

Research Article

Development of Flipped Classroom Model with Differentiation Method (SQ3R) to Improve Critical Thinking Skills

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Abstract: This study aims to develop an effective classroom teaching model using the SQ3R knowledge differentiation method and to test the validity of the product as well as the benefits of the model. The method used in this research is research and development (F&E) that follows the Borg & Gall model consisting of 10 steps, which includes the first trial, corrections based on the trial results, field test, and survey and distribution of the product to support education in schools. In the development stage, the products were tested for validity and effectiveness. The results showed that validation from experts obtained an average score of 9.7 with the category “very valid.” In addition, the 1-1 trial resulted in an average score of 93.63% for the learning model, 102% for the material aspect, 98% for practicality, and 96% for benefits. All aspects were categorized as “very interesting,” “very easy,” and “very useful.” Based on these findings, it can be concluded that the Flipped Classroom learning model with the SQ3R differentiation method is proven effective in improving critical thinking skills of grade IV students in science subjects at SDN Klenang Lor 1. This model is also very feasible to be applied in science learning and has the potential to be adapted and applied to other subjects at the elementary school level.

Keywords: Development, Model, Product, Validation Results.

1. Introduction

21st century education emphasizes not only knowledge, but also skills that are essential in everyday life. The three main aspects identified by Island et al. (2021) are life skills, learning and innovation skills, and information media and technology skills. Education plays an important role in developing these skills to improve human well-being and contribute to national development. One of the most important skills in the modern era is critical thinking. Halim (2022) revealed that critical thinking is a core competency that implements the development of other skills. In this context, critical thinking enables students to disseminate information, solve problems, and make logical and well-founded decisions.

As part of formal education, developing critical thinking skills is the main goal that educators must achieve. These skills are essential for students to adapt to an ever-evolving world (D.V.P.M. Sari et al., 2021). In addition, the development of these skills also plays a role in science learning, where students can discover new concepts and improve their cognitive abilities (Rodríguez & Velastequí, 2019). However, despite its importance, the development of critical thinking skills in elementary schools is often hampered by students' lack of attention and active participation in learning, as found in observations at SDN Klenang Lor 1 in October 2024.

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This problem shows the need for a new approach to learning that can increase student engagement. One solution that can be applied is the Flipped Classroom learning model combined with the SQ3R method. Flipped Classroom moves traditional learning to a more active format, where students access the material first outside of class and then engage in discussion and application of the material in class. Meanwhile, the SQ3R (Survey, Question, Recite, Review) method helps students to better understand and recall information in a structured way. This approach is believed to increase student participation and their critical thinking skills (Sari et al., 2021; Alimah et al., 2023).

Based on observations at SDN Klenang Lor 1, the low critical thinking skills of students indicate that the current learning model used is not optimal. One of the strengths of the Flipped Classroom model is its ability to actively engage students, while the SQ3R method provides a structure that facilitates deep learning. Nonetheless, the weakness in its application lies in the need to refine the syntax in this model to better support individual students' cognitive development (Selmedani et al., 2021). Therefore, the researcher proposed the development of a Flipped Classroom model with a more integrated SQ3R method to overcome this challenge.

This research aims to develop a Flipped Classroom learning model using the SQ3R method to improve critical thinking skills of grade IV students in science subjects at SDN Klenang Lor 1, Probolinggo Regency. It is anticipated that, with the application of this model, students can be more active in the learning process, understand the material in depth, and improve their critical thinking skills. The main contribution of this research is the development of more effective learning methods at the basic education level, which can be adapted for other subjects.

2. Literature Review

Previous research has shown the importance of applying various learning techniques and methods to develop critical thinking skills in students at the elementary school level. Nadaban (2023) in a study entitled "Teaching Techniques and Methods to Develop Critical Thinking in Elementary Schools" emphasized the importance of integrating critical thinking methods in education through strategies such as problem solving, open-ended questions, and reflection, which can improve students' cognitive abilities and foster lifelong learning motivation.

Meanwhile, Avandra and Desyandri (2023) in their research entitled "Implementation of Differentiated Learning on Critical Thinking Skills" revealed that the implementation of differentiated learning proved effective in improving students' critical thinking skills, with a qualitative approach that focused on learning tailored to student needs.

In addition, Rahmi's research (2021) in a study entitled "The Use of Flipped Classroom Model to Improve Critical Thinking Skills Used SQ3R Method" states that the use of the Flipped Classroom model combined with the SQ3R method can significantly improve students' critical thinking skills. The research shows that the application of this model is effective, valid, and practical in improving students' critical thinking skills through a more interactive approach and based on independent understanding. All these studies show that the development of critical thinking skills through various innovative learning methods is essential to prepare students for the challenges of the 21st century.

