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Game-based Learning in TOEFL Preparatory Course

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Abstract. The study examined the effectiveness of game-based learning in TOEFL preparatory course section 2 – structure and written expression, given over a period of 8 meetings. Employing two-cycle classroom action research design, it engaged diploma students from purposefully selected major, Railway Mechanical Technology, in Politeknik Perkeretaapian Indonesia Madiun (*N*=48). The first cycle learned using paper-based learning (4 meetings), and the second cycle learned using game-based learning (4 meetings). All learning processes were conducted outside classroom. The data was gathered through pretest before the first cycle and posttests after each cycle. Then, analysis was run in SPSS 25 using descriptive statistics, paired sample t-test and *Cohen d* to determine the degree of impact of the students' learning outcomes. The findings showed that there was no mean difference between pretest and first cycle posttest, but there was mean difference between pretest and second cycle posttest and first cycle posttest and second cycle posttest. The test results before and after implementing game-based learning had strong relationship with modest impact. It meant that game-based learning was more effective than paper-based learning to accommodate students in TOEFL preparatory course section 2.

Keywords: game-based learning; Kahoot!; outside classroom; Socrative; structure and written expression; TOEFL preparatory course

INTRODUCTION

Politeknik Perkeretaapian Indonesia Madiun chooses TOEFL ITP as the test for proving students' English proficiency which then, decided as one of the graduation requirements. Before students take the TOEFL ITP test, they have to join English training in TOEFL preparatory course to equip them with competencies needed to pass required score for graduation. The TOEFL preparatory course was conducted offline for 20 meetings lasted for 40 hours. However, Covid-19 pandemic has changed the education system in Politeknik Perkeretaapian Indonesia Madiun. All classes have to be done online, including the TOEFL preparatory course. During the pandemic, the course was conducted online through zoom meeting with some variation using Students Response System such as *Google Form*, *Socrative*, and *Kahoot!*. The course ran normally, yet, the results of the test decreased. The most significance decline was on TOEFL section 2 score.

In past Covid-19 pandemic, the TOEFL preparatory course has been back to normal, conducted offline. However, the results of structure and written expression score are still the lowest of other skills – listening comprehension (section 1) and reading comprehension (section 3). A previous study conducted in Politeknik Perkeretaapian Indonesia Madiun showed that integrating task- and game-based learning in the online TOEFL preparation course improved students scores significantly in three sections (Pratiwi & Waluyo, 2022). The effect sizes of the treatment in online class: weak, modest and modest. Instead, digital classes integrating *Google Form*, *Kahoot!*, *Quizlet*, *Socrative* and *Quizizz* were more effective compared to traditional one in terms of learning outcomes (Nurhidayat et al., 2021; Pratiwi & Waluyo, 2023; Wahyuni et al., 2020). Yet, the survey showed that the students still found the biggest problem in section 2 – structure and written expression, during the TOEFL ITP test (Kariadi & Pratiwi, 2022; Pratiwi, Atmaja, et al., 2021; Ubaedillah & Pratiwi, 2021).

Implementing multiple e-learning technologies has been proven to improve students' learning outcome and received positive feedback in online classes of the TOEFL preparatory course (Akmal et al., 2020; Pratiwi, Atmaja, et al., 2021; Tilana et al., 2019). The results of the study demonstrated that participants' overall language performance during the sessions and in the classroom improved as a result of playing English language learning games, including the subjects' ability to structure and express themselves in writing (Santacruz et al., 2020). However, another study found that all the players were enthusiastic about jumping into the game, but only four of them looked at the manual closely (Qin & Hua, 2020). The success of in-game lessons, then, hinges on players' perspectives, the game's appropriateness, the language level employed, and the players' desire for such help. Further, the purpose game-based learning could affect learning-related behaviors

or attitudes. These perspectives then affect learning through either a moderating or mediating mechanism, enhancing the connection between teaching quality and performance (Landers, 2014).

