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A Project-Based Digital Book: Its Influence on Students' Writing Skills

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Abstract

A project-based digital book is a book that contains texts, images, sound, and videos including project learning stages that encourage students' motivation and creativity to write. The study aims to find out the influence of a project-based digital book on students' writing skills in higher education institutions in Madiun, Indonesia. The study is experimental research that uses a one-group pretest-posttest design. The data collection technique employs an instrument of a test on descriptive writing skills. The data analysis technique is conducted using t-test statistics. The research results indicate an influence of the project-based digital book on students' writing skills. It is proven by the difference in the average score of the pretest and posttest. The average pretest score of the descriptive writing result is 64.89, whereas the average posttest score is 77.02. The minimum score for the pretest is 55 and the posttest is 70. The maximum score of the pretest is 70, whereas the posttest is 85. Based on the calculation results of the t-test analysis indicates a significance value of 0.000 < 0.05.

Keywords— project-based, digital book, writing skills

Introduction

The education world continues to face numerous and complex challenges over time. Changes in education regulations and policies become a distinct challenge for educators and education practitioners in the field. The education sector that becomes a spearhead in achieving the national goal of education in the life of the nation requires serious attention in encountering the industrial era of 4.0. Industry 4.0 provides changes in the current community life. It develops by creating something new and due to the rapid changes, education as part of the community life must prepare for the changes to be able to anticipate them through efforts in improving the education process and learning.

Technology is currently entering the education field (Tugun et al., 2020), (Sugandi & Kurniawan, 2018), (Mamun, Lawrie, & Wright, 2020) (Chiu, 2020). Higher education institutions as one of the sectors of education providers should align their teaching and processes to the technological advancement so that future generation is ready and easy to adapt to the time, especially in jobs. Education in the present no longer focuses on a reciprocal between students and teacher, instead it focuses on the network approach where students can have a network or direct connection to various learning sources and information. This encourages the establishment of a new learning method that is more personal that requires students' independence and more-creative teacher approaches. This is particularly applied during the Covid pandemic that needs technological aids for learning. This is due to the online technology that becomes a special channel for the government to overcome the covid pandemic (Beaunoyer, Dupéré, & Guitton, 2020).

Since the issuance of a policy by the Ministry of Education regarding the replacement of the process of teaching-learning activities at school and higher education institutions with an online system, all higher education institutions have

shifted to online learning. This aims to avoid the increase in Covid 19 spread. The enactment of online lectures drives various issues. One of the issues is related to constraints in conveying the previously-prepared content since there is no longer face-to-face interaction between lecturers and students; therefore the lecturers experience difficulty in conveying the content. Moreover, the obstacles also include teaching materials and learning models, methods, and strategies to be used by the lecturers. The lecturers initially have planned all the learning models, methods, and strategies to be used in a lecture; however, they have to change them as an adjustment to the online lecture. Limitations in the learning models, methods, and strategies needed in the online lecture can hinder the lecture (Nakayama, Yamamoto, & Santiago, 2007).

Online learning currently applied has impacted students' writing learning. Numerous students have low writing skills to complete the integrated language learning assignments (Li & Mak, 2022). They have low motivation to develop complicated writing skills (Ghaffar, Khairallah, & Salloum, 2020). The low writing skill is due to the lack of ideas, difficulties to compose vocabulary, and syntax (Etemadzadeh, Seifi, & Far, 2013). Writing skills become imperative in higher education and are used as a member of disciplines in all fields of studies (Kazemi, Katiraei, & Rasekh, 2014). Learning to write should integrate fine motor skills with written language comprehension to produce meaningful writing (Chandler et al., 2021). This is the cause of the lack of skills in writing among students, especially since the implementation of online learning makes students rarely practice writing. Writing skill is a productive skill that can be mastered by students by practicing. Writing is a creative, imagination, expression, and communication activity with others through writing (Bolton, 2011). Writing is communicating ideas and minds through a writing (Graham, 2012). Writing is a recursive process, which means students revise all processes and move back and forth between the stages (Urquhart & Monette, 2005).