From previous research, it appears that the use of methods such as Flipped Classroom and SQ3R can improve students' critical thinking skills. However, further research is needed to understand their impact more deeply, especially in the context of science subjects. Filling the gap, this study examines the effect of Flipped Classroom with SQ3R method on critical thinking skills of grade IV students in science learning. This research focuses on measuring the concrete impact of the combination of the two methods, providing specific empirical evidence of the improvement of students' critical thinking skills in the classroom.

3. Methods

This study uses a research and development (R&D) model that adapts the Borg & Gall (1983) approach, focusing on product development and validation. This model consists of ten stages: (1) research and information gathering through observation, questionnaires, and interviews, (2) planning which includes analyzing critical thinking skills, determining indicators and learning steps, and selecting learning models, (3) product development in the form of learning scenarios, teaching modules, and student activity sheets, (4) validation of material and learning model experts, and product revisions, (5) field trials on teachers and

students to measure the validity, practicality, and effectiveness of the product, and (6) refining the final product that is ready for use. The research subjects involved material experts, learning model experts, teachers, and fourth grade students of SDN Klenang Lor I, Probolinggo Regency. Quantitative data were obtained through questionnaires filled out by teachers and students, as well as material and learning model experts, which were analyzed descriptively, while qualitative data were obtained from suggestions and input to improve the product.

Data collection techniques in this study consisted of three types, namely questionnaires, process observations, and interviews. The questionnaire instrument was used to collect data from four groups of subjects, namely material experts, learning model experts, teachers, and students. Meanwhile, process observations were conducted by researchers to assess students' critical thinking skills during learning activities. Interviews were conducted to obtain information from the class teacher. The data collection techniques in this study consisted of three types, namely questionnaires, process observations, and interviews. The questionnaire instrument was used to collect data from four groups of subjects, namely material experts, learning model experts, teachers, and students. Meanwhile, process observations were conducted by researchers to assess students' critical thinking skills during learning activities. Interviews were conducted to obtain information from the class teacher.

4. Results and Discussion

This research produces a product in the form of a guidebook that applies the Flipped Classroom learning model with the differentiation method in learning science on the material of the five senses for fourth grade students of SD Negeri Klenang Lor 1. The products developed in this study will be tested through three types of analysis, namely validity analysis, practicality, and effectiveness. In the aspect of practicality, two assessments were carried out by teachers: first before the implementation of the research, and second after implementation, in order to assess the performance of researchers in designing research components. The data analysis technique of the questionnaire results for the three aspects uses the formula:

$$x = \frac{\Sigma X}{\Sigma Xi} \times 100\%$$

Description :

- x : Percentage Result
- ΣX : Score of All Statements
- ΣXi : Maximum Score
- 100% : Constant

Table 1. The results of the validity analysis are presented in the following table.

Data	Subject	Percentage	Categori
Product validity	Learning Material Expert Validation	93,63%	Very Valid
Product validity	Learning Model Validation	102%	Very Valid
Practicality	Teacher	Before: 94%	Practical
		After : 96%	
Effectiveness	Student	79%	Effective

In addition to using a questionnaire, researchers also conducted an interview with the homeroom teacher, Mr. Andi Fatwa Prasetyana, S.Pd., SD, regarding the learning model developed. The results of the interview were “In this learning activity, all students are actively involved because they are divided into several small groups that are adjusted to their respective cognitive levels. This gives greater responsibility to each student without depending on friends with higher cognitive levels. Thus, the aspects of cooperation and communication go hand in hand. This model is very suitable for IPAS lessons, because this subject emphasizes

the reasoning process of students. As a suggestion, if there is a further opportunity, learning should be more structured, especially in the application of Flipped Classroom-SQ3R. Each student should prepare a list of questions to ask, while the teacher stays in the group for a predetermined duration. That way, the teacher can be more directed and not confused if there are other groups who want to ask questions.” (Interview, February 3, 2025)

For process assessment, data is obtained from observations made by teachers and researchers during learning activities. This assessment focuses on the implementation of the Flipped Classroom learning model combined with the SQ3R (Survey, Question, Read, Recite, Review) differentiation method in order to improve students' critical thinking skills.

