

DEVELOPMENT OF A METACOGNITION-BASED INQUIRY LEARNING MODEL ON SOCIAL NORMS MATERIAL TO IMPROVE STUDENTS' MOTIVATION AND LEARNING OUTCOMES

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Abstract. This study aims to develop the design of a Metacognition-Based Inquiry Learning Model, determine its feasibility, and test its effectiveness in improving students' motivation and learning outcomes on social norms material. The study employs a research and development (R&D) approach. Feasibility test data were used to determine students' mastery of metacognitive skills after the learning process. The collected data were analyzed using prerequisite tests, including normality, homogeneity, and hypothesis testing, based on pretest and posttest results. The assessment of students' learning motivation during the learning process showed that the highest motivation indicator was enthusiasm for learning, with a percentage of 82.20%. The results of the study indicate that: (1) the metacognition-based inquiry learning model can effectively improve students' motivation and learning outcomes; (2) cognitive achievement based on the metacognitive skills instrument showed good improvement in both sub-concepts. The posttest score for Sub-concept 1 was 73.33, categorized as sufficient, while Sub-concept 2 achieved a score of 90.00, categorized as very good; and (3) hypothesis testing of posttest scores showed a significance value of $0.000 < 0.05$, leading to the rejection of H_0 . Therefore, it can be concluded that the inquiry learning model has a significant effect on improving students' motivation and learning outcomes.

Keywords: Inquiry, Metacognition, Norm

I. INTRODUCTION

Thinking skills are skills that need to be possessed by students and are related to their ability to use learning techniques efficiently to acquire and apply new knowledge and skills [1]. Thinking skills are also related to students' ability to identify problems, design plans, make decisions, evaluate, and select the best alternatives [2]. These thinking skills are closely related to what is known as metacognitive ability [3]. Metacognitive ability is essential for students to use in the learning process so that learning objectives can be achieved [4]. This is reinforced by the Regulation of the Minister of Education and Culture (Permendikbud) Number 54 of 2013, which states that the graduate competency standards for junior high school students must meet knowledge qualification standards that include factual, conceptual, procedural, and metacognitive knowledge in science [5].

The implementation of learning that emphasizes training and empowering metacognitive skills is believed to make learning more meaningful, including in Civics Education (PPKn) learning [6]. Civics Education learning should focus on empowering and developing students' metacognitive skills [7]. The empowerment of metacognitive skills in Civics Education learning facilitates students' understanding of Civics concepts.

This is because metacognitive skills provide students with opportunities to think, plan, control, and reflect on their thinking activities during learning in order to solve problems. Metacognitive skills refer to individuals' knowledge of how to learn in ways that suit themselves, including predicting, planning, monitoring, and evaluating skills [8]. Metacognitive skills play an important role in various cognitive activities such as comprehension, communication, attention, memory, and problem solving [9]. These skills enable students to become independent learners who are capable of managing and evaluating their own thinking and learning processes [10].

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An alternative learning method that can address this issue is inquiry-based learning. According to Piaget's theory of cognitive development, junior high school students are at the

formal operational stage, enabling them to learn abstract and hypothetical concepts. However, they still require guidance in identifying problems, conducting investigations, and constructing concepts independently. Therefore, guided inquiry is considered appropriate, where the teacher acts as a facilitator rather than a director. The syntax of guided inquiry includes orientation, problem formulation, hypothesis formulation, data collection, hypothesis testing, and drawing conclusions, aligning with the scientific approach and supporting process skills development [14].

