Research Findings The result of pre-test and post-test was distributed based on the classification of students' achievement by Farhan (2020). It was shown in the following table:

Table 1

Value	Level of Achievement -	Pre	e-test	Post-Test		
		Frequency	Percentage	Frequency	Percentage	
90 - 100	Excellent	0	0%	4	13%	
76 - 89	Good	3	10%	15	48%	
66 - 75	Enough	18	58%	11	36%	
40 - 65	Poor	10	32%	1	3%	
0 - 39	Very Poor	0	0%	0	0%	

100%

Classification on the Students' Score in Pre-test and Post-Test

From table above, it showed the students' score achievement on the pre-test and the post-test done by XI MIPA. In the pre-test, the majority of the students were categorized as enough, with (58%) of the total students falling into this category, and also followed categorized as poor with 10 students (32%). And there were 3 students got categorized as good (10%). From the result above, there are still many students had a low speaking skills. And in the post-test, there was 1 student categorized as poor (3%). There were 11 students who got good and enough results (36%). There were 15 students who got the good result (48%). And there were 4 students got the excellent result (13%). The research findings of the pre-test and the post-test were discribed in the form of chart, it was presented as follows;

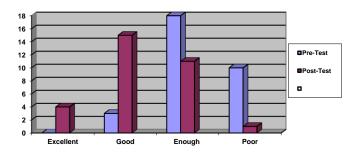


Figure 1. Diagram of Frequency Distribution of Pre-Test and Post-Test

To test the data above, the writer used several stages using the SPSS statistical formula to determine the mean, median, and mode. The result of the statistic data was in the table below;

Table 2 Descriptive Statistic

N		Minimum	Maximum	Mean	Std. Deviation	
Pretest	31	53.00	80.00	67.5806	6.55629	
Posttest	31	56.00	96.00	78.3226	8.68864	
Valid N (listwise)	31					

The researchers found that the mean of pre-test score was 67.58 while the mean of post-test score was 78.32. The median of pre-test was 70.00 and the median of post-test was

80.00. The mode of pre-test was 70 and the mode of post-test was 73. The standard deviation of pre-test was 6.55 while the standard deviation of post-test was 8.68.

In answering the hypothesis, the writers used test of hypothesis. In testing the normality of the data, the writers used IBM SPSS 25 by applied Kolmogorov-Smirnov normality test. The computation of normality test using IBM SPSS 25 can be seen in the table below;

Table 3 Test of normality Kolmogorov-Smirnov

One-Sample Kolmogorov-Smirnov Test					
		Unstandardized Residual			
N		31			
Normal Parameters ^{a,b}	Mean	.0000000			
	Std. Deviation	4.75603461			
Most Extreme Differences	Absolute	.118			
	Positive	.109			
	Negative	118			
Test Statistic		.118			
Asymp. Sig. (2-tailed)	.200 ^{c,d}				
a. Test distribution is Norma	l.				
b. Calculated from data.					
c. Lilliefors Significance Cor	rection.				
d. This is a lower bound of the	ne true significance	· ·			

According to Field (2012: 182), the data can be said normal if the significance value is higher than significance level (> 0.05). Then, the data can be said abnormal if the significance value is lower than significance level (< 0.05). The computation above showed in the Kolmogorov-Smirnov column that the significance value of the tests was 0.200, that is mean the significance values were higher than 0.05. Therefore, it can be concluded that both data of the pre-test and post-test are in normal distribution.

After found out that the data distribution was normal, the writers computed the test of hypothesis using IBM SPSS 25 by applied t-test. The result of t-test was can be presented in Table 4 as follows.

Table 4 Paired sample test

Paired Samples Test								
		Paired	Std.	Std.	95% Confidence		df	Sig. (2
		Differences	Deviation	Error	Interval of the			tailed)
				Mean	Difference			
					Lower	Upper		
Pair 1	Pre-test-	-10.74194	4.80949	.86381	-	-	30	.000
	posttest				12.50607	8.97780		

From the Table 4, the writers found that the sig. (2 tailed) values was 0.000. The writers used 5% (0.05) significance level. Moreover, the two sided significance value was lower than 0.05 (0.000). The results also showed that the t-cal value (12.436) was higher than the t-table (2.042), at the 5% significant level. Based on the hypothesis testing, the H₁ was accepted while the H₀ was rejected. The writer had a conclusion that the use of Google Assistant was effective to foster students' speaking skills.

