Experiential Learning Model in Science Learning: Systematic Literature Review

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Abstract: This study aims to determine and describe the effect of the experiential learning model on science learning in elementary schools, namely by looking at the achievement of science learning objectives. The method used in this study is the Systematic Literature Review method. The search results found 244 articles from 2011 to 2023, and then were gradually and systematically selected into 15 articles that were relevant to the topic of experiential learning models in elementary school learning science and true/matching criteria. The results of this study indicate that there is an influence of the experiential learning model on science learning in elementary schools, as evidenced by the 15 articles studied being able to answer research questions, namely: How is the achievement of science learning objectives in elementary schools based on the results of a review of research articles on the experiential learning model?, and Does experiential learning affect the achievement of the goals of learning science in elementary schools? The results and findings in these articles indicate an increase in the achievement of science learning objectives after the implementation of this experiential learning model, namely: increasing students' curiosity and learning achievement, increasing students' motivation, increasing students' understanding of students, improving the quality of learning, increasing the competence of students, and making learning fun.

Keywords: Experiential learning; Science; Systematic literature review

Introduction

One of the learning objectives is not solely oriented to mastering the material by memorizing facts presented in the form of information or subject matter (Aisyah, 2021; Amri & Winsidi, 2022; Naomi, 2019). Furthermore, the real orientation of the learning process is to provide long-term experience (Holis, 2017; Millah, 2015; Supardi, 2017). With this concept, it is hoped that learning outcomes will be more meaningful for students. The learning process takes place naturally in the form of working and experiencing student activities, not the transfer of knowledge from teacher to student (Hidayat & Syahidin, 2019).

Science learning is expected to be a vehicle for students to learn about themselves and the environment, as well as the prospect of further development in applying it in everyday life (Andriana et al., 2020; Daniah, 2020; Fahrezi et al., 2020; Astuti, 2019). The science learning process carried out must be able to explore students' knowledge insights, foster the ability to think, work and be scientific and communicate them as important aspects of life skills (Julimah et al., 2020). Therefore, science learning in elementary schools emphasizes providing direct learning experiences through the use and development of process skills and scientific attitudes (Utariadi et al., 2021). One alternative learning model used to answer the above problems is to use an experiential learning model.

Experiential learning model is a learning model that is expected to create a more meaningful learning process, where students experience what they learn (Adnyana et al., 2022; Kastawaningtyas & Martini, 2017; Rohman et al., 2019). Through this model, students do not only learn about their material concepts, this is because students are directly involved in the learning...
process to be used as an experience. The results of the experiential learning process not only emphasize cognitive aspects, but affective and psychomotor aspects (Rufaida & Mubarokah, 2019) research results those who apply experiential learning in grade V elementary school in science subjects show that the use of this experiential learning model can improve the quality of learning so that it is recommended that it can be applied, especially to learning science.

Based on this, researchers are interested in conducting further literature reviews on the use of experiential learning models in science learning in elementary schools. The purpose of this study research is to determine and describe the results of research on the influence of experiential learning models (MPE) conducted in elementary schools on Natural Sciences (Science) subjects from year to year.

**Method**

Study this use systematic literature review, then in the collection data must be in accordance with research procedures Systematic Literature Reviews. Design procedure study Systematic Literature Reviews as following.

**Develop Research Questions**

Research questions that developed in this research, as following:

RQ1: How achievement objective learning IPA in school base based on results reviews article study about model Experiential Learning?

RQ2: Is the Experiential Learning model influential to achievement objective learning mathematics in elementary school?

**Selection Criteria**

The selection criteria on this study are shown in the following table.

<table>
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<tr>
<td>Criteria exclusion (rejection)</td>
<td>Journal study or work scientific in outside topic research. Publication before year 2010. Unfull text.</td>
</tr>
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</table>

**Developing the Search Strategy**

The search process is carried out using search engine (using google chrome) with the site address http://garuda.ristekdikti.go.id. Strings search needed for search which more specific and avoid filtering in that amount too big. String search in this research is: “Model pembelajaran berbasis pengalaman” or “Model experiential learning”.

