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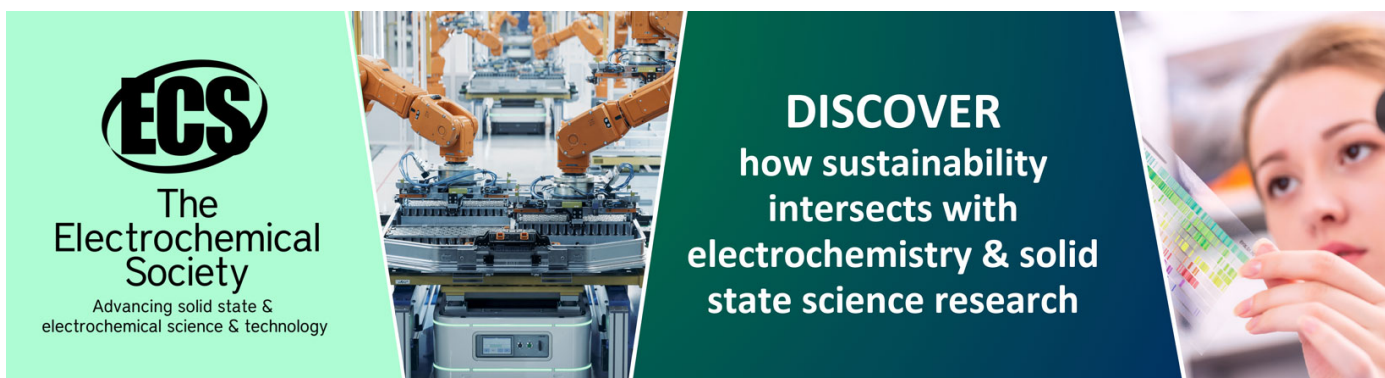
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The Development of HOTS- Basics Teaching Materials to Improve Student Analysis Skills

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Abstract The research aims to develop social studies basic concept teaching materials containing Higher Order Thinking Skills (HOTS) for college students of the Primary School Teacher Education Study Program. This research uses your Research Development (R&D) method and uses an experimental study using a one group pretest-posttest research design. This type of research is a quasi experimental research with one group pretest posttest design. The subjects of this study were students of STKIP Muhammadiyah Blora Primary School Teacher Education Study Program. The data collection instrument used was an assessment sheet for the quality of teaching materials, an analytically skill test, and a student response questionnaire. Based on data analysis, it can be conclude that: teaching materials based high-level thinking in the basic concepts of social studies course is stated to be practical and gets a response positive from students. Based on the expert's assessment, teaching materials are declared feasible and valid. Teaching materials have a positive effect on general activities and skills activities high level thinking. The used of teaching materials developed effective in improving the analytically skills of students.

1. Introduction

Thinking is something that must be done by man. In the current condition it is necessary to think broadly and deeply on various aspects. The effort to improve the quality of education can't be separated from the demands of 21st century competitiveness which is complex and challenging[1]. Various aspects have undergone very fast development, including in the world of education. Developments in the world of education cannot separated from various global influences such as the development of science and technology so the education system must also change. The quality of Indonesian education must be improved through learning activities carried out in schools and in universities as the main environment/place of the development of a science. Thus, we can make changes starting from the quality of learning found in universities. The learning system in the 21st century is the curriculum transition from teacher-centered learning to student-centered learning. Based on this, learning in the 21st century must provide skills to students, including: (1) Communication, (2) