



Problem-based Learning using Scribblenauts Unlimited for Teaching English at Vocational High School

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ABSTRAK

Di sekolah-sekolah negeri Indonesia, bahasa Inggris diajarkan dan dipelajari semata-mata sebagai bahasa asing. Hal ini berdampak pada kurangnya kemampuan siswa dalam bahasa Inggris sehingga diperlukan strategi dan media pembelajaran yang sesuai. Penelitian ini bertujuan untuk menganalisis pengaruh signifikan penerapan PBL dengan model tujuh langkah Maastricht menggunakan video game Scribblenauts Unlimited terhadap prestasi belajar bahasa Inggris siswa kelas XI. Penelitian ini menggunakan metode penelitian quantitative dengan desain pra-eksperimental, interview, dan survei. Sampel penelitian ini adalah 27 siswa kelas 11 dan seorang guru bahasa Inggris kelas XI. Pengumpulan data dilakukan melalui pretest-posttest berisi 20 soal pilihan ganda dan 5 soal uraian serta angket dan wawancara. Data yang diperoleh dianalisis secara deskriptif dan inferensial. Hasil uji-t sampel berpasangan menunjukkan bahwa skor rata-rata setelah diajarkan dengan menggunakan video game Scribblenauts Unlimited ($Me = 64,67$) lebih tinggi daripada sebelum diajarkan dengan menggunakan game ini ($Me = 51,92$) dengan ukuran efek Cohen's d yang besar ($1,35 > 0,80$). Para siswa merasa senang untuk belajar bahasa Inggris. Pendapat guru bahasa Inggris positif dan sangat mendukung penerapan PBL menggunakan video game Scribblenauts Unlimited ini pada kelas bahasa Inggris di SMK.

ABSTRACT

In Indonesian public schools, English is taught and studied solely as a foreign language. This has an impact on the lack of students' English skills so that appropriate learning strategies and media are needed. This study aims to analyze the significant effect of implementing PBL with the Maastricht seven-step model using the Scribblenauts Unlimited video game on the English learning achievement of grade XI students. This study uses a quantitative research method with a pre-experimental design, interviews, and surveys. The sample of this study was 27 grade 11 students and an English teacher of grade XI. Data collection was carried out through a pretest-posttest containing 20 multiple-choice questions and 5 essay questions as well as a questionnaire and interview. The data obtained were analyzed descriptively and inferentially. The results of the paired sample t-test showed that the average score after being taught using the Scribblenauts Unlimited video game ($Me = 64.67$) was higher than before being taught using this game ($Me = 51.92$) with a large Cohen's d effect size ($1.35 > 0.80$). The students were happy to learn English. The English teachers' opinions were positive and strongly supported the implementation of PBL using the Scribblenauts Unlimited video game in English classes at vocational schools..

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1. INTRODUCTION

In today's era, the English language is very important to be taught because English is the greatest common language spoken universally. Around 1.35 billion people worldwide spoke English natively and as a second language and as a foreign language in 2021 (Jubaerudin et al., 2021; Sofyan et al., 2023). Therefore, English is used in almost every aspect of life, especially in technology and science development. English's rise as a World language is now undeniable. Previous study argued that the spread of English enabled unrestricted access to the modern worlds of science, information and communication technology (ICT), money, power, international communication, and intercultural understanding, as well as entertainment and a variety of other fields (Nunan, 2020). This makes the digital native generation either natively or as a second language or foreign language around the globe must learn English, including in Indonesia. According to EPI (English Proficiency Index) report, Indonesia earned a score of 466 and a rank of 80 out of 112 countries, which places us 14th out of 24 countries in Asia (Waluyo, 2019). In recent years, Indonesia's ranking has tended to deteriorate gradually. Indonesia was rated 32nd in 2016 with an intermediate range of competence and fell to 80st in 2021. As previously mentioned, it continued to decline in 2021, eventually falling to the 80th position, which is considered to be in the low range of

