The influence of Lectora inspire-based interactive learning media on students' learning motivation and mathematical reasoning abilities in primary schools

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Abstract. The purpose of this study was to find out how much learning Interactive based on lectora inspire influence on the learning process. This research uses collaborative action research between lecturers, students, and teachers in 2019 at one of the primary schools in west Java. Data collection techniques through observation, interviews, and tests. the result of the research is to find out how the impact of the use of learning media lectora inspire based interactive on student’s approach is proven to improve 'learning motivation and mathematical reasoning abilities in primary schools.

1. Introduction

Students think that mathematics is a boring subject, since there are a number of students who chat with their friends while the teacher explains the material. Students tend to be bored because the learning process does not contain elements of playing in addition, they have not been allowed to express their opinions because the learning process is teacher-centered. Besides, students are less enthusiastic about the learning process because they are engrossed in their toys. It resulted in low mathematics grade [1].

The problem above can be overcome by collaborating the learning model that is commonly used and the learning model that can improve students' motivation and mathematical reasoning. The teacher uses learning techniques that can create a vibrant and fun learning atmosphere, hence, student’s participation increases. Also, the teacher can use a more practical approach to present attractive mathematics themes.

Motivation is the factor that most influences the success of learning in a classroom. The success of learning will affect students' mathematical abilities. This is in line with Russell et al. [2]; Ryan and Deci, [3]; Rizqi and Surya [4]. Motivation is seen as a pre-requisite of and a necessary element for student engagement in learning. Student engagement in learning is not only an end in itself but it is also a means to the end of students achieving sound academic outcomes.

The School-based Curriculum, Ministry of National Education [5] explained that one of the goals of studying mathematics in schools is to use reasoning on patterns and traits, perform mathematical manipulations in generalizing, compile evidence, and explain mathematical ideas and statements. In line with the government in the National Council of Teachers of Mathematics [6], one of the objectives of learning mathematics is learning to construct mathematical reasoning. Ball, Lewis, and Thamel in Widjaja [7] stated that mathematical reasoning is the foundation for the construction of mathematical knowledge. Mathematical reasoning is a fundamental ability that students must have so that students
can obtain or construct mathematical knowledge. Thus, it can be inferred that students' reasoning abilities are essential abilities for students. This is in accordance with Putri's [8] statement that students' mathematical reasoning skills are essential to improve students' understanding of the usefulness of mathematics itself.

PISA (Program for International Students Assessment) measures communication skill, reasoning skill, representation skill, problem-solving skill, argumentation skill, communication skill, and high-order thinking skill. Indonesia occupied the 61st position of the total participants of 65 countries as quoted by the Research and Development Agency [9] of the Ministry of Education and Culture (http://litbang.kemdikbud.go.id/index.php/survei-internasional-pisa). Indonesia's ability in mathematics showed a low score of 371, which was still below the Organization for Economic Cooperation and Development (OECD) average score. This showed that the mathematical reasoning abilities of students in Indonesia are still lacking.

Emaikwu [10] reported that teaching method affects the response of students and determines whether they are interested, motivated and involved in a lesson in such a way as to engage in learning. This means learning must be student-centered, and fun. Damin [11] also stated that teachers as learning planners are required to be able to design learning process by utilizing various types of media and appropriate learning resources so that the learning process will become effective and efficient. Therefore, with the competencies and abilities possessed by teachers, teachers can develop active and effective learning, and can provide a motivational boost for students while learning.

To achieve the expected learning objectives, the process of transferring knowledge can be prepared at the teacher's house so that the learning process will not become saturated and will not make students stressed out. Teachers can optimize the use of appropriate learning media. Based on what Hamalik [12] stated, instructional media is one component of the learning system that has an essential role in supporting the quality of the teaching and learning process. This happens because learning media can increase effectiveness and efficiency in achieving learning objectives. The use of media in the learning process can attract and motivate students, and it can also improve students' mathematical reasoning abilities.

Based on the problems above, this research aims at finding out how the motivation and reasoning abilities of students through the use of Lectora Inspire-based interactive learning media in mathematics learning in primary schools.

2. Literature review

2.1. Lectora inspire-based interactive learning media

Suryani et al. [13] stated that learning media is all forms and means of delivering information that is made or used in accordance with the learning theory, can be used for learning purposes in channeling messages, and stimulating students' thoughts, feelings, attention, and willingness so that they can encourage a learning process that is intentional, purposeful, and controlled. The use of media in education conveys learning so that the learning process's objectives can be achieved. Sudjana and Rivai [14] defined learning media as a teaching aid in the methodology component as a teacher's learning environment. It can be concluded that the process of delivering messages requires an interactive and fun form of communication. Learning media is a form of communication in which there is a relationship or human interaction, reality, pictures, writing, and recorded sound. The five stimuli will make it easier for students to learn teaching materials.