Inquiry-based learning is a student-centered approach that trains students' mental processes and metacognitive skills by providing opportunities to think, learn, and work independently [15]. Through inquiry learning, students become responsible for their learning progress and adapt learning strategies to achieve objectives. According to Sanjaya, inquiry-based learning emphasizes student activity, independent discovery, and systematic, logical, and critical thinking development [16]. Research findings show an average increase of 13.14% in students' metacognitive skills based on reflective journals [17]. Reflection is a systematic thinking process involving reviewing, analyzing, concluding, and setting learning goals. Students' metacognitive skills planning, monitoring, evaluating, and revising—can be assessed through self-reflection sheets [18]. Meaningful learning presents knowledge and cognitive processes that support problem solving, and guided inquiry begins with presenting phenomena to stimulate these skills [19]. The guided inquiry method also improves cognitive and affective learning outcomes by engaging higher-order thinking processes. Affective outcomes are measured using observation rubrics and questionnaires [20]. Improvements in affective learning outcomes indicate positive changes in students' attitudes and character development [21]. Guided inquiry stimulates curiosity, encourages exploration, problem solving, and critical thinking, and increases students' motivation and learning engagement [22].

The guided inquiry learning model can be applied to Civics Education materials that include facts, concepts, principles, and procedures [23]. Social norms material such as legal, religious, moral, and propriety norms is considered difficult for students due to its broad scope [24]. Therefore, social norms were selected as the learning topic to examine students' metacognitive skills through guided inquiry learning. Although inquiry learning and metacognition have been widely studied, their integration in Civics Education, particularly on social norms material, remains limited. This study addresses the research gap by integrating metacognitive strategies with guided inquiry learning to improve students' motivation and learning outcomes at SMP Negeri 1 Purwasari. The novelty lies in applying a metacognition-based inquiry learning model to social norms material and examining its simultaneous impact on motivation and learning outcomes.

II. RESEARCH METHODS

This study employs a research and development (R&D) approach. Research and development is defined as a research method used to produce a specific product and to test the

effectiveness of that product [25]. The research procedures applied in this development study were adapted from the development steps proposed by Borg and Gall. The data collection techniques used in this study consisted of test and non-test methods. The test techniques included pretests and posttests based on the metacognitive skills instrument developed by Zulfiani *et al.* [26], which comprised two types of questions: metacognitive skills and cognitive skills. The cognitive questions were presented in essay form and aimed to stimulate students' metacognitive skills. Meanwhile, the non-test techniques included observation sheets covering the activities of the researcher and the students, as well as teacher interviews. To determine the indicators of metacognitive skills in each subcategory, expert judgment was employed [27]. Data analysis is an activity carried out after data from all respondents or other sources have been collected. Quantitative data processing uses statistical analysis. The statistical analysis applied in this study aims to determine the effect of the guided inquiry learning model on the improvement of students' metacognitive skills [28]. The calculation of the percentage of metacognitive skills feasibility is conducted for each subcategory of metacognitive skills, namely planning, monitoring, and evaluation, while the calculation of the percentage of cognitive achievement is carried out for each learning sub-concept.

III. RESULTS AND DISCUSSION

The results of the research data analysis on metacognitive skills showed that the average pretest score obtained by students was 31.67, indicating that their metacognitive skills were still very low. The lowest pretest score was 3.57, while the highest pretest score was 64.29. The difference between the lowest and highest pretest scores was 60.72. Thus, it can be concluded that students' metacognitive skills were still very low. The low level of students' metacognitive skills is understandable, as the learning activities had not yet been implemented. The average posttest score obtained by the students was 68.81. The lowest posttest score was 50.00, while the highest posttest score was 85.71. The difference between the lowest and highest posttest scores was 35.71. The average posttest score showed an increase compared to the average pretest score. These data indicate that after the implementation of learning activities that support the improvement of students' metacognitive skills, the metacognitive skills achieved by students showed a significant difference.

In the first meeting, the process assessment used percentage-based criteria, in which the criterion of taking notes on the teacher's explanation obtained the highest percentage, namely 77.80%. Meanwhile, the lowest percentages were found in the criteria of participation in group activities and seriousness in completing tasks, both at 68.00%. In the third meeting, the results of the students' learning process assessment obtained a total percentage of 70.43%. The assessment of students' learning motivation, as reflected in the learning process, showed that the highest percentage among the learning motivation indicators was found in the criterion of enthusiasm for learning, reaching

82.20%. Meanwhile, the lowest percentage was in the criterion of seriousness in completing tasks, which was 69.80%. The total percentage obtained was 74.57%. Based on these data, it can be concluded that the metacognition-based inquiry method can improve students' learning motivation and learning outcomes in social norms material.