Referring to the phenomenon, an alternative is needed that can solve the problem. The solution is a project learning-based digital book as a writing skill teaching material for students in Madiun, Indonesia. The selection of the creation of the project-based digital book is due to the lecturers that must be able to prepare teaching material for students. Additionally, a new phase occurs in education, namely Education 4.0. The industrial revolution 4.0 in education focuses on artificial intelligence, robotics, and smart technologies. These have been applied in and influence everyday life. The situation encourages higher education institutions, to produce successful and competent graduates, to provide and prepare their students to be able to face world challenges. Therefore, it is suitable to develop digital textbooks. Moreover, students favor digital books in learning since they deem digital books are more practical. (Rao, Tripathi, & Kumar, 2016) (Troseth & Strouse, 2017) (Uner & Roediger, 2018).

The digital book is developed on a project basis since project learning could motivate students and lead them to be more active because they involve more in the learning (Gómez-Pablos, Pozo, & García-Valcárcel Muñoz-Repiso, 2017) (Revelle, 2019). Project-based learning also fosters student self-confidence (Tsybulsky & Muchnik-Rozanov, 2019). Project-based learning (PjBL) is considered a promising model for enhancing student learning in higher education (Guo, Saab, Post, & Admiraal, 2020). Based on the problems, a book modification is required with a learning model to foster students' writing creativity during online learning. The teaching material is a project-based digital book. Therefore, the research aims to find out the influence of a project-based digital book on students' writing skills.

Method

Research Design

The research experiment method employed a one-group pretest-posttest design, which is a

study that discloses causality by involving one subject group. The research design includes one group that is observed during a pretest stage and continued with treatment and posttest (Creswell, 2014)

Table 1 One Group Pretest Postest Design

Subjek	Pre-Test	Perlakuan	Post-Test
R	01	x	02

Where:

01 : writing learning before using the project-based digital book

02 : writing learning after using the project-based digital book

x : treatment of a project-based digital book

R : student

Groups that received treatment were students at Universitas PGRI Madiun annd Sekolah Tinggi Agama Islam, Indonesia. The groups were given with pretest of descriptive writing skills before learning started. Then, the treatment was applied to them in the form of a project-based digital book and followed by a posttest. Once the pretest and posttest data were generated, a comparison was performed to identify the influence of the project-based digital book on students' writing skills.

Population and Sample

The population is the overall research subject. The research population was students of the Department of Elementary School Teacher Education and Madrasah Ibtidaiah Education from higher education institutions in Madiun, Indonesia. The research samples included Universitas PGRI Madiun and Sekolah Tinggi Agama Islam, Madiun, Indonesia. The sampling technique employed random sampling according to the results of drawing of experimental group determination from several classes in both universities.

Data Collection Technique

The data collection technique used an instrument which was a test about descriptive writing skills. The test was given before (pretest) and after the treatment (posttest). The test was in the form of descriptive writing practice. Aspects assessed in the writing practice consisted of the accuracy of essay type, clarity of facts in the content, paragraph coherence, effectiveness of sentences, and spelling and punctuation. Detailed of the aspects is elaborated in Table 2.

Table 2 Assessment Aspects of Descriptive Writing

Aspects	Indicators
Accuracy of the essay	Includes a description
Involvement of the sensory aspect	It involves all senses, namely sight, hearing, smell, taste, and touch.
Spelling and Punctuation	Number of spelling and punctuation errors less than 5
Word selection and diction	The use of diction is appropriate, diverse, and interesting (there are fewer than 5 word choices that do not correspond to the observed object).
The suitability of the title with the content	The title is interesting, short, in keeping with the essay, and focused.

