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The Impact of Implementing an Inquiry-Based Learning Model with Pop-Up Book Media on the Academic Performance of Elementary School Students

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CONTENT

ABSTRACT
The purpose of this study was to determine whether there is an effect of using the inquiry learning model using Pop-Up Book media on student learning outcomes at SD Islam AL Falih Kediri City. This type of research uses a quasi-experimental approach. The research method used a pretest-posttest control group design. The research sample amounted to 36 students. The results of the study obtained the findings of the learning outcomes of Science IV grade students who were taught by using the inquiry model better than students who were taught without using the inquiry model. The conclusion of the research is obtained in the context of using learning methods in the classroom, inquiry media can be used as a teaching and learning method. The contribution of the results of this study as novelty and scientific information related to the role and influence of inquiry learning models using Pop-Up Book media on student learning outcomes in schools.

1. INTRODUCTION

To implement quality education, the government has established the 2013 curriculum to be applied in schools/madrasas. The concept of Natural Science in elementary schools is integrated, because it has not been separated separately, such as chemistry, biology, and physics subjects (Mahardi et al., 2019; Wijaya et al., 2018; Humayra et al., 2022). Related to Natural Science learning, not everything students learn is concrete. Natural Science learning has abstract concepts that require student understanding in learning them (Gani, 2016). To make it easier for students to learn abstract things, media can be used (Magdalena, 2021). Media is also believed to be able to help teachers in facilitating and overcoming communication problems experienced by teachers when teaching material. This can be done by using learning media that stimulates the student's thinking process, learning media is one of the supports in the learning process (Supriyono, 2018), with the existence of learning media can help students learn and can make it easier for teachers to convey material.

Teachers as the main actors in developing learning must use variations in teaching not only stay in front of the class (Nurtanto, 2016). A teacher does not only stand in front of the class lecturing about the material but

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a teacher must have a variety of competencies to support the professionalism of his duties and roles. Thus, it can be seen that the teacher must be able to innovate by using learning models and learning media that are following the material to be taught (Rohman & Susilo, 2019), to improve the quality of student education, deliver material that can be achieved, and slowly change learning patterns into fun and enjoyable learning.

Learning media is the media used in learning, which includes teacher aids in teaching and means of carrying messages from learning sources to learning message recipients (students) (Nurrita, 2018). Learning media is a means to provide stimuli for students so that the teaching and learning process occurs (Tafonao, 2018). Learning media is a form and means of delivering information that is made or used following learning theory, can be used for learning purposes in channeling messages, stimulating thoughts, feelings, attention, and willingness of students to encourage a deliberate, purposeful, and controlled learning process (Rahma, 2019). Learning media is one of the learning components that have an important role in teaching and learning activities (Febrita & Ulfah, 2019). Learning media is a tool used to further streamline communication and interaction between teachers and students in the teaching and learning process at school (Hasiru et al., 2021). By using learning media, it will be more fun for students and the learning process can run effectively.

But in reality, teachers have not made innovations in choosing the right learning models and media (Rahmayani, 2019). Whereas elementary school students are very interested in new things. In this modern era, there are still many teachers who teach authoritarian and teacher-centered. Teacher-centered learning only makes students objects, not subjects (Septianti & Afiani, 2020). Teachers explain material using the lecture method to students, causing students to become bored so it is difficult to accept the material provided by the teacher. Teachers who teach by always using conventional methods (teacher-centered) and monotonous will bore students (Harjali, 2017). To overcome this, teachers should know the suitable learning models and media to be applied during the implementation of learning (Purwanti, 2019).

Teachers should be able to create a conducive atmosphere and make learning effective and fun (Ma'ruf & Syaifin, 2021). Pop-Up Book media is a book that has 3-dimensional elements and can move when the page is opened, has a beautiful and upright image display, provides a more interesting visualization of the story, and can develop student creativity to stimulate their imagination (Hanifah, 2014). Pop-Up Book media can make learning more active and can improve student learning outcomes increase (Rahmawati, 2014). Pop-Up Book is one of the learning media that is in such a way designed by the teacher to attract students' attention to take part in lessons and absorb lessons as much as possible (Umam et al., 2019). Pop-Up Book gives more pleasure for children to read because when reading Pop-Up Book, children can imagine and interact with what they read by touching the pictures that appear in the book (Permadi et al., 2020). Pop-Up Book can be used as an alternative learning media that can arouse children's imagination and is a practical media both in use and manufacture, only need to make a picture pattern on paper, after which it is cut and pasted on cardboard then it becomes a Pop-Up Book.