Table 2. The results of the assessment can be seen in the following table:

No.	Member	1	2	3	4	5	Effectiveness Results
1	Ega		•	•••		••	Frequently Appears Point 3
2	Ainun		•	•••	•		Often Appears Point 3
3	Aril		•	•••		•	Often Appears Point 3
4	Rara	•	••	•			Often Appears Point 2
5	Dede		••	••		••	Appears the same
6	Mila			•	•••		Point 4 appears frequently
7	Dodo			•	•••		Point 4 often appears
8	Tristan			•••	•	••	Often Appears Point 3
9	Faiz		•••	•	•••		Often appear point 2-4
10	Asya			•	•••		Often appears point 4
11	Iim			•	•••	•	Often appears point 4
12	Khonita			•••	•		Often Appears Point 3
13	Nouval			•••	•		Often Appears Point 3
14	Riski akbar			•••	•	••	Often Appears Point 3
15	Azam		•	•••			Often Appears Point 3
16	Fahmi			••	••		Appears the same
17	Fikri		••	••		•	Appears the same
18	Mario			••	••		Appears the same
19	Rafa			••	••	•	Appears the same
20	Zakaria		••	••		•	Appears the same
21	Halimah			•	•••		Often appears point 4
22	Sholeh			•	•••	•••	Often appear point 4-5
23	Melisa			•	•••		Often appears point 4

The results of the non-test assessment that refers to the indicators of creative thinking skills in the implementation of the learning model show that the points that appear most often are 3, 4, and 5, each obtained by 8 learners. Thus, there are 16 learners who often get points 3 and 4. Meanwhile, there are 6 learners who get the same number of points. The results of the implementation trial of this learning model development indicate that the Flipped Classroom learning model with the differentiation method (SQ3R) to improve critical thinking skills is an effective model and can be used in the learning process.

5. Conclusions

Based on the results of the research that has been conducted, it can be concluded that the Flipped Classroom learning model guidebook using the differentiation method (SQ3R) to improve critical thinking skills has advantages and disadvantages. The advantages of the Flipped Classroom learning model guidebook using the differentiation method (SQ3R) that has been prepared are as follows (1) makes learning easier for teachers, (2) Participants didik collaborate well with group friends, and (3) makes it easier for teachers to review learning steps well and design learning more effectively (4) Increases students' ability to develop life skills. In addition, the weaknesses are as follows (1) Learning must begin with sufficient preparation, (2) fourth grade students who are very active so that they still disturb their peers.

References

- [1] S. N. Alimah, S. B. Waluya, and A. Agoestanto, "Systematic Literature Review: Kemampuan Berpikir Kritis Matematis Siswa melalui Model Flipped Classroom," *SEMANTIK: Prosiding Seminar Nasional Pendidikan Matematika*, Nov. 2023, pp. 126–137.
- [2] A. Halim, "Signifikansi dan Implementasi Berpikir Kritis dalam Proyeksi Dunia Pendidikan Abad 21 Pada Tingkat Sekolah Dasar," *Jurnal Indonesia Sosial Teknologi*, vol. 3, no. 3, pp. 404–418, 2022. [Online]. Available: <https://doi.org/10.36418/jst.v3i3.385>
- [3] F. Island, G. Islands, Y. Fuke, T. Iwasaki, M. Sasazuka, and Y. Yamamoto, "福家悠介 1 ・岩崎朝生 2 ・笹塚 諒 3 ・山本佑治 4," *71*, no. 1, pp. 63–71, 2021.
- [4] C. Nädäban, "Teaching Techniques and Methods To Develop Critical Thinking in Elementary School," *Journal Plus Education*, vol. 33, Special Issue, pp. 218–226, 2023. [Online]. Available: <https://doi.org/10.24250/jpe/si/2023/cn/>
- [5] Rahmi, "Bab I Pendahuluan يا حض خ," *Galang Tanjung*, vol. 2504, pp. 1–9, 2021.
- [6] M. Rodríguez Velastequí, "No 主観的健康感を中心とした在宅高齢者における 健康関連指標に関する共分散構造分析 Title," *6*, no. 1, pp. 1–23, 2019.
- [7] D. V. P. M. Sari, K. Aini, Syarifah, F. Damayanti, T. Handayani, and A. Nurokhman, "Review: Berpikir Kritis Pada Peserta Didik," *Prosiding Seminar Nasional Pendidikan Biologi*, vol. 5, no. 1, pp. 104–111, 2021. [Online]. Available: <http://proceedings.radenfatah.ac.id/index.php/semnaspbio>
- [8] S. P. Sari, E. F. S. Siregar, and B. S. Lubis, "Pengembangan Pembelajaran Blended Learning Berbasis Model Flipped Learning untuk Meningkatkan 6C For HOTS Mahasiswa PGSD UMSU," *Jurnal Basicedu*, vol. 5, no. 5, pp. 3460–3471, 2021. [Online]. Available: <https://doi.org/10.31004/basicedu.v5i5.1334>
- [9] S. Selmedani, V. W. Septiana, and Y. L. Lasari, "Penggunaan Model SQ3R Untuk Meningkatkan Hasil Belajar Membaca Pemahaman Pada Peserta Didik Kelas IV SD," *Jurnal Kajian Dan Pengembangan Umat*, vol. 4, no. 1, pp. 55–66, 2021. [Online]. Available: <https://doi.org/10.31869/jkpu.v4i1.2657>