proficiency. In Indonesian public schools, English appears to be taught and learned solely as a foreign language. This means that most English learning and teaching takes place in classrooms rather than in everyday communication. In Indonesia, English students do not have easy access to using English to communicate outside of the classroom. As a result, English language teaching and learning in Indonesia faces unique obstacles that are not encountered in nations like India, where English is more widely spoken (Hidayatullah et al., 2021; Mutohhari et al., 2021). This supports by study who states that English in Indonesia is a compulsory subject, which implies that students must learn the language for examination purposes. As a result, students have poor motivation because it is less engaging (Sulistiyo, 2016). Thus, according to other study the EFL teacher in such a country is required to fulfill two responsibilities at once: teaching English and making the teaching-learning process as engaging as possible so that students are motivated to learn (Tanjung & Ashadi, 2019). Here, teacher creativity and critical thinking to choose the method, strategies, and teaching media is very urgent.

Besides that, the 21st-century education system is expected to go hand in hand with technological developments to meet the demands of the sophisticated characteristics of the digital native generation, in this case, 21st century- students. The digital immigrant generation must adapt and begin to open up space for new things related to technology in the classroom. Because digital natives are media savvy, they benefit from a diversity of instructional delivery regardless of content to better suit their requirements (Miner-Romanoff et al., 2019; Rehmat & Hartley, 2020). Teachers may improve their educational environment by reaching these students through interactive experiences that inspire and actively involve them in the learning process (Ansarian & Shafiei, 2016; Ghufron & Ermawati, 2018; Mercy, April Lapuz; Fulgencio, 2020; Seibert, 2021). This indicates that there must be a change or modification of teaching strategies to fit the 21st-century students' characteristics. The too-formal class, textbook-oriented teaching, and less-engaging media are old options that must be left behind and replaced by suitable things related to technology so it is suitable with the 21st century characteristics.

On the other hands, the purpose of teaching 21st-century skills to students is to "develop their ideas", test and share those ideas, and incorporate feedback from their teachers and peers to further develop their ideas (Nurrohma & Adistana, 2021; Rahman, 2019; Seibert, 2021). This type of teaching and learning is best reflected in the Problem-Based-Learning (PBL) method. PBL is an educational method that exaggerates actual learning opportunities for students, with an emphasis on teaching through real-world scenarios and problem-solving (Ali, 2019; Lapek, 2018; Suwastini et al., 2021). To add, the Ministry of Education and Culture of Indonesia has established the regulation (Permendikbud No. 22 Year. 2016) that recommends PBL as a basis for learning activities in order to achieve the domains of cognitive, affective, and psycomotor in accordance with the characteristics of the 21st century, such as the abundance of information, computation, automation, and freedom of communication. This method covers the 21st-century students' demands as self-regulated people; must have problem-solving skills, critical thinking, creativity, collaboration, communication, and digital literacy (Mutohhari et al., 2021; Othman & Shah, 2013; Seibert, 2021).

Despite fitting with students' characteristics, the teaching strategies also should be fun, engaging, and technology-based. One interesting option to research is the use of video games. There is growing evidence to support the belief that video games may be excellent learning tools in the language-learning as a means of creating more dynamic and exciting classrooms (Admiraal et al., 2011; Kirschner & Williams, 2014; Plass et al., 2015). Given the high levels of involvement and language exposure inherent in gameplay, a recent study suggests that students can enhance their reading, writing, and listening abilities by playing the video game (Qasim, 2021; Saputri et al., 2018). In addition, video games aid in the development of learner autonomy by providing a sense of realism, greater motivation, student-centeredness, cultural affiliation, and anxiety reduction (Barreto et al., 2017; Cornillie et al., 2012; Galvis, 2012). Besides the numerous video games available, one of the games that should be considered for use in the world of education, especially TEFL is Scribblenauts Unlimited (Vásquez & Ovalle, 2019). The use of Scribblenauts Unlimited video games in language learning classrooms is justified because this game is classified as a COTS (Commercial Off the Shelf) video game that can be used for educational purposes.