Based on the results of preliminary observations made by researchers at SD Islam AL Falih Kota Kediri, researchers saw that the continuity of teaching and learning in the classroom turned out that students still looked passive, there were still many students chatting with their friends, there were still many students who did not understand the material presented by the teacher because during the teaching and learning process the teacher did not use learning media, so that children felt bored, because they were bored many students came in and out of class with the excuse of taking out the trash, tapering and others. As a result, when students are asked to do the exercises given by the teacher, many students ask again about the material that has been conveyed, even though the teacher has explained it before, and there are even students who do not do the exercises.

By looking at the student learning process, the researcher interviewed the homeroom teacher at SD Islam AL Falih Kota Kediri, from the results of the interview the teacher explained that the students' grades had not reached completion, and there were still many students who were less enthusiastic in learning judging from the daily grades in homeroom. The results of student learning in Natural Science subjects have not reached the Minimum Completeness Criteria standards set. This can be seen from the student assessment notebook of 36 students, there are still 18 students or 50% of the total number of students in class IV who have not reached the Minimum Completion Criteria (70). They feel bored learning only using the lecture method and have difficulty understanding the subject matter because in learning the teacher has not used media that can support students' enthusiasm in learning so learning objectives have not been achieved.

One alternative so that students can understand the subject matter and achieve learning objectives is to use the inquiry model, where students are asked to find answers and can solve problems with the help of Pop-Up Book media. With the Pop-Up Book media, it is hoped that students can stimulate their imagination to understand the subject matter and can improve student learning outcomes. In addition, the learning process with Pop-Up Book media will be much more fun because the media can increase students' interest and attention in the learning process.

Based on the background of the research problem above, the purpose of this study is to determine whether there is an effect of using an inquiry learning model using Pop-Up Book media on student learning outcomes at SD Islam AL Falih Kota Kediri. The contribution of the results of this study as novelty and scientific information related to the role and influence of inquiry learning models using Pop-Up Book media on student learning outcomes in schools.

2. METHOD

2.1 Research Methods

This type of research is quantitative research with a quasi-experimental approach. This research is intended to determine whether or not there is an effect of "something" imposed on the subject under study through the t-test on the effect of learning outcomes in thematic learning. This type of quantitative research is research used to examine samples or populations that answer hypotheses using relevant theories where the research data are in the form of numbers. The design used in this research is a pretest-posttest control group design. In this study, two groups were involved, namely the experimental class and the control class. Before learning, the control class and experimental class were given a pretest first. Then for the experimental class, learning is carried out by being given treatment, namely with the inquiry model assisted by Pop-Up Book media while in the control class learning is carried out conventionally, but still teaching the same material. After learning the two classes, a posttest test sheet was given. In this study, it was carried out aiming to find the effect of different treatments in two classes, so that there were differences in student learning outcomes in the domains of knowledge, attitudes, and skills. Pretest-Posttest Control Group Design can be explained in the Table below:

Table 1. Pretest-Posttest Control Group Design

Eksperimen	01	M	X	02
Kontrol	03	M	C	04

Description:
- 01 : Implementation of the pretest in the experimental group.
- 03 : Implementation of the pretest in the control group
- 02 : Implementation of posttest in the experimental group
- 04 : Implementation of posttest in the control group
- M : Sample Matching
- X : Learning activities in the experimental group using the inquiry model using Pop- Up Book media
- C : Learning activities in the control group using conventional learning.

This Pretest-Posttest Control Group Design scheme table illustrates that the effectiveness of the treatment is shown by the difference between (O2-O1) in the experimental group and (O4-O3) in the control group.

2.2 Research Sample

The sample in this study were all fourth-grade students at SD Islam AL Falih Kota Kediri totaling 36 people consisting of control classes and experimental classes. Consideration all fourth-grade students is sampled because the population is less than 100. Sample selection using a non-probability sampling technique called total sampling. Total sampling is the determination of the sample by taking all members of the population as respondents or samples.

2.3 Data Collection

Data collection using a test scale (Guttman scale). The Guttman scale is a scale used for correct answers that are firm (clear) and consistent. A test is a series of statements or exercises as well as tools used to measure skills, intelligence knowledge, abilities, or talents possessed by individuals or groups. In this study, tests were used to determine the effect of using Pop-Up Book media on student learning outcomes.

2.4 Validity and Reliability of Instruments

2.4.1 Validity Test

Instrument validity is carried out to determine the levels of validity or validity of a research instrument. An instrument that is valid or valid has high validity. Conversely, a less valid instrument means it has low validity. The validity test results use product moment. Based on the product moment analysis, the results of 25 test items obtained were 20 valid items. While 5 items were declared invalid.

2.4.3 Reliability Test

Instrument reliability is carried out to determine the extent to which a measuring instrument can be trusted or relied upon. Reliability shows the stability/consistency of the measurement results. The formula used to test the reliability of the instrument in this study is the Spearman-Brown formula.

The results of the reliability test analysis obtained show that the value of df = 15, with a significant level of 5% is 0.514. So it can be said that the value of r11 is 0.9209 while r table 0.5514 stated that the research test questions are reliable.

2.5 Data Analysis

2.5.1 Prerequisite Test

1) Normality Test. A normality test is conducted to determine the normality of data distribution. The purpose of this test is to determine whether the data taken is normally distributed data or not.
2) Homogeneity Test. The homogeneity test is carried out to determine whether the two population groups are homogeneous or heterogeneous. What is meant by the homogeneity test here is to test whether or not the variations of two or more distributions are the same. The homogeneity test used in this study is the Fisher test.

2.5.2 Research Hypothesis Test. This test was conducted to determine whether there was an increase in the learning outcomes of fourth-grade students at AL Falih Islamic Elementary School, Kediri City using the "t" test formula.

3. RESULT AND DISCUSSION

3.1 Result

3.1.1 Description of Research Data

1) Experimental Group Pretest Results

Table 1. Experimental Group Pretest Results

Pretest Score	Category	Frequency	Percentage (%)
50,13-100	High	3	16,7%
29,87-50,12	Medium	13	72,2%
1-29,86	Low	2	11,1%
Total		18	100%

The experimental group pretest results showed that there were 3 students grouped with high scores (16.7%), 13 students grouped as medium scores (72.2%), and 2 students grouped as low scores (11.1%).

Tabel 2. Hasil Pretest Kelompok Eksperimen

Pretest Score	Category	Frequency	Percentage (%)
50,13-100	High	4	22,2%

29,87-50,12	Medium	11	61,1%
1-29,86	Low	3	16,7%
Total		18	100%

The control group pretest results showed that there were 4 students grouped as high scores (22.2%), 12 students grouped as medium scores (61.1%), and 3 students grouped as low scores (16.7%).

2) Control Group Posttest Results

Table 3. Control Group Posttest Results

Posttest Score	Category	Frequency	Percentage (%)
90,27-100	High	2	11,1%
69,73-90,26	Medium	13	72,2%
1-69,72	Low	3	16,7%
Total		18	100%

The experimental group pretest results showed that there were 3 students grouped as high scores (16.7%), 13 students grouped as medium scores (72.2%), and 2 students grouped as low scores (11.1%).

Table 4. Control Group Posttest Results

Posttest Score	Category	Frequency	Percentage (%)
78,3-100	High	4	22,22%
61,7-78,2	Medium	10	55,56%
1-61,6	Low	4	22,22%
Total		18	100%

The control group pretest results showed that there were 4 students grouped with high scores (22.22%), 10 students grouped with medium scores (55.56%), and 4 students grouped with low scores (22.22%).

3.1.2 Normality Test

Calculation of the normality test is done by comparing the value of χ count with χ table at the significance level db = k-3 = 6-3 = 3 = 0.05 obtained χ table = 7.815 with the following test criteria: If χ count ≤ χ table then the distribution is normal and vice versa if χ count ≥ χ table then the data distribution is not normal. Based on the results of the posttest normality test calculation with the inquiry model using Pop-Up Book media (variable X) has χ count = 2.208, while the posttest normality test calculation without using the inquiry model (variable Y) has χ count = 1.815. From these results, it turns out that both variable X and variable Y have a smaller χ count value.