The purpose of including cognitive-based questions in the metacognitive skills instrument is to stimulate students' metacognitive skill processes. Sub-concept 1 and Sub-concept 2 showed good improvement. In the pretest, Sub-concept 1 obtained a score of 54.44, which indicates a poor criterion, while in the posttest Sub-concept 1 achieved a score of 73.33, indicating a sufficient criterion. The pretest score for Sub-concept 2 was 43.33, indicating a very poor criterion, whereas the posttest score for Sub-concept 2 was 90.00, indicating a very good criterion. Therefore, the Metacognition-Based Inquiry Learning Model on social norms material is feasible for improving students' motivation and learning outcomes.

The N-Gain calculation was used to show the improvement in students' metacognitive skills understanding. The N-Gain criteria are categorized as low if $g < 0.30$, moderate if $0.30 \leq g \leq 0.70$, and high if $g > 0.70$. The number of students with low metacognitive skills was 2, while the number of students with low cognitive skills was 5. Metacognitive skills are divided into three subcategories, namely planning, monitoring, and evaluation. Students showed the same N-Gain category, which was moderate, in both the evaluation subcategory for planning and the evaluation subcategory for monitoring. The results of hypothesis testing on the pretest scores showed a significance value of 0.602 (> 0.05); therefore, H_0 was accepted. This indicates that there was no significant effect on students' initial knowledge when guided inquiry was applied. Meanwhile, the results of hypothesis testing on the posttest scores showed a significance value of 0.000 (< 0.05); therefore, H_0 was rejected. Thus, it can be concluded that there is a significant effect of implementing the inquiry learning model on improving students' metacognitive skills.

IV. CONCLUSIONS

After the development research process was completed and the results of data analysis were obtained, conclusions regarding the metacognition-based inquiry learning model on the topic of social norms to improve students' motivation and learning outcomes were drawn as follows: 1) The metacognition-based inquiry learning model on the topic of social norms is able to improve students' motivation and learning outcomes. This is indicated by an increase in the average posttest score compared to the average pretest score. These data show that after students were provided with learning activities that support the improvement of metacognitive skills, the metacognitive skills acquired by students showed a significant difference. In the assessment of students' learning motivation, the results obtained during the learning process indicated that the motivation indicator with the highest percentage was students' enthusiasm for learning, reaching 82.20%. Based on these findings, it can be concluded

that the metacognition-based inquiry method can improve students' learning motivation and learning outcomes on the topic of social norms. 2) The metacognition-based inquiry learning model on the topic of social norms is feasible to be used to improve students' motivation and learning outcomes. This is shown by the results of the percentage of cognitive achievement in the metacognitive skills instrument, in which Sub-concept 1 and Sub-concept 2 both experienced good improvement. In the posttest, Sub-concept 1 obtained a score of 73.33, which falls into the *sufficient* category, while Sub-concept 2 obtained a score of 90.00, which falls into the *very good* category. Therefore, the metacognition-based inquiry learning model on the topic of social norms is considered feasible to improve students' motivation and learning outcomes. 3) The metacognition-based inquiry learning model on the topic of social norms developed in this study is proven to be effective in improving students' motivation and learning outcomes, based on the following results: a). The average posttest score of the cognitive questions in the metacognitive skills instrument achieved by students was 81.67. The posttest results indicate an improvement, showing that after the learning activities were implemented, the students' learning outcomes differed significantly. B). The hypothesis testing of the posttest scores resulted in a significance value of 0.000 (< 0.05); therefore, H_0 was rejected. Thus, it can be concluded that there is a significant effect of the application of the inquiry learning model on improving students' motivation and learning outcomes.

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