The combination between the PBL method and Scribblenauts Unlimited video game become a silver lining as teaching strategies that is adored by the student, technology-based, and meaningful. However, the implementation of PBL using this game has never been utilized for teaching English in Indonesian vocational public school. Therefore, the effect of the implementation is very interesting to be studied. Scribblenauts unlimited video game had been utilized in several TEFL and TESL research in different topics, grades, and places. However, in the context of teaching English as a foreign language in Indonesian vocational public schools, the implementation of the PBL method with Maastricht's seven-step model through Scribblenauts Unlimited video game had never been done so far. So, the effect of this game on English teaching at SMK Negeri 1 Sawan with the PBL approach is worth finding out.

2. METHOD

This study applied embedded mixed method QUAN → qual including pre-experimental design and focus group design (RQ₁), and survey research design (RQ₂) (Dolmans et al., 2005). This study aimed to find out whether there is significant effect between before and after being taught by using Scribblenauts Unlimited video game on 11th-grade students' English learning achievement at SMK Negeri 1 Sawan and also dig the English teacher's opinions about that implementation. This study was participated by 27 11th-grade students of AKL 2 class and an English teacher of XI AKL 2 class at SMK Negeri 1 Sawan in the 2021/2022 academic year. There were four instruments used during the research, that was, pretest-posttest which includes 20 MCTs and 5 essays related with asking and giving opinion & suggestion topics, open-ended questionnaire which includes 10 questions, six-scales Likert-type questionnaire which includes 20 statements, semi-structured interview which includes 5 questions. The framework of research method can be seen on Figure 1.

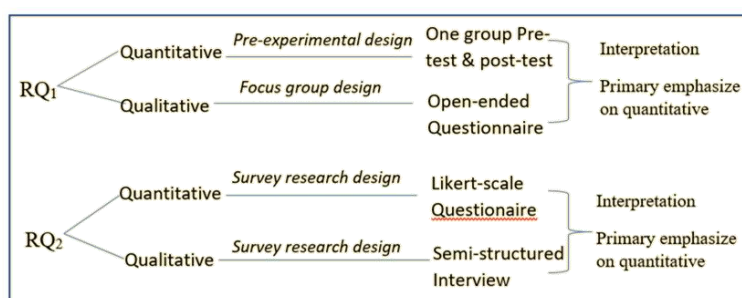


Figure 1. The Framework of Data Collection Methods

The pre-test and post-test instrument is repeated test. As a result, a kind of repeated measures statistical test to analyze the data is highly needed. With a fair amount of consideration, the researcher decided to statistically analyze the pre-test and post-test data with parametric difference test on paired quantitative data analysis technique, that is, paired T-test with two-sample dependent case. Because the paired sample t-test is part of parametric statistical analysis, the main requirement is that the research data must be normally distributed. Therefore, before analyzing the data with paired sample t-test, the researcher made sure if the data had normal distribution result based on tests of normality of Shapiro-Wilk. Then, descriptive statistics are used to characterize the fundamental characteristics of data. It gives quick summaries of the sample and measures. The descriptive statistics used in this study included mean, median, mode, range, variance, and standard deviation. Besides that, the Likert-type questionnaire outputs were analyzed on an interval measurement scale. The method of data analysis for interval scale items was descriptive statistics, in this case the researcher used frequency analysis to seek informative and summarized data sets. Frequency analysis provided categorical information on number of occurrences of the chosen Likert-scale in each respondent's answers. In addition, each qualitative instrument data were analyzed by using coding data analysis technique (Miles et al., 1994).