3.1.3 Homogeneity Test

The homogeneity test calculation is done by comparing the value of F count with the F table at the significance level = 0.05 and dk numerator = na - 1 and dk denominator = nb - 1. If F count ≤ F table, then the two data groups have the same variant or homogeneous.

The calculated result shows the F count = 1.29. Furthermore, the value of F count is compared with the value of F table for = 0.05 and dk numerator = 1 and dk denominator = 17 obtained the value of F table = 4.45. It turns out that the value of F count ≤ F table (1.29 ≤4.45). So it can be concluded that the two groups of data have the same variant or are homogeneous.

3.1.4 Research Hypothesis Test

Research hypothesis testing is carried out to determine whether there is an effect of using the inquiry model using Pop-Up Book media on the learning outcomes of grade IV students in SDN 07 Bengkulu.

Before comparing with t table, df or db = (N1 + N2) - 2 = (18 + 18) - 2 = 36 - 2 = 34. At a significant level of 5%, namely. Thus t count> t table (6.14> 1.691) which means that the working hypothesis (Ha) in this study is accepted, namely the learning outcomes of grade IV students taught using the inquiry model are better than students taught without using the inquiry model at SDN 7 Bengkulu Tengah. While Ho is rejected, the learning

outcomes of Science IV grade students taught using the inquiry model are not better than students taught without using the inquiry model at SD Islam AL Falih Kota Kediri.

3.2 Discussion

The results showed that the working hypothesis (Ha) in this study was accepted, namely the learning outcomes of fourth-grade science students taught using the inquiry model with Pop-Up Book media were better than students taught without using the inquiry model with Pop-Up Book media at SD Islam AL Falih Kediri City. By using the inquiry model media students are more active, and enthusiastic in participating in learning, dare to go to the front of the class to answer questions when told by the teacher and the learning outcomes are satisfactory. Proven in the t-test analysis obtained the results of t count> t table, namely (6.14> 1.691), with the average value of the posttest results of class IV A higher than class IV B, namely 80> 70.

The inquiry learning model using Pop-Up Book media as variable X and learning outcomes as variable Y based on the test results obtained that the inquiry model using Pop-Up Book media affects the learning outcomes of grade IV students at SD Islam AL Falih Kota Kediri. This learning model refers to the learning approach used including teaching objectives, learning environment, stages in learning activities, and classroom management. The learning model directs in designing learning to help students in achieving learning objectives. The application of a model, strategy, or media in learning science is very important in improving students' abilities constructively and leading to mastery of the material. Therefore, in the teaching and learning process, teachers must have the right strategies, methods, and learning media, effective, efficient, and on the expected goals, one of which can actively involve students, attract students' interest and attention, develop student motivation, so that of course it can improve learning outcomes (Rimahdani et al., 2020). By using Pop-Up Book Media as a medium for learning Science, students have a high interest in science lessons and the negative impression of science lessons can be eliminated (Darwis & Hardiansyah, 2021).In addition, the content is interspersed with interesting elements so that learning becomes fun. If Pop-Up Book Media is used in the teaching and learning process, then Pop-Up Book Media can help create a level of understanding in learning Science (Sugiarti, 2017). So it can be assumed that Pop-Up Book Media can improve students' Cognitive learning outcomes in learning Science.

Learning models can essentially be used and developed for activities to be carried out (Abdullah, 2017). The most important thing is how a teacher manages and develops the learning components in a planned design by taking into account the actual conditions of the supporting elements in the implementation of learning to be carried out, for example, time allocation, learning facilities, and infrastructure, costs, and so on. The learning model is a pattern that can be used to form a curriculum, guide classroom lessons, and plan learning materials (Tibahary & Muliana, 2018). Learning models can be used as an option, it can be said that teachers can choose appropriate and efficient learning to achieve educational goals (Surya, 2017).

The function of the learning model is as a guide for instructional designers and teachers in carrying out the learning process to achieve learning objectives (Djalal, 2017). In connection with all of that, the learning model is a pattern of student interaction with teachers in the classroom in the form of approaches, strategies, techniques, and learning methods applied in classroom learning (Asyafah, 2019). The function of the learning model is as a guide for teachers and teachers in carrying out learning (Rohana, 2020). This shows that each model that will be used in learning determines the tools used in learning. The function of the learning model is as a guide for instructional designers and teachers in carrying out learning (Mayasari et al., 2022). Choosing a learning model is strongly influenced by the objectives to be achieved in the teaching and the level of ability of students. In addition, each learning model also has stages that students can do with teacher guidance (Falah, 2014). The learning model serves as a guideline for learning designers and learners in planning in carrying out learning activities.