**The Study Selection Process**

In the selection process studies namely process Where title and abstract article checked especially formerly For determine is study the relevant or No.

**Appraising the Quality of Studies**

In study SLRs, data which found will be evaluated based on question of quality assessment criteria as following:

QA1. Is article journal has indexed love?

QA2. Would the article write down the problem study Which relevant with this research?

QA3. Is on article use method study Which relevant for develop experiential models learning?

From each article journal, will give mark answer for each question in on with Y (Yes) or Q (No).

**Result and Discussion**

Article search results can be described as following.
Based on figure 2, the results of the findings explained as following.

**Developing the Search Strategy**

Based on figure 2, results findings in strategy search on site https://garuda.ristekbrin.go.id/ with strings in this research search, there are 244 articles found, but on the findings there is article which is same (duplicate) seen from title nor the author.

**Selection Criteria**

In Figure 2, the findings of the criteria acceptance selection (inclusion) and rejection (exclusion) from 229 article, article Which fulfill criteria reception namely 16 articles with acceptance criteria: (1) Topic experiential learning models or experiential learning model (MPP) on eye elementary science lessons, (2) Publication (2011-2023) and (3) Full text.

Article Which selected or rejected 229 articles, as for criteria exclusion, namely: (1) Outside topic model experiential I earning (MEL) or learning models based experience on eye lesson IPA elementary school, that is there were 229 articles that were rejected, and (2) Unfull text, there is 12 that article only provide the abstract only, so that article is rejected.

**The Study Process**

On this stage, article which fulfill criteria selection reception, furthermore be read title and the abstract for determine relevant topic of this research. From the findings at the stage, there are 15 article which relevant with this research and there were 12 articles that were rejected because the article was incomplete, it only consisted of an abstract, the full text could not be found or could not be accessed other than that the article Which considered not relevant because writer not include level education on title article while in the abstract it states level education, however no level elementary school, so the article is not relevant with study This.

**The Quality of Studies**

Result of quality studies that is there are 15 journals article fulfill criteria quality studies, proved with answer yes from all questions (QA1, QA2. QA3). This means that the journal articles in the table are indexed or included in national scientific journals, write down research problems related to the experiential learning model in science learning in elementary schools and journal articles write down the research methods used to develop experiential learning models.

**Synthesis Results**

Then carry out the data synthesis stage. The purpose of data synthesis is to collect evidence from selected studies to answer research questions. As for the question research (question research) and answers study as following.

RQ1. How are the objectives of science learning in elementary schools achieved based on the results of the article review study about model experiential Learning?

The review results of 15 journal articles about model experiential learning proven can reach objective science learning in elementary schools, proven with increasing mark or percentage beginning (before use model experiential learn ) with mark or percentage end (after use model experiential learning). In detail explained as following.

1st article on Name Haryanti et al. (2019) with the title "Application of the experiential learning model to improve science learning outcomes with hot themes and their transfer in elementary schools". This results of the study show that the Experiential Learning model implemented using the Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation steps can improve science learning outcomes on the theme of Heat and Transfer in class V of Elementary School 3 Waluyo in the 2018/2019 academic year, as evidenced with the percentage of mastery learning outcomes in the first cycle of 76.33% to 92.63% in the second cycle. However, there were several obstacles encountered during the implementation of this experiential learning model, including students who were less active in answering questions, had difficulty understanding the material, were embarrassed to present discussion results, lacked focus in learning, and had difficulty expressing opinions in clear language. Completion of the obstacles carried out by researchers is to reward active students, provide more guidance and supervision, appoint all group members to present the results of the discussion, and guide students when delivering opinions.