3. RESULT AND DISCUSSION

Result

In this topic, the data from the applied instruments were evaluated with several data analyses explained in the previous chapter and brought up altogether to be reviewed to discover each problem in this research. The students' English learning achievement between before and after being taught by using Scribblenauts Unlimited video game were analyzed using paired sample t-test and also Cohen's *d* effect size using SPSS v.26.00. The paired sample test is show in Table 1.

Table 1. Paired Sample Tests

Test	Mean	N	Mean Difference	Std. Deviation	Std. Error Mean	t	Sig. (2-tailed)
Pretest Score	51.92	27	12.75	11.64	2.24	7.031	.000
Posttest Score	64.67	27		9.51	1.83		

According to the result from paired samples t-test from Table 1, the researcher got the mean values of pretest (51.92) and the posttest (64.67) with 12.75 points of difference. When the t-test analysis was administered, it showed that the t_{count} was 7.031. It can be interpreted that there was significant effect between before and after

being taught by using Scribblenauts Unlimited on students' English learning achievement. Moreover, the Cohen's *d* result indicated the large effect ($1.35 > 0.80$) as shown in the *Figure 2* below. In the effect size test, which uses the results of the pre-test and post-test on 27 eleventh grade AKL 2 students, the Cohen's score showed a result of 1.3524416136 which it was higher than 0.80 (>0.80). Based on Cohen's effect size level criteria, it proven that using Scribblenauts Unlimited video games has a high effect on students' English learning achievement.

Mean (post-test)	Mean (pre-test)
64.67	51.92
SD (post-test)	SD (pre-test)
9.42	9.42
Compute	
Cohen's <i>d</i>	Effect-size <i>r</i>
1.3524416136	> 0.80

Figure 2. The Effect Size

Besides, based on the open-ended questionnaire answers, there were strong reasons behind the improvement of pretest and posttest scores that depicted the students' English learning achievement. The first reason, it was because the students enjoyed the learning activities with Scribblenauts Unlimited video game, they were happy, excited, and motivated. The second reason, it was because the students sometimes felt they were not studying, in fact they were studying while playing the game especially while gaining the new vocabulary. The third reason, it was because the use of this video game in the classroom with maastrich seven step model could push them to think critically to solve related problem without making them feel forced. According to the findings for English teacher's opinion, the chosen scales were Agree and Strongly Agree. The English teacher chose to Agree for several statements, such as 5th, 6th, 9th, 11th, 13th, and 19th statements and he chose Strongly Agree for the rest of the statements. It can be concluded that the English teacher had positive perspectives toward the implementation of the Scribblenauts Unlimited video game in English class. In addition, these findings were strengthened and complemented by the findings from the semi-structured interview. Here, the researcher interviewed the English teacher by asking 5 questions about the learning activities in this research. He witnessed and observed the class while this research was conducted. As a discussion, the researcher got the mean values of pretest (51.92) and the posttest (64.67) with 12.75 points of difference. Moreover, the Cohen's *d* effect size results indicated the large effect ($1.35 > 0.80$). Those findings implied that the $H_0 (X_1 > X_2)$ is rejected. So, there was a significant effect before and after being taught using Scribblenauts Unlimited video game on eleventh-grade students' English learning achievement. Although the score showed improvement, only a few of the students got 'good' score, and for the rest only got 'enough' score and 'not enough' score from the standard score criteria for English subject that was 75. It was pretty understandable because the test required high-order thinking skills that might be a little bit different from the common test about asking and giving opinion & suggestions. The test also depicted how well the students' problem-solving and critical thinking skills were besides giving effect to the reading skills and vocabulary mastery.

In addition, the significant effect earned from the mean scores differences had underlying reasons based on the students' perspectives in answering the open-ended questionnaire. The students were engaged to learn English with Scribblenauts Unlimited because they were happy, excited, and motivated while studying and playing this game using Maastricht's seven steps. Furthermore, the students gained a lot of new vocabulary while playing this game in the form of verbs, nouns, and adjectives. Surprisingly they felt that they were not studying, in fact, they were studying while playing this game. Moreover, the Maastricht seven-steps model pushed them to think critically to solve the related problems without making them feel forced. They felt it was challenging but also addicted to every challenge due to the competitive atmosphere. Those were the reason based on the students' perspective and experiences about why their English learning achievement improved.