One of the learning models that can be used is the inquiry model, inquiry is a process for obtaining information by making observations or experiments to find answers or solve problems to questions or problem formulations (Nadhifah & Afriansyah, 2016). The inquiry learning model is one of the models that encourage students to be active in learning (Anggoro, 2016). The word inquire means to participate or be involved in asking questions, seeking information, and conducting investigations. Inquiry learning is a learning activity where students are encouraged to learn through their active engagement with concepts and principles, and

teachers encourage students to have experiences and conduct experiments that allow students to discover principles for themselves (Puspita & Jatmiko, 2013).

In the context of using inquiry as a teaching and learning method, students are placed as the subject of learning, which means that students have a big hand in determining the atmosphere and learning model (Sukmawati, 2020). In this method, each learner is encouraged to be actively involved in the teaching and learning process, one of which is by actively asking questions that do not always have to be answered by the teacher, because all learners have the same opportunity to provide answers to the questions asked (Endarti & Komariah, 2016).In this case, a good question category is a question that is related to the material being discussed, can be answered in part or in whole, and can be tested and investigated meaningfully.

The inquiry model is a learning model that emphasizes the critical and analytical thinking process to seek and find answers to questionable problems (Harahap & Harahap, 2021). Learning with an inquiry learning model that requires the active involvement of students is expected to improve learning achievement, especially students' understanding and communication skills. Inquiry learning aims to encourage students to be more courageous and creative in imagining (Nasution, 2018). With imagination, students are guided to create discoveries, both in the form of improvements to what already exists, as well as creating ideas, ideas, or tools that have never existed before. Students are encouraged not only to understand the subject matter but also to make discoveries. The essence of good thinking is the ability to solve problems (Aini et al., 2018). The basis of problem-solving is the ability to learn in a thinking process situation. Thus, it can be implemented that students should be taught how to learn which includes what is taught, how it is taught, the type of learning conditions, and obtaining new views. One of the information processing models is the inquiry learning model (Nurhudayah et al., 2017).

One of the inquiry learning media that can be used is Pop-Up media, this media is more likely to make mechanical paper that can make images appear more different in terms of perspective or dimensions, changes in shape to be able to move which is arranged as naturally as possible (Miranti & Refelita, 2023). The benefits of using Pop-Up Book media include (1) to develop young people's love of books and reading; (2) for early childhood learners to bridge the relationship between real-life situations and the symbols that represent them; (3) for older students or talented and capable students can be useful for developing critical and creative thinking skills; (4) can help students to capture meaning through interesting image representations and to generate the desire and encouragement to read independently (Fitri & Karlimah, 2018). Pop-Up Book can provide a more interesting visualization of the story (Hadi et al., 2018). Starting from the appearance of images that look more dimensional, images that can move when the page is opened or parts are shifted, and parts that can change shape, have textures like the original object and some can even make sounds (Fitriani et al., 2019). Things like this make the story more fun and interesting to enjoy.

Pop-Up Book media has the first advantage that Pop-Up Book media is practical to use and easy to carry (Ulfa & Nasryah, 2020). The second advantage of this media is that it generally attracts students' attention because it has dimensions when this book is used (Hana et al., 2023). This is certainly an attraction for readers. The third advantage of Pop-Up Book media invites interactive users, both personally and in groups. The fourth advantage is to stimulate the imagination of its users. Pop-up book media is made more varied than ordinary books, this will stimulate the imagination process of its users. Pop-Up Book is interesting and different from ordinary illustrated storybooks in that it provides surprises on each page that can invite amazement when the page is opened (Nabila et al., 2021). Readers like being part of that amazing thing because they have a hand when they open the pages of the book. This makes readers enthusiastic in following the story because they are waiting for what other surprises will be given on the next page. Pop-up books can strengthen the impression that wants to be conveyed in a story so that it can be more pronounced (Sari, 2019). The inquiry model using Pop-Up Book media affects student learning outcomes. Learning outcomes are the abilities obtained by students as a whole which become a measuring tool for changes in behavior that have occurred in students after carrying out the learning process. The learning outcomes that will be measured in this study are cognitive in mathematics subjects which include applying, analyzing, and evaluating. The instrument is used to measure student learning outcomes in the cognitive aspect. Learning outcomes are used as a benchmark for the extent of the success of the material that has been recommended. Learning outcomes are divided into three domains, namely the cognitive domain, the affective domain, and the psychomotor domain. These three domains are domains that can be done by students and can be obtained by students through teaching and learning activities.

