Integrated model in science for elementary school

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Abstract. The interaction of the integrated learning model used in science lessons in elementary school did not necessarily have an impact on the outcomes of elementary students. It means that learning with the integrated model was not focused on students who had high motivation alone; learners who had low motivation could also obtain high learning results. The purpose of this research is to reveal the effect of the integrated model used by students. This research methodology used experimental research. The amount of contribution of motivation in improving learners' learning outcomes could be seen on the average learning outcomes obtained by learners who had high motivation in the experimental class was 86.2, while the learning outcomes of low motivated learners were 78.9. In the control class who had high motivation was 74.8 and average learning outcomes of learners who had low motivation were 63.1.

1. Introduction

Education is one of the decisive factors in efforts to improve human resources [1]. The government always tries to improve the quality and management of knowledge in various ways such as developing curriculum, facilities and infrastructure, learning resources, improving the quality of educators, as well as conducive learning climate [2, 3]. Beginning in 2013 the government implemented a new curriculum as a refinement of the KTSP curriculum in 2006. The 2013 curriculum used an integrated thematic approach. Integrated thematic learning was a learning approach that integrates the various competencies from various subjects into themes [4].

Primarily integrated thematic learning is developed to create education in which learners themselves are mentally active to build knowledge; based on the experience they have [5]. The successful use of this integrated thematic approach demands the ability of educators to apply it in the classroom learning process. A teacher has a significant role in determining the quality and quantity of teaching carried out in the learning process [6]. One of the most practical and realistic efforts in improving the quality of learning processes and learning outcomes of learners is the improvement and refinement of the learning system.

The fact in the field, thematic learning has been implemented because it refers to the book of teacher and student's book, but the learning process conducted by some educators still use conventional education that is the delivery of the material by the lecture and question and answer method, then ended by giving exercise in the form of questions. The role of learners who should be directly involved in the learning process only acts as a good listener. It makes learning less meaningful and impacts on less than optimal learning outcomes. The learner’s motivation also influences less optimal learning outcomes for learners. Educators mostly answer the tasks contained in the book students in question and answer activities. Learners quiet more and only hear the explanation from
educators; consequently they will lose the experience of direct and natural learning (direct experiences). Sensory experiences that form the basis of the general learning abilities of learners become untouchable, and it is a significant characteristic of the development of elementary school age children [7].

In line with this fact, Mudiono's [8] studied on the development of thematic learning models states that although educators had implemented the 2013 curriculum, most educators had no understanding of curriculum implementation and even the learning strategy itself. Also, the results of his research showed that students were less active in learning so that learning became less meaningful.

Educators are required to be able to choose, design and implement learning model by the characteristics of learners in the learning process, and foster learners motivation learn to improve the process and optimal learning outcomes. Learning models used by educators are not focused on thematic integrated only. Three models of integrated learning can be used in the elementary school such as connected model, webbed (theme) model, and an integrated model [9].

Researchers provide a solution to the above problems by applying the integrated learning model. Blended learning integrated model is learning that combines several subjects by prioritizing the concepts, skills, and attitudes that can be connected with each subject [10]. Through the integrated learning model, learners can gain hands-on experience, so it can add strength to receive, store, and apply the concepts they have learned. Thus learners are trained to be able to find themselves a whole range of ideas that are studied holistically, meaningfully, authentically and actively that improve their learning processes and outcomes. It is following the stage of cognitive development of elementary students.

The implementation of integrated learning using a blended learning model indicated that there was an increased understanding of learning for students [11]. To improve the quality of learning in elementary school to obtain optimal and meaningful learning outcomes, applied learning model centered on the involvement of learners and pay attention to the way of thinking. Learners themselves actively build knowledge based on the owned cognitive structure.

2. Method
The type of research was experimental research. This research includes quasi-experiment because the variables cannot be fully controlled as real experiments [12]. The kind of analysis used was Random Research Group Control. In this study, the learners grouped into two classes, the experimental class, and the control class. The experimental level is the class treated by the integrated model, while the control class is a class that uses the conventional approach to learning at the same time. Furthermore, at the end of the learning, the two groups were given the identical posttest that was the result of a learning test. The population in this study was all students of V MIN 1 Padang in the year of academic 2017/2018 consisting of 3 classes. The researchers took two sample classes in this study. The sampling technique used to determine the sample in this study was Simple Random Sampling (randomly). The first class selected was used as the experimental class, the V-A class and the second class selected to be the control class, the V-B class. Sources of data in this study were primary data sources obtained directly by researchers and sources of seconder data sourced from others. This study used three instruments: questionnaire learning motivation, test and observation sheet (assessment) for the attitude aspect of learners.