Discussion

This study was oriented to examine the effectiveness of Google Assistant applications to foster students' speaking skills for senior high school students. The students are provided with learning media, that is Google Assistant applications on their devices. In this study, Google Assistant was integrated to promote learning activities in learning to speak English. The result of the pre-test showed that the ability of students in speaking English is still very low. They were hesitant to express their thoughts and ideas. In addition, they are also they also seemed shy and not fully interested when practicing speaking. By contrast, after implementing Google Assistant on the students, the result of the post-test showed the students feel more comfortable and confident. Also, they really enjoy speaking English without any hesitation or are afraid of making a mistake. It is in line with Tai & Chen (2020) that using Google Assistant significantly improved EFL students' communicative confidence, willingness to communicate (WTC), and speaking anxiety.

In addition, by using this application for learning to speak, students also find this type of activity can motivate them to speak. There are a lot of features that the students can access on this app including games. In speaking activities, students are involved in various speaking activities to train students in pronunciation and accuracy. Providing students with various speaking activities can improve students' speaking skills (Baiq Sumarni et al., 2022; Jupri et al., 2022). The finding is also similar to Tai & Chen (2020) that participants did like having a conversation with chatbots and playing games with Google Assistant, which helped them feel less anxious and motivated to conduct actual, meaningful conversations in English. This application uses native speakers as the voice system, so students can easily have conversations with their devices, considering that many of the students do not have the opportunity or are embarrassed or shy to practice their English with native speakers or English speakers at a high level. This is also in line with Underwood (2017) and Tai & Chen (2020) in human-machine interaction, there was a lack of an open, public interest, which made learners feel less embarrassed. Finally, a few introverted participants thought that Google Assistant helped them become more interested and engaged in group discussions by increasing their English performance.

The efficacy of using Google Assistant applications was effective in fostering students' speaking skills. It is proven by the result of students' achievement in which the value of the tcal (12.436) was higher than the t-table (2.042) in the degree of the significance level of 5%. It means the alternative hypothesis (H₁) was accepted while the null hypothesis (H₀) was rejected. Thus, it can be concluded that the Google Assistant have a positive effect on students' speaking skills at the eleventh-grade students of SMA Dua Mei in the academic year of 2022/2023. The other writers can use the theoretical basis of this study to carry out other studies dealing with Google Assistant.

From the explanation above, the implementation of Google Assistant in teaching and learning process gives a positive effect on the students' speaking skills achievement, because they can learn how to speak English more easily and relax without any burden. It can be done because by the new learning speaking media for them, information can be understood and maintained well. The description above implies that the Google Assistant help them a lot in practicing how to speak English fluently and accurately in any situation for the learner, so that they can learn better. Consequently, they can improve their speaking skills through the implementation of the Google Assistant.

CONCLUSION

After presenting and analyzing data previously, the writers concluded that Google Assistant can foster students' speaking skills. It can be seen from the students' improvement between pre-test and post-test. Based on research in class eleventh-grade students of SMA Dua Mei, it can be concluded that Google Assistant can influence students in speaking skills.

This can be seen from the student's process of fostering students' accuracy and fluency in speaking. Student progress can be seen from the results of the student pre-test and post-test, student pre-test results (67.58), and student post-test results (78.32). This means that the students' speaking skills increased, and their post-test scores are higher than their pre-test scores. It also shows that when the sign is 5%, the t-cal was higher than the t-table. If the t-cal result is higher than the t-table level, then the alternative hypothesis is accepted, and the null hypothesis is rejected. Based on the results of the t-test calculation above, because of the acceptance of the alternative hypothesis, it can be said that learning activities using Google Assistant can foster students' speaking skills.