Learning outcomes are abilities in the form of new skills and behaviors as a result of training or experience gained. The results of learning in a person are often not immediately apparent without that person taking action to show the ability he has gained through learning.

4. IMPLICATIONS AND CONTRIBUTIONS

The results of this study have implications and contributions to knowledge information about the role of inquiry models using Pop-Up Book media on student learning outcomes. The following describes the implications and contributions of the research:

4.1 Theoretical Implications and Contributions

1) Providing research contributions in the field of education that have to do with the problem of efforts to improve student learning outcomes.
2) To determine the effect of using the inquiry learning model by using Pop-Up Book media on student learning outcomes in Natural Science subjects.

4.2 Practical Implications and Contributions

1) For Teachers. Teachers gain knowledge and insight into the inquiry learning model using Pop-Up Book media.
2) For Students. Students can think inductively and concretely to the abstract, get fun and meaningful learning and increase the learning outcomes obtained by students.
3) For Researchers. Providing experience and insight for researchers in carrying out inquiry learning using Pop-Up Book media and motivating researchers to be able to carry out innovative and fun learning.

The use of Pop-Up learning media can improve students' Natural Science learning outcomes. This is reinforced by the results of the final test (posttest) in the experimental class much different from the results in the control class because Pop-Up learning media makes learning more fun so the test results are much better. The results of this study as teacher input in improving students' Science learning outcomes. One of them is that teachers can use this Pop-Up learning media in appropriate learning to be applied in the learning process, especially in environmental material in the form of multiple choice questions that can improve student learning outcomes.

5. RESEARCH LIMITATIONS

Based on the results and discussion of the research, the following research limitations are presented. Through the limitations of this study, future researchers can consider the limitations of this study, namely:

1) The focus of this study only focuses on the effect of the inquiry model using Pop-Up Book media on student learning outcomes.
2) This research only uses Natural Science subjects and does not use other subjects so that comparisons with other subjects are not made.
3) Student learning outcomes are only obtained from the pretest (influence) and are not based on other aspects.

6. CONCLUSION

In the context of using learning methods in the classroom, inquiry media can be used as a teaching and learning method. Students are placed as the subject of learning, which means that students have a big share in determining the atmosphere and learning model. This learning model refers to the learning approach used including teaching objectives, learning environment, stages in learning activities, and classroom management.

The results of the study concluded that there was an effect of using the inquiry learning model using Pop-Up Book media on the learning outcomes of fourth-grade students at AL Falih Islamic Elementary School, Kediri City. Inquiry learning using Pop-Up Book media aims to encourage students to be more courageous and creative in imagination. With imagination, students are guided to create discoveries, both in the form of improvements to what already exists, as well as creating ideas, ideas, or tools that have never existed before. Therefore, students are encouraged not only to understand the subject matter but also to make discoveries. Research

suggestion. The following suggestions can be presented by researchers based on the results of this study, including (1) Teachers should be able to understand learning methods well considering the lack of student understanding of learning materials; (2) teachers should be able to increase student interest in learning considering the low student learning outcomes; (3) teachers should be able to apply learning methods in every teaching process in the classroom considering the lack of application of creative and innovative learning media.

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AUTHOR CONTRIBUTION STATEMENT

The data that the author conveys and describes in this article are original and based on the results of data collection in the field. Therefore, the researcher is fully responsible for the truth and authenticity of the data that the author conveys.

CONFLICT OF INTEREST STATEMENT

The author declared they have no potential conflicts of interest with respect to the significant competing financial, sponsorship, commercial, legal, organizations, or professional relationship that could influence the research, authorship, and/or publication of this article.

ETHICAL APPROVAL STATEMENT

The author has approved the article to be published in the Indonesian Journal of Innovative Teaching and Learning (IJITL) by following the Publication Ethics and Journal Policies.

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