In 2000, Lectora became the first certified AICC authoring system on the market. Lectora Inspire can be used to combine flash, record video, combine images, and screen capture [15]. Triviants Corporation developed Lectora Inspire as software for developing e-learning content or electronic-based learning. Lectora Inspire is used to create online courses, assessments, and presentations. It can also be used to convert Microsoft PowerPoint presentations and e-learning, and create online courses quickly.

According to Minkova [16], was ability to create interactions by using drag and drop, multiple tools for interactions such as lists and dictionaries section, built in themes, recording screen simulation with
the possibility of video re-cording and learning mode, improved sound editing functions, numerous advantaged features for adding script and variable, ability to direct student to specific learning units based on their assessment.

2.2. Students’ learning motivation
According to McDonald in Ambarjaya [17], motivation to learn is a change in energy in a person that is marked by the emergence of feelings and is preceded by a response to a goal. Areepattamannil et al. [18] also stated that motivation is the driving force or impetus to do a job, either from within or the outside. The essence of his statement implied that motivation is a psychological condition that encourages someone to do something. From the explanation above, it can be concluded that learning motivation is a condition that exists in a person where there is an urge to do something in order to achieve a goal.

Learning motivation consists of two elements, intrinsic and extrinsic elements. The intrinsic element is a push from within, while the extrinsic element is a push from the outside. Several ways can be used to foster motivation in learning activities among others are scoring; prizes; competition/competition; Ego-involvement; replicate; notify results; praise; punishment; the desire to learn; interests; recognized goals [19-21]. According to Butler [22] stated that the indicators of student learning motivation are the desire to learn, the encouragement and need for learning, the hopes and aspirations of the future, the appreciation in learning, the exciting activities in learning, and conducive learning environment. The learners will be keen to learn if they know there will be repetition or evaluation [19,20]. Therefore, giving a test or evaluation is also a means to increase or foster motivation in the lesson.

2.3. Reasoning ability
Mathematical reasoning is a logical thinking process in dealing with problems by following existing provisions [23,24]. The process of mathematical reasoning ends with a conclusion. Meanwhile, according to Suriasumantri [25], mathematical reasoning is a thought process in drawing conclusions in the form of knowledge and having certain characteristics in finding the truth. Mathematical reasoning is a thought process in drawing conclusions based on existing evidence and based on specific rules. Baroody [26] stated that reason is an important tool in mathematics and in daily life since many problems in mathematics and daily life requisite reasoning to solve then. It has the characteristics of logical thinking patterns according to specific patterns and frameworks.

The mathematical reasoning indicators, according to Sa'adah [27], are the ability to present mathematical statements through spoken, written, pictures, sketches, or diagrams; the ability to submit allegations; the ability to determine patterns; the ability to perform mathematical manipulation; the ability to justify multiple solutions; the ability to check the validity of an argument; and the ability to draw conclusions or make generalizations.

3. Methods
The method used in this research is quasi-experimental. Sugiyono [28] explained that this design has a control group but cannot fully function to control external variables that affect its implementation. The research design employed a non-equivalent control group design.

This research population was all fourth-grade students in the 2019/2020 Academic Year. This research samples were 46 fourth-grade students, separated into 23 students of the experimental class and 23 students of the control class.

The sampling technique used was the purposive sampling method, which was the technique of determining the sample with specific considerations [29]. The instruments used were tests and questionnaires. The test was used to measure students' mathematical reasoning abilities with a total of 10 questions in the form of essays and questionnaire sheets was used to see students' learning motivation.
4. Results and discussion
The following research data from the Lectora Inspire-based interactive learning media is a description of the application of the first to third meetings based on the observations in the experiment class. See table 1 and table 2 below.

Table 1. Learning motivation data.

| Information         | Control Group | Experiment Group |
|---------------------|---------------|------------------|
|                     | Initial Test  | Final Test       | Initial Test  | Final Test       |
| Total Students      | 23            | 23               | 25            | 23               |
| Greatest Value      | 84.7          | 81.22            | 68            | 82.9             |
| Smallest Value      | 64.8          | 60.84            | 57            | 75               |
| Average             | 75.6          | 65.92            | 62.54         | 79.71            |
| Standard Deviation  | 5.19          | 6.094            | 2.83          | 2.097            |

Table 2. Mathematical reasoning ability data.

| Information         | Control Group | Experiment Group |
|---------------------|---------------|------------------|
|                     | Initial Test  | Final Test       | Initial Test  | Final Test       |
| Total Students      | 23            | 23               | 25            | 23               |
| Greatest Value      | 77            | 70               | 64            | 77               |
| Smallest Value      | 17            | 20               | 18            | 23               |
| Average             | 44.42         | 42.94            | 38.22         | 52.5             |
| Standard Deviation  | 18.67         | 15.23            | 13.00         | 14.73            |

This research was conducted at elementary School, Garut. Two classes were sampled, namely class IV-B as the experimental class that was given treatment using Lectora Inspire-based interactive learning media and class IV-A as the control class that was not given treatment. The research subjects in the control class were 23 students, and the experimental class were 23 students. The two classes were given a pretest and posttest. The following results were obtained:

The pretest result of learning motivation of $t'$ was 57.15 and because it was not normally distributed then inferential statistics are used with a value of 2.073. Thus, the H0 reception area was between $-2.073$ and $2.073$. Because the $t'$ value was outside the receiving area of H0, then H0 is rejected and Ha is accepted.