Data Analysis Technique

Data analysis in the research comprised prerequisite tests and hypothesis testing. The prerequisite test consisted of a normality test to determine whether or not the data obtained are normally distributed and a homogeneity test to find out the equality level of the subject to be studied. Data reference is stated to be normally distributed if the significance/probability value > 0.05. The data reference is homogeneous if the significance value > 0.05 or both classes come from a population that has a homogenous variance. T-test was conducted after the prerequisite tests as a reference to test the hypothesis. A t-test is one of the statistical tests used to find out whether there is a significant

difference between two samples or variables compared. Reference data of the t-test is that if the significance value > 0.05 then Ho is accepted and H1 is rejected. If the significance value < 0.05 then Ho is rejected and H1 is accepted.

Result and Discussion

The research was carried out in 4 meetings. The first meeting was a pretest to measure the initial descriptive writing skill of the students. The next meeting was learning using the project-based digital book followed by a posttest to measure the students' descriptive writing skills after learning using the project-based digital book. The assessment of descriptive writing skills referred to the test assessment that considered five assessment aspects, namely accuracy of essay type, clarity of facts in the content, paragraph coherence, effectiveness of sentences, and spelling and punctuation. The results of the project-based digital book analysis in empowering students' writing skills are presented in Table 3.

Table 3 Results of Descriptive Writing Skill Analysis

Statistical Results	Pre Test	Post Test
Mean	64,89	77,02
Minimum	55,00	70,00
Maximum	70,00	85,00
Variance	19,01	19,19
Median	65,00	77,50
N	47	47

Based on Table 3, there was a difference in the descriptive writing skill between the pretest and posttest. The average class score of the students' descriptive writing skills in the posttest was 77.02, whereas in the pretest was 64.89. The minimum score of the pretest was 55, whereas the posttest was 70. The maximum score of the pretest was 70, whereas the posttest was 85. The results indicate that the students' descriptive writing skills had a difference between the pretest and posttest. The students' descriptive writing skill was different with the use of the project-based digital book in the writing learning compared to before the use of the book. The comparison of the average score of descriptive writing skill between the pretest and posttest is illustrated in the average histogram chart as indicated in Fig. 1.

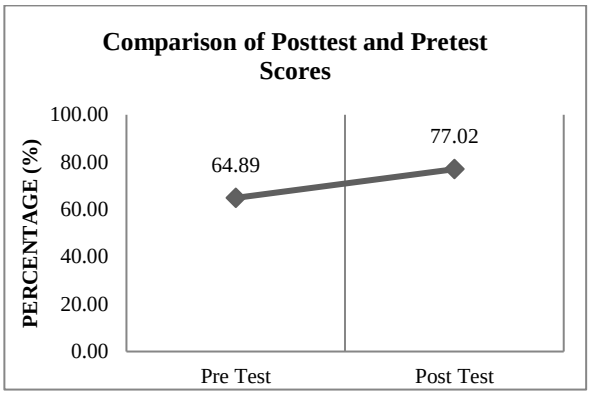

Figure 1 Comparison of Average Score in Pretest and Posttest

The difference in descriptive writing skill could significantly be observed through an analysis based on the pretest and posttest scores. The data analysis was started with prerequisite tests of normality and homogeneity tests. The normality test in this research employed the Kolmogorov Smirnov test, whereas the homogeneity test used Levene's test. Summary data of the analysis results of the pretest and posttest scores of the descriptive writing skill are presented in Table 4. The results of the t-test suggest that there was a significant difference in the average between pretest and posttest as indicated in Table 4.

Table 4 Results of Hypothesis Testing

Test	Score	Type of Test	Results	Decision	Conclusion
Normality	Pretest	Kolmogorv Smirnov	Sig. 0,210	Ho is accepted	Data are normal
	Posttest		Sig. 0,304	Ho is accepted	Data are normal

Test	Score	Type of Test	Results	Decision	Conclusion
Homogeneity	Pretest Post Test	Lavene Test	Sig. 0,085	Ho is accepted	Data are homogeneous
Hypothesis testing		t-test	Sig. 0,000 is smaller than 0,05	Ho is rejected	There was a difference

The t-test analysis results show that there was a significant difference between the pretest and posttest scores regarding the descriptive writing skills. This was indicated by the significance value of 0.000 < 0.05. Therefore, there was an influence of the digital book on Indonesian language skill. The t-test results indicate the difference in descriptive writing skills between students who used the project-based digital book in learning and those who did not. The average score of the descriptive writing skills in the posttest was higher than those in the pretest that did not use the project-based digital book. In summary, the project-based digital book influences the students' descriptive writing skill in higher education institutions in Madiun.