REFERENCES

- Aleksandrzak, M. (2011). Problems and challenges in teaching and learning speaking at advanced level. Glottodidactica. An International Journal of Applied Linguistics. 37. 37-48. https://doi.org/10.14746/gl.2011.37.3
- Anabel, T., & Simanjuntak, D. (2022). Obtaining Preferences from a Hybrid Learning System to Promote English-Speaking Ability through Focus Group Discussion. Journal of Languages and Language Teaching, 10(2),118-133. doi:https://doi.org/10.33394/jollt.v10i2.4994
- Bahadorfar, Maryam & Omidvar, Reza. (2014). Technology In Teaching Speaking Skill. *International Journal of Multidisciplinary Research Review*, 2, 9-13.
- Br Bangun, H., & Simanjuntak, D. (2022). The Effects of Vocabulary Mastery on English-Speaking Ability: A Meta-Analysis Study. Journal of Languages and Language Teaching, 10(2), 211-222. doi:https://doi.org/10.33394/jollt.v10i2.4995
- Baiq Sumarni, Dharma Dev Bhatta, & Kho, S. F.-C. (2022). The Use of Total Physical Response in Teaching Vocabulary Integrated with Meaningful Classroom Interaction. Journal Language and Literature Studies, 2(1),23–32. https://doi.org/10.36312/jolls.v2i1.710
- Chaney, A.L., and T.L. Burk. (1998). *Teaching Oral Communication in Grades* K-8. Boston: Allvn & Bacon.
- Chastain, K. (1998). Developing second language skills (2nd Ed.). Chicago: Harcourt Brace Publishers.
- Creswell, J. W. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th Ed.). Boston, MA: Pearson Education, Inc
- Dizon, G.; Tang, D.(2020). Intelligent personal assistants for autonomous second language learning: An investigation of Alexa. The JALT CALL Journal, 16(2),107-120, DOI: 10.29140/jaltcall.v16n2.273.
- Djumanova Barno, D. B. (2021). Methods for Teaching Speaking Skills In Modern Pedagogy. Журнал иностранных языков лингвистики,2(5),1-5. u https://journal.jspi.uz/index.php/fll/article/view/1112
- Dzurotul Ilmi, P., & Anwar, K. (2022). Students' Perception of Total Physical Response Method in Teaching English Vocabulary at Ban Nonsawan School, Thailand. Journal of 266-275. Languages and Language Teaching, 10(2),doi:https://doi.org/10.33394/jollt.v10i2.4989
- Guo, Meng (2020). Advantages and Disadvantages of Artificial Intelligence In Business English Teaching. International Conference on Educational Innovation and Teaching Methodology, 115-120.
- Hadi, M., Zaitun, Z., & Suni, T. (2021). Creative Story through 9GAG Application in Teaching Speaking. Journal of Languages and Language Teaching, 9(2), 170-178. doi:https://doi.org/10.33394/jollt.v9i2.3534

