THE EFFECTIVENESS OF PORTFOLIO ASSESSMENT ON SCIENCE LEARNING OUTCOMES OF ELEMENTARY SCHOOL STUDENTS: A META-ANALYSIS

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ABSTRACT

The portfolio assessment is conducted by the collection of documents from students’ learning outcomes that are systematically organized by guidance to see students’ progress during the learning process. The process of learning science sustainable requires continuous observation to ultimately a product of science, in this case means in accordance with the concept of a portfolio assessment. The purpose of this research is to analyze the effectiveness of portfolio assessment on science learning outcomes elementary school students. The method in this research using meta-analysis. Data collection techniques in the study using a non-test beginning with formulating the research issues, search some of the relevant research results from electronic journals to be analyzed. The results of this research are obtained there are as many as 29 of the relevant journal are 9 articles. Based on the results of the analysis of the obtained the use of a portfolio assessment exert influence in measuring the results of student learning on science learning from as little as 1.16% up to 27.22% with an average of 13.95%. The study in this research can provide benefits that the portfolio as an alternative assessment options which can be used to improve the learning results of the science learning outcomes in the elementary school students.

KEYWORDS

portfolio assessment, science learning outcomes, elementary school, meta-analysis.

1. INTRODUCTION

Education continues to experience developments that can be seen from changes in the curriculum several times. This is inseparable from the assessment system applied in various schools. The learning process in schools refers to the extent of the quality of learning assessment so as to produce quality outputs as well. A proper learning is said to be of course quality apart from relying on the application of the curriculum, method approaches, models, etc. in the components of the teaching and learning process, another thing that influences is how the assessment is applied in the progress of knowledge gained by students.
Assessment is essentially the collection of information about student development which is carried out systematically to measure the ability of learning achieved (Jamaris, 2015: 43). In the assessment process, of course there are measuring activities, and this requires an appropriate evaluation tool so that the selection of the type of assessment used is needed.

There are many kinds of assessments in the learning process that are adapted to the teaching and learning process. Because not all learning processes are in accordance with the type of assessment chosen, for example, in science subjects that have the goal of learning to produce a work of science from students, continuous assessment is needed. It is because science is a subject that emphasizes the initial concept of students to produce a product in the form of work. Portfolio assessment is a collection of facts and documents in the form of individually organized tasks during the learning process (Sumantri, 2016: 79). Through portfolio assessment it is expected that the teacher can measure students' learning abilities appropriately so that they can take into account the progress made by each student. In portfolio assessment also allows the teacher to still be able to control the extent of student achievement in learning that is if in science subjects the most important is to assess the work produced by students. Because this assessment does not only involve students, but also involves parents, if in accordance with the steps, one of them is by compiling a complete rubric and also an assessment schedule.

The complete portfolio assessment steps according to Sumantri (2016) as follows involve students actively, determine the examples of work needed, the collection of student work, the preparation of rubrics and schedules, and the involvement of students' parents. Some of the steps in the process can not be separated from the name of the form of cooperation between students, because in producing a work or product of science there must be a form of cooperation or study groups. This is in accordance with the nature of learning science that can not be separated from the surrounding environment requires a form of cooperation, and in fact this form of cooperation is very effective to be used in science learning (Kartikaningtyas, Yulianti, & Pamelasari, 2014).

At the present science learning is also one of the subjects that elementary students tend to be less interested in and this makes the science still has the potential to continue to be developed with a variety of teaching and assessment innovations so that problems in teaching and learning can progress. The standard of teaching and assessment in learning science still lacks the productive potential of students (Zembal-Saul, 2009). One that needs to be developed is to involve students for example scientific practice and reasoning in the form of group collaboration. Direct student involvement in practice directly can also improve learning outcomes and can also increase student learning independence (Tsybulsky & Oz, 2019). To optimize learning, one of the appropriate types of assessment is portfolio assessment.

In accordance with the description and presentation, the focus of this study is whether the application of portfolio assessment can improve science learning outcomes in elementary school students?