Discussion

On the other hand, the researcher also gained an English teacher's perspective on the implementation of PBL through Scribblenauts Unlimited video game. His opinions were so positive and he chose only Agree and Strongly Agree to the statements (Pourhosein Gilakjani & Sabouri, 2016; Razali & Razali, 2013). To seek a more

detailed explanation, he was interviewed. Overall, his answers were positive because he supported PBL using *Scribblenauts Unlimited* due to the attractive gameplay and the Maastricht seven-steps model which was related to the HOTS (high order thinking skill) (Pertiwi, D & Sudarsono, A, 2015; Valizadeh, 2021). And he saw that the students enjoyed, engaged, and were motivated to learn English during the activity. From the significant difference in pretest-posttest mean score, students' perspectives as well with the English teacher's perspectives, it seemed that the theory of player satisfaction (B. Watson et al., 2015), player engagement (Kirschner & Williams, 2014), flow (Admiraal et al., 2011), and player personal development (Adachi & Willoughby, 2017) while playing the game influenced and affected the students' English learning achievement. Yet, the model and also the approach were indeed so important to be the main concept, and the video game here roled as a media to run that concept. They were a unity that worked together and cannot be separated (Grabe & Stoller, 2013; John & Geoff, 2013; Razali & Razali, 2013).

Furthermore, the theory of digital generation and its complex different characteristics were related to the findings. As what had been mentioned in Chapter 2, the characteristic of digital native students nowadays were sophisticated. They adored a dynamic teaching style, the use of technology, and a less-boring class. Mainstream and monotonous activity in the classroom seemed to become a catalyst of demotivation among students to love English subjects. Therefore, when the researcher gave them a new experience and atmosphere to the class by teaching in PBL approach with Maastricht 7 Step model through *Scribblenauts Unlimited* video game, the students were so excited and interested to learn. They thought it was challenging and very competitive (Meijer et al., 2013; Vásquez & Ovalle, 2019). It made them not lazy to search for the meaning of new English vocabulary with the conventional dictionary as fast as possible. Importantly, the gameplay in the *Scribblenauts Unlimited* video game which is audiovisually attractive made them enjoy and focus on the game and the English words appeared because it was the clue to solve the NPC's problem in the game as a phase in the design Maastricht 7 steps model.

As the interpretation, this study depicted how well the PBL method is adored by the students of the millennial generation as if it is covered with suitable media, like video games. The fun media roles as the catalyst to gain the students' engagement to be comfortable in an English class using the PBL method which needs critical thinking that may make them overwhelmed due to being tired of thinking. Now, the thing is how the students can enjoy the learning activities while thinking so hard. That is when the fun media like video games are needed. Because, interactive experience while learning using video game can inspire and actively involve the students nowadays in the learning process (Fadillah & Maryanti, 2021; Hoffman & Nadelson, 2010; Sudarmaji & Yusuf, 2021; Vásquez & Ovalle, 2019).

This has been demonstrated in the treatment phase of this study. By presenting the problems in the *Scribblenauts* game as a challenge to be the best, the students became very enthusiastic to compete and come up with the best ideas with the existing rules. The rules here must be designed as subtle as possible so as not to sound threatening or frightening in the minds of students. The rule is to embed the must for the entire group to pass the Maastricht seven steps which is a model of the PBL method. From the process of clarifying unfamiliar terms, defining problems, brainstorming, analyzing, formulating learning objectives, self-study, and reporting, they must conquer the 7 steps to overcome the problems in the game. Even though they had to think extra hard, they didn't feel that this was a burden. In fact, they were eager to solve all the problems of the NPCs in the game. They were happy, very confident, motivated, and immersed with the storyline in the *Scribblenauts* to be great like superheroes who fight against obstacles to make the world more beautiful. Without them realizing it, they have learned in this case learning to read, increase vocabulary, practice critical thinking and problem-solving skills. Because during the game, they have to understand a problem from the clue, then understand all the vocabulary needed, and enthusiastically go through the 7 steps of Maastricht till the last phase.