While the post-test results' data analysis showed $t' = 10.42$ and because it was not normally distributed, inferential statistics were used with a value of 2.074. Thus, the H0 reception area was between $-2.073$ and $2.073$. Because the $t'$ value was outside the acceptance area H0, then H0 is rejected and Ha is accepted. Therefore, the research hypothesis of "there is a significant difference from the use of Lectora Inspire-based interactive learning media in experimental class students and control class students" was accepted. In other words, the use of Lectora Inspire-based interactive learning media affected students' learning motivation.

In this research, a gain test was also carried out to see the increase in students’ motivation. The average increase in the experimental and control class is shown in the table below.

Table 3. Normalized gain data.

| Group     | Total Student | Smallest | greatest | Gain  | Interpretation     |
|-----------|---------------|----------|----------|-------|--------------------|
| Experiment| 23            | 0.31     | 0.56     | 0.47  | Moderate           |
| Control   | 23            | -0.54    | 0.19     | -0.38 | There Was a Decline|
The table 3 above explained that there was an increase in students’ learning motivation in the experimental class. Meanwhile, based on the analysis of the pretest results on the comprehension of the concept, the value of $t'$ was 1.306, and because it was not normally distributed, inferential statistics were used with a value of 2.0738. Thus, the $H_0$ rejection area was between -2.0738 and 2.0738. Because the value of $t'$ was in the area of $H_0$ acceptance, then $H_a$ was rejected and $H_0$ was accepted.

Whereas in the data analysis results of the posttest of the comprehension of the concept, the value of $t$-count was 2.176 and the value of $t$-table was 2.015. Thus, the $H_0$ rejection area was not between -2.176 and 2.176. Because the $t$-count value was not in the receiving area $H_0$, then $H_a$ was accepted and $H_0$ was rejected.

Thus, from the data of the final test results from the two groups, it can be concluded that $H_0$ was rejected and $H_a$ was accepted. In other words, there was a significant difference in mathematical reasoning abilities between students in the control group and the experimental group.

A gain test was also carried out to see the increase in students’ learning motivation, and the average increase in the experimental and control classes is presented in the table below.

### Table 4. Description of normalized gain data.

| Group     | Total Student | Smallest | greatest | Gain  | Interpretation |
|-----------|---------------|----------|----------|-------|----------------|
| Experiment| 23            | 0.06     | 0.60     | 0.36  | Moderate       |
| Control   | 23            | -0.71    | 0.46     | 0.00  | Permanent      |

The table 4 above explained that there is an increase in students’ motivation in the experimental class.

The use of Lectora Inspire-based interactive learning media in mathematics subjects showed a positive influence on students’ learning motivation. It can be seen from the very prominent differences in the activities of the two classes, where the experimental class involved students using Lectora Inspire-based interactive learning media while the control class used varied lectures.

Based on the results of the analysis, it is clear at the first, second, and third meetings that the average scores of the experimental class using Lectora Inspire-based interactive learning media was better than the control class which only uses conventional learning. In other words, Lectora Inspire-based interactive learning media affected students' learning motivation and mathematical reasoning abilities.

Based on the average post-test score of the two classes, the average post-test score of the experimental class was higher than the average post-test score of the control class by using the t-test to prove whether there was a significant effect. By using a significance level of 5% or $= 0.05$, the result of the t-count was 2.176 and the t-table was 2.015. In other words, the t-count value was in the rejection area of $H_0$ and $H_a$ was accepted. This showed that there was a difference in mathematical reasoning abilities between students in the control group and the experimental group. The N-Gain test was also used to see the increase in students' mathematical reasoning abilities. From the N-Gain test, the average gain for the experimental class was 0.60, while for the control class was 0.46. The average gain value of the experimental class was greater than the control class. Based on the results of the t-test and from the improvement of the learning, the use of Lectora Inspire-based interactive learning media in the experimental class had a greater effect than the control class that did not use Lectora Inspire-based interactive learning media.

In the research conducted, students in the experimental class who used Lectora Inspire-based interactive learning media showed more improvement that can be seen from the average value of the comprehension of the concept. In other words, students become motivated to learn. Students’ attention was also more focused so it is easier to concentrate on receiving lessons.
5. Conclusion
This research examined the use of Lectora Inspire-based interactive learning media to increase motivation and mathematical reasoning of primary school students. Based on the results and discussion of the research, the following conclusions have been drawn:

- The application of Lectora Inspire-based interactive learning media could improve students' learning motivation and mathematical reasoning abilities.
- There were differences in learning motivation and mathematical reasoning abilities between students who got Lectora Inspire-based interactive learning media and those who did not get the learning media.
- Lectora Inspire-based interactive learning media affected learning motivation and mathematical reasoning abilities.

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