2nd article on behalf of Julinda et al. (2022) with title improving learning outcomes in theme 7 sub-theme 1 by using the experiential learning model in class V SD Negeri 200405 Hutaim Baru, Padang Sidimpuan sub-district Hutaim Baru, Padang Sidimpuan city. As for results on research the results of applying the Experiential Learning learning model can improve learning outcomes as evidenced by obtaining learning outcomes in each cycle. Increased learning outcomes where in cycle I with an average acquisition of 77.36. In cycle II, the average recovery value increased to 89.12, this proved an increase in learning outcomes in each cycle. This 2nd article is class action research.

3rd article on Name Alokafani et al. (2022) with the title "Application of experiential learning models to improve learning outcomes of fifth grade students at SD Muhammadiyah 1 Kupang city". Study This is a classroom action research (CAR) or study action keals.
In study This showing that there is the increase in learning outcomes using the experiential learning model in elementary schools can be seen from the learning outcomes in each cycle, in cycle I the average science learning achievement was 66.9% in the sufficient category. Furthermore, in cycle II, the average science learning outcomes were obtained by 80% in the very good category.

4th article on behalf of Fauzi et al. (2019) with title "Improvement of student learning outcomes using experiential learning models on the concept of light". Based on the results obtained during carrying out classroom action research, they have been described and analyzed so that it can be concluded that the experiential learning model can improve student learning outcomes. This is shown by the increase in the average value of student learning outcomes in each cycle. In cycle I it was 61.02, in cycle II it was 67.51, and in cycle III it was 76.82. The students' response to the experiential learning model in science learning on the light concept material was very high and positive. So, researchers recommend applying the experiential learning model as an alternative learning model to improve student learning outcomes, especially in science learning.

5th article on behalf of Utami et al. (2013) with title "The effect of the experiential learning model assisted by real object media on science learning outcomes for fourth graders of SD Cluster 1, Tabanan District". The results of this study found that: (1) the science learning outcomes of students who took the direct learning model showed an average score tended to be low, (2) the science learning outcomes of students who took the Experiential Learning model assisted by real object media showed an average score tended to be high, (3) there is a significant difference in students' science learning outcomes between the group of students who are taught with the Experiential Learning model assisted by real object media and the group of students who are taught with the direct learning model.

6th Article on behalf of Maisyaroh et al. (2018) with title "The effect of the experiential learning model on student learning outcomes at state elementary school 06 Pontianak Kota". Analysis of post-test results using the polled variance t-test shows the value of \( t_{\text{count}} = 3.312 \) > \( t_{\text{table}} = 2.0141 \). It means there are significant differences between student learning outcomes of the experimental class and the control class, so it can be concluded that there is an effect of the experiential learning model on student's learning outcomes. From the calculation of the effect size obtained 0.699 which means learning with experiential learning model gives a moderate effect on student's learning outcomes in Natural Science for grade IV SD Negeri 06 Pontianak Kota.

7th article in the name of Suryantini et al. (2021) with the title "Video-assisted experiential learning models influence the competence of science knowledge". Science knowledge competence data analysis using inferential statistics. The average post-test score of the experimental group was 80.067, categorized as good on the PAP scale of five and the control group was 72.375, moderately categorized on the PAP scale of five. The average of the experimental group is more than the control group. The results of the data analysis stated that \( t_{\text{count}} = 9.675 > t_{\text{table}} = 2.000 \) at a significant level of 5% with \( dk = 60 \) then Ho was rejected, which means that there were differences in the competence of science knowledge between groups of students who were taught through video-assisted experiential learning models and groups of students who were taught through learning conventional learning for fifth grade students. The general implication of this research is that this video-assisted experiential learning model can be used as an alternative for teachers in the learning process to improve students' competence in science knowledge.