The difference was due to the posttest score that had applied the project-based digital book that helps students in understanding the concept of the content conveyed. The project-based digital book also encourages students to practice writing for real. Moreover, the books also present as a distinguished supporting tool for teachers (González, J. C., Guzmän, J. L., Dormido, S., & Berenguel, 2013). Digital books are easy to obtain since they are not hindered by time and space making students easier to use them (Fojtik, 2015) (Horava, 2013). Additionally, they motivate students to read and write (Martin-Beltrán, Tigert, Peercy, & Silverman, 2017), (Gupta & Dileep, 2020). Through the digital book, teaching and learning activities become more active, interactive, and interesting (Glackin, Rodenhiser, & Herzog, 2014). The current internet development will boost the popularity of digital things.

The rapid development of technology changes human life patterns. Humans now become closer to electronic devices (Roth, Dahms, Welz, & Cattacin, 2019). This makes humans more advanced in the technology world. In the technology era, everything should be fast and easy with one click. This situation makes everyone satisfied. Therefore, digital books are increasingly preferable to many people since they are considered more practical and physically efficient (Fry, 2020).

The differences between pretest and posttest scores in descriptive writing learning were also influenced by project-based learning. The digital book was presented on a project basis. With the project-based, the digital book can help students to work for real. The digital book presented several projects so that students are skillful in writing by practicing more with the existing projects. Project-based learning is a learning model that utilizes problems as an initial step in collecting and integrating new knowledge. The problems turn into experiences in real activities. Project learning is a concept and principle of a discipline that involves students to solve problems and provides meaningful assignments and opportunities for students to work independently in constructing their knowledge and producing a product as its result; therefore, it directs students to solve a problem, communicate, and be creative (Wurdinger & Qureshi, 2015).

Project-based learning can foster essential skills of the 21st century, such as creativity, information fluency, critical thinking, and digital citizenship (Boss & Krauss, 2007). This will drive students to be more creative thus easy to write. Students become more skillful in writing. Moreover, project-based learning has student-centered characteristics that include open and structured categories. The first is a structured project where students are provided with a guideline. Students get creative according to the guidelines. Second, projects by topic where students could select topics they are interested in; thus, they can produce a product

suitable to their interest. Third, closed open projects that utilize less structured guideline. Students are directed to hone their creativity (Gregory & Chapman, 2007).

Project-based digital books have characteristics that develop student skills, allow students to have creativity, encourage students to cooperate, and lead students to access information by themselves. The project-based learning also requires students to participate in projects provided. These will simplify students' learning and practicing. This project-based digital book also has feedback on writing tasks that students have done. This activity aims to improve writing skills (Razali, Rahman, Ahmad, & Othman, 2021). Therefore the project-based digital books can influence writing skills, which is a main important skill to be mastered by students of the pre-service teacher to support learning in elementary school.

Conclusion

Project-based digital book is one of the teaching materials in the form of an innovation book that contains texts, images, videos, and sound that applies project learning stages. The project-based digital book is utilized in writing learning for students of the Department of Elementary School Teacher Education and Ibtidaiah Teacher Education in Madiun, Indonesia. The utilization of the project-based digital book indicates its influence on the students' writing skills. This is evidenced by the difference in the pretest score before the use of the project-based digital book in learning and the posttest score after its utilization. The research results indicate that the average score of the students' writing before the treatment was 64.89, which was lower than the average score after the treatment of 77.02. In addition, the t-test analysis results show a significant difference between the pretest and posttest scores related to descriptive writing skills. Based on the calculation results of the t-test analysis, the significance value was $0.000 < 0.05$.

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