3. Result and Discussion
The learning outcomes of "animal and human circulatory organ" learners MIN 1 Padang City studied showed that learners who were taught by the integrated model both whole and groups of learners who had high motivation and groups of learners who had low motivation were higher than the learner who was taught by conventional learning model. Based on the prerequisite test the analysis obtained normally distributed data and had a homogeneous variance so that it was qualified to continue the hypothesis test. Hypothesis testing aims to see the treatment given to the sample research. Hypotheses 1, 2 and 3 used two path Anava test or use the F test. The hypothesis test results showed in Table 1.
Table 1. Results of variance analysis

| Varians Sources | SS       | df | MS     | \(F_{count}\)  | \(F_{table}\) | Annotation |
|-----------------|----------|----|--------|----------------|---------------|------------|
| Between treatment | 1.198,8  | 16 |        | \(F(1,60)=34.14\) | 4,00          | \(H_0\) accepted |
| Factor (A)      | 698.94   | 1  | 698,94 | \(F(1.60)=24.51\) | 4,00          | \(H_0\) accepted |
| Factor (B)      | 481.27   | 1  | 481,27 | \(F(1.60)=0.91\) | 4,00          | \(H_0\) rejected  |
| Factor AXB      | 18.62    | 1  | 18,62  |                | 4,00          |            |
| Within Treatment| 1.228,23 | 60 | 20.47  |                | 4,00          |            |
| Total           | 2.427,06 | 63 |        |                | 4,00          |            |

Based on the results of calculations in Table 1 by using two-way ANOVA test, the hypothesis could be described such as:

- **Hypothesis 1.** Based on the analysis results obtained \(F_{count}\) of 34.14 and \(F_{table}\) of 4.00 because \(F_{count}\) greater than \(F_{table}\), which is 34.14 > 4.00 then \(H_0\) is rejected, and \(H_a\) was accepted. It means that there was a significant difference between the learning outcomes of learners taught with an integrated model with the learning outcomes of learners taught with conventional learning model. Learning outcomes of learners taught with an integrated model were better than the learning outcomes of learners taught with traditional models.

- **Hypothesis 2.** obtained \(F_{count}\) of 24.51 and \(F_{table}\) 4.00 because \(F_{count}\) was bigger than \(F_{table}\), that was 24.51 > 4.00 then \(H_0\) was rejected, and \(H_a\) was accepted, this means there was a significant difference between learning result of learners who had high motivation with learners had low motivation. The learning outcomes of highly motivated learners in the two sample classes were better than the low-motivated learners' outcomes in both samples.

- **Hypothesis 3.** Based on the calculation results, \(F_{count}\) was 0.91, and \(F_{table}\) was 4.00, so \(F_{count}\) was smaller than \(F_{table}\) \((F_{table} < F_{table})\), that was 0.91 > 4.00 this means \(H_0\) accepted and \(H_a\) rejected, meaning there is no significant interaction between the integrated model and motivation to learners' learning outcomes on animal circulation animal and human organ.

3.1. Learning outcomes of students of circulatory organ material of animals and humans in experiment class and control class

The data of students' learning outcomes in this study were obtained through the final test of a written test in the form of multiple choice questions given to the experimental and control classes at the end of the learning process meeting, the results of the attitude assessment through self-assessment and assessment of partners and skills assessment through performance appraisal and products implemented in the learning process of each meeting. Description of data about students' learning outcomes aspects of knowledge, attitude, and skills can be seen in Figure 1.

![Figure 1. Average learners' learning outcomes overall experiment class and control class](image-url)
Based on known final test results given in both classes showed that the average value obtained in the experimental class was higher than the average grade of the control class. The experiment class maximum value was higher than the maximum amount of the control class. While the minimum value of experimental courses was also higher than the control class. The learning outcomes of the overall learners consisting of final test scores and attitude and skill assessment assessments can be seen in Figure 2.

![Figure 2. Average student learning outcomes overall experiment class and control class](image)

Based on Figure 2, the results of the study consisting of the final test, attitude assessment and students' skill assessments as a whole of the experimental class obtained the average, maximum and minimum values higher than the control class. Learning outcomes of learners based on high and low motivation in the experimental class and control class can be seen in Table 2.

| Classes  | X    | X max | X min | S    | S²   |
|----------|------|-------|-------|------|------|
| Experimental | 82   | 96.5  | 73.5  | 6.24 | 38.93|
| Control   | 76.9 | 87.5  | 67.5  | 4.93 | 24.29|

Table 3 shows that the average learning outcomes of experimental class students based on high motivation were better than average learning outcomes control class that had high motivation. Both high-motivated experimental and control levels had a higher average learning outcome than the low-motivated average learning outcomes of learners.

| Classes  | Motivation | X    | X max | X min | S    | S²   |
|----------|------------|------|-------|-------|------|------|
| Experimental | High     | 86.28| 96.5  | 84.5  | 5.8  | 33.49|
|           | Low       | 78.59| 84.5  | 73.5  | 3.4  | 11.53|
| Control   | High     | 80.97| 87.5  | 76.5  | 6.95 | 48.3 |
|           | Low       | 72.94| 77.5  | 67.5  | 3.93 | 15.43|

4. Conclusion
The learning outcomes of learners taught in the integrated learning model is higher than the learning outcomes of learners taught with conventional learning models. Learning outcomes of learners is who have high motivation higher than the learning outcomes of learners who have low motivation [13]. There is no significant interaction between the learning models Integrated with the motivation to learn
to learners' learning outcomes. The amount of contribution of motivation in improving learners' learning outcomes could be seen on the collective learning outcomes obtained by learners who had high motivation in the experimental class was 86.2, while the learning outcomes of low motivated learners were 78.9. In the control class who had high motivation was 74.8 and average learning outcomes of learners who had low motivation were 63.1.

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