8th article on behalf of Sagitarini et al. (2020) with the title "Experiential learning models assisted by concrete media affect the competence of science knowledge". The calculation results obtained an average of 69.421 in the experimental group and an average of 64.000 in the control group, and obtained \( t_{\text{count}} = 2.400 \) > \( t_{\text{table}} = 1.993 \) with a significance level = 5% and \( dk = 36 + 38 - 2 = 72 \), therefore the decision Ho was obtained rejected, so it can be concluded that the Experiential Learning model assisted by concrete media has a significant effect on the competence of science knowledge of elementary school students.

9th article on behalf of Imro'ah (2022) with the title "Efforts to increase understanding of the concept of simple electric circuits with experiential learning models in class VI SDN Plosokerep 2 Kota Blitar". Learning outcomes can be seen from 17 students who achieved completeness of only 7 students or 41% with a classical average value of 51. This value is due to a lack of learning by doing separate experiences and only using conventional learning methods. In this case, the sixth grade teacher conducts classroom action research with qualitative descriptive research, with a learning method that seeks to increase students' conceptual understanding, Experience-Based Learning Method (Experiential Learning) is a model of the teaching and learning process that activates learners to build knowledge and skills through direct experience.

10th article on behalf of Kusumawati (2021) entitled "Efforts to increase understanding of the concept of special characteristics of living things with experiential learning models in class VI SDN Bendogerit 2 Kota Blitar". The results of science learning by using the Experiential Learning model show progress in students' thinking abilities, finding a concept and adding to student experience. In the assessment of
learning outcomes it can be seen that the increase is: in the learning outcomes of completeness Cycle 1 is 55%, cycle 2 is 70%, and cycle 3 is 95%. In the results of increasing the average value experienced an increase in each cycle, namely cycle 1 reached an average value of 62, cycle 2 achieved an average value of 73, and cycle 3 achieved an average value of 90.

11th article on behalf of Hariri et al. (2018) with the research title "Application of the Experiential Learning Model to Improve Understanding of Light Matter and Its Properties for Grade 5 Elementary Students". The research results have increased. This can be proven by the increase in the average test scores and the percentage of student learning completeness from the pre-action, cycle 1, and cycle 2. The average student score in the pre-action was 72.2, the average student score in cycle 1 was 73.4, and the average score of students in cycle 2 was 79.3 while the percentage of student learning completeness in the pre-action was 47.4% with a low predicate, the percentage of student learning completeness in cycle 1 was 57.8% with enough predicate, and the percentage of completeness student learning in cycle 2 is 78.9% with a good rating.

12th article on behalf of Garinalis et al. (2018) with the title "Application of the experiential learning approach in science learning to improve critical thinking in elementary school students". The results showed that in the first cycle the students' critical thinking skills obtained 46.6% classical completeness, this showed an increase of 41.81% from the pretest results with 4.79% classical completeness. In cycle II it shows that students' critical thinking skills obtain 100% classical completeness. This study concludes that through the application of the Experiential Learning approach can improve students' critical thinking skills in learning science in grade V SDN Cipanengah CBM Sukabumi City in the 2017/2018 academic year.

13th article on behalf of Aprilia (2015) with the title "Implementation of experiential learning to improve the quality of science learning in grade V elementary schools". The results showed that there was an increase in the average student learning outcomes from cycle I to cycle II from 61.07 with learning mastery of 60.7% to 75.09 with learning completeness rising to 85%. And showing an increase in teacher skills, in cycle I the average teacher skills obtained were 3.11 with a percentage of 77.7% (good), cycle II increased to 3.5 with a percentage of 88.8% (very good).

14th article on behalf of Zuhryzal et al. (2019) with the title "Effectiveness of the experiential learning model on motivation and science learning outcomes. The result of hypothesis testing of the effectiveness of Experiential Learning model to natural science learning motivation showed that tcount > ttable (3.882 ≥ 2.037) and the result of learning showed that tcount > ttable (5.269 ≥ 2.037). It can be concluded that the implementation of Experiential Learning model is effective on the motivation and learning outcomes of science students of grade V on the subject.