Previous studies have shown that digital games can be an excellent learning environment and promote cooperative problem solving among students (Febriani et al., 2022; Wahyuni et al., 2020; Waluyo, 2020; Wang & Huang, 2021). Modals, gerunds, and infinitives were improved by playing digital games (Castillo-Cuesta, 2020; Elyas et al., 2020; Hashim et al., 2018). Those materials are included in the TOEFL preparatory course section 2 – structure and written expression. In this section, ten major subjects are as follows: Subject-verb agreement; verb tense agreement; word forms; reduced clauses; connectors; gerunds and the infinitive; comparisons; clause creation; parallel structure; redundancy (Educational Testing Service, 2017; Golubovich et al., 2018). According to a survey conducted in an Indonesia university, the hardest three questions were those involving negation, reduced form, and parallel structure (Hajri et al., 2015). The students' mistakes were brought on by their inexperience, negligence, uncertainty, obliviousness, and casting mistakes.

Considering the beneficial effects of game-based learning in learning grammar and the need for improving students learning outcome, this study purposes to examine the effectiveness of game-based learning in TOEFL preparatory course. It seeks the effect of game-based learning in TOEFL preparatory course especially on the section 2 – structure and written expression, in which the students got the lowest results in post pandemic Covid-19. As previously state above, game-based learning effectively improved students learning outcomes in all skills, including grammar. However, some studies also found out that not all students could be engaged into in-game instructions. Therefore, investigating the effectiveness of a game-based learning in the same setting with a paper-based learning can give additional perspectives and add a comprehensive picture of teaching and learning process in a TOEFL preparatory course especially section 2 – structure and written expression, using those two methods.

METHODS

This study employed classroom action research design. The main point was on examining the effectiveness of game-based learning in TOEFL preparatory course section 2 – structure and written expression. When educators make many adjustments to their instructional strategies in an effort to address new issues in the classroom and with their students, they are engaging in action research (Waluyo & Bakoko, 2021). There were two cycles used in this study: 1) first cycle: students learned using paper-based learning (4 weeks); and 2) second cycle: students learned using game-based learning (4 weeks). The pretest was conducted before the class began, and after each cycle a posttest was administered as the evaluation of each learning method.

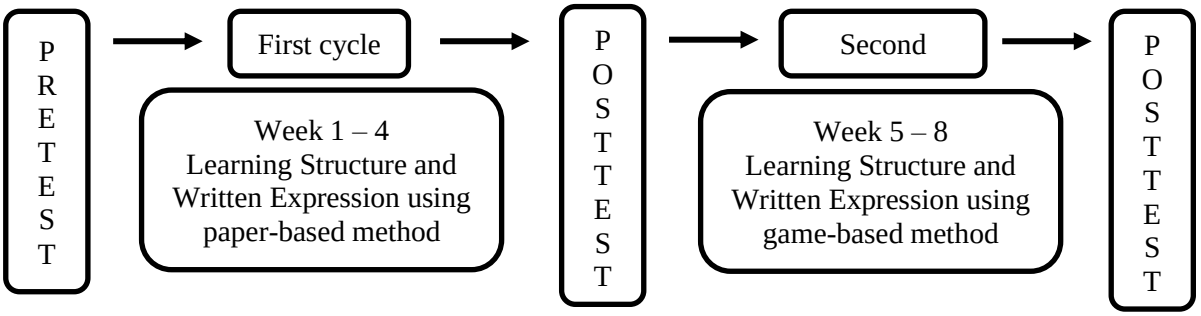
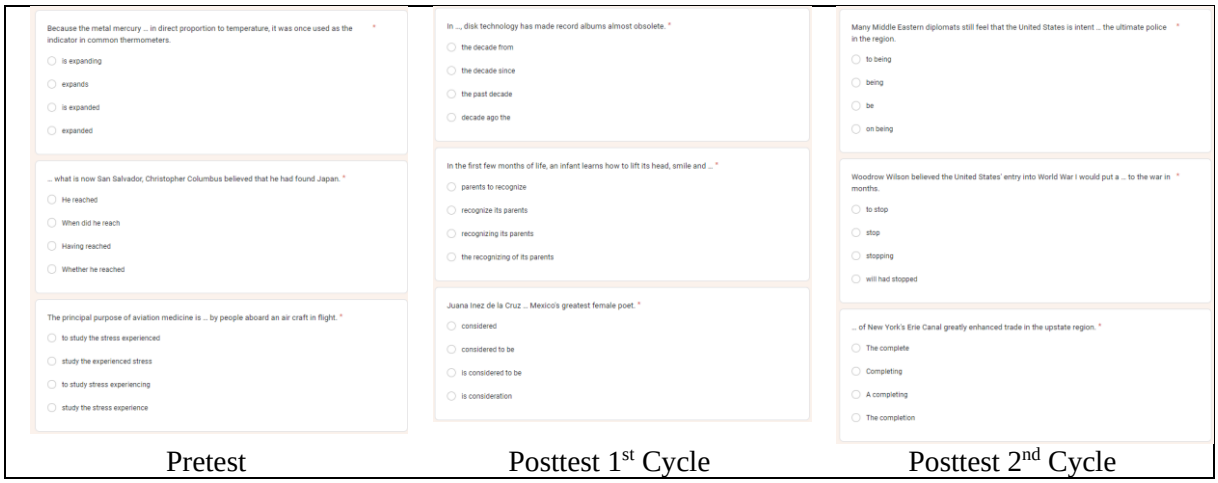