The effect of the PBL method using the *Scribblenauts Unlimited* video game characterizes how competent PBL is to rise the potential of students and to make TEFL in Indonesia more colorful and engaging. This supported by study who believe that PBL covers the 21st century students' demands as self-regulated people to have some skills such as critical thinking, problem solving, creativity, collaboration, communication, and digital literacy (Abdulah et al., 2021; Mutohhari et al., 2021; Othman & Shah, 2013). Moreover, students nowadays are advanced, they benefit from a diversity of instructional delivery regardless of content to better suit their requirements. Within the class using the PBL method, the students have the opportunity to learn actually with an emphasis on learning through real-world scenarios and problems (Ali, 2019; Lapek, 2018; Othman & Shah, 2013).

The researcher saw that the students were no longer sleepy and bored in English class because they were motivated to think without feeling forced. This of course has a direct or indirect impact on their HOTS abilities, especially since PBL is one of four methods which is recommended by the Ministry of Education and Culture of Indonesia in Permendikbud No. 22 Year 2016 to be implemented in school curricula activity in Indonesia to be in line with 21st century characteristic, such as abundance of information, computation, automation, and freedom of communication (Fearnley & Amora, 2020; W. R. Watson, 2012). Therefore, if the use of PBL can be carried out massively with fun learning concepts such as using video games which is in line with technological developments in the 21st century, students today will achieve their learning goals, namely the skills to survive in their era in the

future. However, it should be underlined that the role of the teacher is very important to control the atmosphere in the classroom. It would be nice if the teacher remained friendly, smiling, not easily angered by controlling emotions as well as possible so that students do not feel afraid or uncomfortable. And make sure that students continue to respect with a sincere heart without making it up or out of compulsion. Because the authority of a teacher does not have to be shown in a hard, firm, or strict way, but can also be shown with affection and characteristics that are fun and not boring.

Despite the results, this study was not free of issues because several issues occurred while this study was conducted. The first issue was a very tight time allocation that made the researcher and the students have to concern with time management. Although the researcher already planned the time for each activity while teaching, sometimes the time allocation plan was completely off. Because it was difficult for the researcher to force or push the students to stop thinking and collecting their ideas due to the time limit. So, the researcher often gave the students more extra time so that they were happy and proud of their thinking output. On the other hand, the number of problems to solve also decreased for example it was planned 3 problems before, but only 2 problems were picked due to running out of time. The second issue was the meeting that was conducted outside school hours. Although the school already gave the permission, the researcher still had to ask for permission from parents and explain this activity to the students' parents as well to make it more clear. So, the parents did not worry and complain about why their children did not come home yet. Moreover, in the Sawan village, some of the students had to help their parents to work when arriving back home after school, for example in the ricefield or selling *canang*. So sometimes, one to two students were late at joining the activity. But overall, the research was conducted as was expected without huge troubles that could interrupt.

4. CONCLUSION

In conclusion, the implementation of Problem-Based Learning using Scribblenauts Unlimited video game gave significant effects on students' English learning achievement according to the pretest-posttest descriptive statistics results, paired t-test results, and Cohen's *d* effect size results. As a complement, the students' also describe that they felt happy, engaged, motivated, more confident, and developed well as how this implementation affects their English learning achievement. Besides that, the English teacher of XI AKL 2 class at SMK Negeri 1 Sawan has positive opinions towards the implementation of PBL using Scribblenauts Unlimited because it is related to HOTS and suitable with the characteristic of nowadays students who are digital natives generation in 21st century era.

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