The 15th article with the author's name Ratnaningsih et al. (2019) with the title "The Influence of Experiential Learning Models on Curiosity and Learning Achievement in Elementary School Science". Based on the research results of testing the curiosity variable hypothesis obtained value or 3.383> 2.024 a significance of 5% and dk = 38 then it is rejected and accepted, it is known that there is an influence of the experiential learning model on curiosity. Testing the hypothesis for the science learning achievement variable obtained a value of 3.351> 2.024 with a significance of 5% and dk = 38 then it was rejected and accepted so it was found that there was an influence of the experiential learning model on science learning achievement.

Of the 15 journal articles, it was proven that there was an increase in the achievement of science goals after the application of the experiential learning model in elementary school science learning.

RQ2. Does the Experiential Learning model affect the achievement of science learning objectives in elementary schools?

To see whether there is an influence or not from the Experiential Learning model on science subjects in elementary schools, it can be seen from the achievement of science learning objectives according to BNSP (2013) based on the results of a review of the articles, in a manner line big explained on Table 2.

<table>
<thead>
<tr>
<th>Table 2. Science Learning Objectives with Completeness Scores/Percentage</th>
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<tr>
<td><strong>Objective Science learning</strong></td>
</tr>
<tr>
<td>Increase Competence</td>
</tr>
<tr>
<td>Increase understanding Draft</td>
</tr>
<tr>
<td>Increase results Study</td>
</tr>
<tr>
<td>Increase Quality</td>
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<tr>
<td>Increase Ability Think Critical</td>
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</table>
The first objective is seen from Table 2, on learning that is improve competency, seen from average exists enhancement that is before applying the average experiential learning model value 72.36, after applied model experiential learning average value of 80.10. Data the prove that exists influence model experiential learning to eye lesson IPA in elementary schools namely on increasing the competence of participants educate.

Objective second science learning namely improve understanding of concepts, seen from average there is enhancement that is from average mark 73.4 increase become 79.3, with an average completeness of 56.4% to 86.95%. From the average data prove that there is influence model experiential learning to eye lesson IPA in school base, namely on the understanding of the concept.

Objective third that is increase results Study participant educate, seen from learning outcomes there is an increase. Before the application of the experiential learning model to the average value 68 with an average percentage completeness participant educate 71.61%, after the application of the experiential learning model has an average value of 83 with average percentage completeness participant educate 86.3% from whole. From data the seen that exists influence model experiential learning to eye science lessons in elementary school namely on the results Study participant educate. Furthermore, the purpose of learning science is to improve quality participant educate, seen from result exists enhancement from average percentage completeness participant educate 60.88%, after applied the average experiential learning model percentage increase become 82.04%. From data the seen that exists influence model experiential learning in science subjects at school base, that is in improve the quality of learning.

The final goal is to improve critical thinking skills participant educate, seen from result exists enhancement from average percentage completeness participant educate 4.79%, after applied the average experiential learning model percentage increase become 46.6%. From data the seen that exists influence model experiential learning in science subjects at school base, that is in improve critical thinking skills. From Table 2 above proves that there is influence model experiential learning to eye lesson IPA that is seen from the increase in achievement objective from eye lesson IPA after applying the experimental model learning.

Conclusion

Based on the results of a systematic literature review that has been carried out regarding the experiential learning model in elementary school science learning, the following conclusions can be drawn: Based on the results of a review of journal articles proving that there is an influence of the experiential learning model on science learning, which is seen from the increase in the achievement of the objectives of learning science after the implementation of the model, namely: increasing students' curiosity and learning achievement, increasing motivation of students, increasing students' understanding, improving the quality of learning, and increasing the competence of students and (6) learning becomes fun.

Author Contributions
Esti Susilonoingsih conceptualized the research idea, designed of methodology, management and coordination responsibility, analyzed data, conducted a research and investigation process; Mohamad Syarif Sumantri and Arita Marini conducted literature review and provided critical feedback on the manuscript.

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Conflicts of Interest
The authors declare no conflict of interest.

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