Figure 1. Research Design

The study was conducted for 8 meetings, each meeting lasted for 1.5 hours in Politeknik Perkeretaapian Indonesia Madiun. The participants were purposefully selected from Railway Mechanical Technology study program major who registered in TOEFL preparatory course in 2023 (*N=48*). They were at age 20-22 years old (male = 44, female = 4). All the participants were informed about of the research and agreed to participate in this study. The results of the study would not affect anything on their course grade or the TOEFL ITP results.

There were three data used in this study: pretest, posttest after first cycle and posttest after

second cycle. The test were in the same format – 40 multiple-choice questions taken from Barons' TOEFL handbook (Sharpe, 2020). The analysis of the data using SPSS 25 in terms of descriptive statistics, paired-sample t-test including *Pearson r* coefficient and *Cohen d* coefficient to get comprehensive result of the effectiveness of paper-based and game-based learning. The data, then, was interpreted based on the results of the correlation and comparison between pretest, posttest first cycle and posttest second cycle.



Pretest | Posttest 1st Cycle | Posttest 2nd Cycle

Figure 2. Sample of Test Questions

RESULTS AND DISCUSSION

The data was analyzed in SPSS 25, starting with descriptive statistics. It was used to know the minimum and maximum data, the average score, and the homogeneity of the data from pretest, posttest 1st cycle and posttest 2nd cycle. In pretest, the minimum data was 17.50 with the maximum point 65, and the average score was 38.95 (N=48, SD=11.62). In posttest 1st cycle, the minimum data was 10 which was lower than the pretest, while the maximum data was 77.50. The average score of pretest 1st cycle was 39.68 (SD=14.40). In posttest 2nd cycle, the minimum data was 20 with the maximum score 72.50, and average score 47.76 (SD=12.65). The data showed that on the average, students learned using game-based method got higher score in structure and written expression. Even if the lowest score was also mentioned while utilizing the paper-based mode of instruction, the student who used that type of instruction nonetheless received the highest score. Further, Skewness and Kurtosis results indicated that the data was homogeneous, hence it was acceptable to evaluate it using a paired sample t-test in a parametric test (Skewness = .35, .66, .03 and Kurtosis = .67, .67, .67). If the values of Skewness and Kurtosis were between +2 and -2, the data was regularly distributed (Mondal & Mondal, 2017; York, 2017).

Table 1. Descriptive Statistics

	N	Min	Max	Mean	Std Deviation	Skewness		Kurtosis	
						Statistic	Std. Error	Statistic	Std. Error
Pretest	48	17.50	65.00	38.95	11.62	.35	.34	-.57	.67
Posttest 1st Cycle	48	10.00	77.50	39.68	14.40	.66	.34	.72	.67
Posttest 2nd Cycle	48	20.00	72.50	47.76	12.65	.03	.34	-.47	.67

The second analysis ran in paired-sample t-test to know the correlation of the test scores. The first-paired was the pretest and posttest 1st cycle. The results showed that there was there was no differences between the results of pretest and posttest 1st cycle. It means that paper-based method has no effect on students' learning outcomes in structure and written expression. The

second-paired was pretest and posttest 2nd cycle. The analysis showed that there was difference between the test results in pretest and posttest 2nd cycle. It means that game-based learning has effect on students' learning outcome in TOEFL preparatory course section 2. The last-paired was posttest 1st cycle and 2nd cycle. The results of the analysis revealed that there was difference between posttest 1st cycle and posttest 2nd cycle results. It means that game-based learning is more effective than paper-based learning in mastering material structure and written expression of TOEFL preparatory course for students in Railway Mechanical Technology study program, Politeknik Perkeretaapian Indonesia Madiun.