- Hidayatullah, H., Munir, S., & Tawali, T. (2022). Enhancing Vocabulary Mastery through Applying Visual Auditory Kinesthetic (VAK): A Classroom Action. Journal of Language and Literature Studies, 2(1), 43–52. https://doi.org/10.36312/jolls.v2i1.721
- Hossain, M.I. (2015). Teaching Productive Skills to the Students: A Secondary Level Scenario. *BRAC University*. 1-83. http://hdl.handle.net/10361/7671
- Hughes, Arthur. 1999. Testing for Language Teachers. Melbourne: Cambridge University Press
- Jupri, J., Mismardiana, Muslim, & Haerazi, H. (2022). Teaching English Using Two Stay Two Stray in Improving Students' English Speaking Skills Integrated with Foreign Language Anxiety. Journal of Language and Literature Studies, 2(1), 33–42. https://doi.org/10.36312/jolls.v2i1.719
- Kinasih, P., & Olivia, O. (2022). An Analysis of Using Movies to Enhance Students' Public Speaking Skills in Online Class. *Journal of Languages and Language Teaching*, 10(3), 315-328. doi:https://doi.org/10.33394/jollt.v10i3.5435
- Kinsella (2020, January 19). *Google Assistant Actions Grew Quickly in Several Languages in 2019, Matched Alexa Growth in English.* Retrieved March 4th 2022 from https://voicebot.ai/2020/01/19/google-assistant-actions-grew-quickly-in-several-languages-in-2019-match-alexa-growth-in-english/.
- Lume, L., & Hisbullah, M. (2022). The Effectiveness of Task-Based Language Teaching to Teach Speaking Skills. *Journal of Languages and Language Teaching*, 10(1), 85-93. doi:https://doi.org/10.33394/jollt.v10i1.4399
- L. Chen, P. Chen and Z. Lin (2020) Artificial Intelligence in Education: A Review. *IEEE Access*, 8, 75264-75278. doi: 10.1109/ACCESS.2020.2988510.
- Neely-Barnes, S. & Lennon-Dearing, R. (2020). Quantitative Research. In L. Roussel, T. Taylor-Overholts, & H. R. Hall (Eds), *Evidence-based practice: An integrative approach to research, administration, and practice* (3rd ed.). Sudbury, MA: Jones and Bartlett.
- Pakula, H.-M. (2019). Teaching speaking. *Apples Journal of Applied Language Studies*, 13(1), 95–111. https://doi.org/10.17011/apples/urn.
- Putri, W. (2022). Exploring Students' Experiences of Task-Based Language Teaching (TBLT) in Vocabulary Learning: A Narrative Inquiry. *Journal of Languages and Language Teaching*, 10(2), 302-308. doi:https://doi.org/10.33394/jollt.v10i2.4935
- Rahmah, Muthia (2016). The Effectiveness of Using Audio Lingual Method in Teaching Speaking to the Eight Grade At MTSN Padang Tarab, 1-62.
- Richards, Jack. C. (2015). Teachnology in Language Teaching Today. *Indonesian Journal of English Language Teaching*, 10(1), 18-32.
- Salsabila, S.D. (2018). Attributions on Students' Speaking Fluency in an EFL Speaking Classroom. 8-32
- Sarah (2019, April 14). *Can you use voice assistants to practise speaking English?*. Retrieved January 15, 2022 from, https://oh-yeah-sarah.medium.com/can-you-use-voice-assistants-to-practise-speaking-english-f2cb679941ee.
- Sosas, R.V. (2021). Technology in teaching speaking and its effects to students learning English. *Journal of Language and Linguistic Studies*, 17(2), 958-970. 10.52462/jlls.66.
- Suparlan, S. (2021). Factors Contributing Students' Speaking Anxiety. *Journal of Languages and Language Teaching*, 9(2), 160-169. doi: https://doi.org/10.33394/jollt.v9i2.3321
- Syarifuddin, M. ., Muhlisin, M., & Thinh, V. T. (2022). Suggestopedia-Based Language Learning to Enhance Students' Speaking Skills Viewed from Teachers' Educational Background. Journal of Language and Literature Studies, 2(1), 12–22. https://doi.org/10.36312/jolls.v2i1.709

- Terzopoulos, George & Satratzemi, Maya (2020) Voice Assistants and Smart Speakers in Everyday Life and in Education. Informatics in Education, 19(3), 473-490. DOI: 10.15388/infedu.2020.21
- Tzu-Yu Tai & Howard Hao-Jan Chen (2020): The impact of Google Assistant on adolescent EFL learners' willingness to communicate, Interactive Learning Environments, 1-19. https://doi.org/10.1080/10494820.2020.1841801
- Underwood, J. (2021). Speaking to machines: motivating speaking through oral interaction with intelligent assistants. In T. Beaven & F. Rosell-Aguilar (Eds),. Innovative language pedagogy report ,127-132. https://doi.org/10.14705/rpnet.2021.50.1247
- Underwood, J. (2017). Exploring AI language assistants with primary EFL students. In K. Borthwick, L. Bradley, & S. Thouësny (Eds.), CALL in a climate of change: Adapting to turbulent global conditions - short papers from EUROCALL 2017. Researchpublishing.net.