2. METHOD

This type of research used in this study is a meta-analysis, which is a study conducted by researchers by summarizing some of the results of previous research, reviewing, and analyzing the research data. Data collection is done through Google Scholar search using portfolio assessment keywords, learning outcomes, and science learning. From the search results, 29 journals were obtained and there were 9 relevant articles from various online journals and repositories. The existence of data before and after the action in the form of scores becomes the basis for taking articles to be selected, then analyzed using qualitative descriptive analysis and quantitative

3. RESULT AND DISCUSSION

The results of the study were obtained from 9 relevant articles on portfolio assessment in the classroom with a variety of approaches and learning methods applied, then the data were
summarized quantitatively and descriptively qualitatively because the data obtained in this study were taken in essence because the data presented were still very broad. The following data is the result of the analysis:

Table 1. Result of Analysis of Portofolio Assesment on Science Learning Outcomes

| No | Researcher | Code | Percentage (%) | Pre-test | Post-test | Increase |
|----|------------|------|----------------|----------|-----------|----------|
| 1  | (Sewela, Dantes, & Tika, 2016) | X1   | 24.75          | 25.91    | 1.16      |
| 2  | (Tariani, Suarni, & Astawan, 2015) | X2   | 50.22          | 72.11    | 21.89     |
| 3  | (K. E. Wulandari, Suarni, & Renda, 2018) | X3   | 60.50          | 82.50    | 22.00     |
| 4  | (Purwani, Darsana, & Manuaba, 2018) | X4   | 33.00          | 55.00    | 22.00     |
| 5  | (D. A. P. H. Dewi, 2018) | X5   | 67.28          | 78.00    | 10.72     |
| 6  | (I. G. A. A. T. K. Dewi, Dantes, & Sulastri, 2013) | X6   | 22.94          | 31.53    | 8.59      |
| 7  | (P. Wulandari, Abadi, SE, & Suniasih, 2018) | X7   | 43.00          | 45.00    | 2.00      |
| 8  | (Utari, Ardana, & Darsana, 2015) | X8   | 73.00          | 83.00    | 10.00     |
| 9  | (Agustin, 2013) | X9   | 58.59          | 85.81    | 27.22     |
|    | Mean       |      | 48.14          | 62.09    | 13.95     |

Source: Google Scholar, 2013-2018

Table 1 shows that portfolio assessment can improve science learning outcomes of elementary school students. The results of the average percentage increase in students' science learning outcomes by using various approaches based on portfolio assessment from the lowest of 1.16% to the highest of 27.22% with an average of 13.95%. Before using various methods and approaches based on portfolio assessment, average student learning outcomes of 48.14% and after using portfolio assessment increased by 62.09%. In other words an increase of 13.59% can be seen from the results of different tests through calculations of output paired-sample T test:

Table 2. Paired Samples Statistics

| Mean | N   | Std. Deviation | Std. Error Mean |
|------|-----|----------------|-----------------|
| Pair 1 Pre-test | 48.1422 | 9 | 18.33177 | 6.11059 |
| Post-test | 62.0956 | 9 | 23.3239 | 7.77746 |

Table 3. Paired Samples Correlations

| N   | Correlation | Sig. |
|-----|-------------|------|
| Pair 1 Pretest & Posttest | 9 | .923 | .000 |

Table 4. Paired Samples Test

| Paired Differences | t     | df  | Sig. (2-tailed) |
|--------------------|-------|-----|-----------------|
| Mean               | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference |
| Low                | Up    |     |                 |
| -13.95333          | 9.55179 | 3.18393 | -21.29549 - 6.111800 | -4.382 | 8 | .002 |

In table 2 shows the application of various methods using portfolio-based assessment in natural science learning in primary schools can improve the learning outcomes of science from 48.1422 to
62.9056. The relationship between the average value of students' science learning outcomes before learning using portfolio assessments and after learning using portfolios is shown in Table 3.

Hypothesis test results $H_0 = \text{there is no significant difference in student science learning outcomes before learning using portfolio assessment}$, and $H_1 = \text{there are significant differences in students' science learning outcomes before learning using portfolio assessment and after using portfolio assessment}$. Table 3 shows the value of $\text{Sig (0.00)} < \alpha (0.05)$, then Table 4 shows that the value of $t_{\text{count}} = -4.382 < t_{\text{table}} = 1.833$. Thus $H_0$ is rejected. Thus it can be concluded that there are significant differences in students' science learning outcomes before learning using portfolio assessment and after learning using portfolio assessment.

Based on the results obtained in the form of analysis from various previous studies it can be seen that portfolio assessment using various approaches and methods used can improve the learning outcomes of science even though the results obtained are diverse. This can be influenced by many factors, for example related to factors in students such as health, intelligence, talent, interests, and others. In addition, external factors originating from outside students can also affect, for example, the school environment, family, and community environment. Moreover, the background of the research site from the research results obtained is also different so that it gives a different effect. The selection of various approaches and methods used in research can also have an influence on the percentage increase in student learning outcomes.

4. CONCLUSION

Based on the results of the analysis of the application of portfolio assessment can increasing student science learning outcomes from the lowest of 1.16% to the highest of 27.22% with an average value of 13.95%. For further research to be able to analyze more articles so that the data obtained is broader and can also be more in-depth as a result of relevant research.

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