Table 2. Paired Sample t-test

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper	t	df	Sig. (2-tailed)
Pretest-Posttest 1st Cycle	-.72	11.69	1.68	-4.12	2.66	-.43	47	.668
Pretest-Posttest 2nd Cycle	-8.80	10.63	1.53	-11.88	-5.71	-5.7	47	.000
Posttest 1st-Posttest 2nd Cycle	-8.07	8.54	1.23	-10.55	-5.59	-6.54	47	.000

Since the results of paired sample t-test showed that there was difference between pretest and posttest 2nd cycle and posttest 1st and 2nd cycle, both data paired were continued to be analyzed to find out the effect size of the treatment using correlation coefficient: *Pearson r* and *Cohen d*. The analysis showed that pretest and posttest 2nd cycle had modest effect (r=.619; d=.479), while posttest 1st and posttest 2nd cycle had strong effect (r=.808; d=.633). It means that game-based learning effectively improved students' learning outcome in structure and written expression and more effective that paper-based learning in TOEFL preparatory course.

Table 3. Correlation Coefficient

	Pretest-Posttest 2nd Cycle	Posttest 1st-Posttest 2nd Cycle
Pearson r	.619	.808
Cohen d	.479	.633
Sig. (2-tailed)	.000	.000
N	48	48

Based on the results of the data analysis, it can be said that game-based learning is more effective than paper-based learning for Railway Mechanical Technology students in Politeknik Perkeretaapian Indonesia Madiun during their TOEFL preparatory course in learning section 2 – structure and written expression. While the results of section 2 in the TOEFL ITP test was the lowest compared to other skills (listening and reading comprehension), it might not be caused by students learning method. Landers (2014) explained that there were two factors influencing students' learning outcome: instructional design quality and outcomes (a moderating process) and learning method (a mediating process). As mentioned in the previous study that game-based learning was effective to improve students learning outcome, the result of this study supported those findings (Pratiwi, Atmaja, et al., 2021; Pratiwi & Waluyo, 2023; Waluyo, 2020). Yet, instructional design quality as another factor affecting students' learning outcome is not investigated in this study. Therefore, it is suggested for the future research to study about instructional quality and outcome in the classroom to add comprehensive results of the study.

This study adds point of view about the effectiveness of game-based learning method in

English language learning especially in TOEFL preparatory course section 2 – structure and written expression. Game-based learning as a part of digital technology has been regarded as the effective and efficient tools to engage students in language learning as well as motivate student and improve students' autonomous learning (Fithriani, 2021; Pratiwi et al., 2022; Pratiwi, Zulkarnain, et al., 2021; Pratiwi & Waluyo, 2022; Tilana et al., 2019). By conducting classroom action research, the effectiveness of a learning method can be measured comprehensively as it can improve practice toward issue that is studied. Since the use of the same participants for two kinds of learning method, this study can be used as students' and teachers' evaluation in teaching and learning process. However, as much as this study offered, there are some limitations that have to be acknowledged. First, the small size of the participants and the purposive sampling method cannot be used to generalize the results. Second, the setting of the study was conducted in vocational university in which English is as general course and given for 2 semesters only: 1st and 2nd semester. Aside from the limitations of the study, the main purpose of this study to find out the effectiveness of game-based learning in TOEFL preparatory course has been answered.

CONCLUSION

The findings of this study confirm the effectiveness of game-based learning method in TOEFL preparatory course section 2 – structure and written expression. It was significantly improved students' learning outcome with modest effect compared to students' prior knowledge and strong effect compared to paper-based learning method. The pedagogical implication of this study is that game-based learning can be offered as one the learning method for students in language learning especially in grammar skill. Because Kahoot! and Socrative were used in this study and were well-known to the students, it is believed that these game-based applications will engage and inspire them.

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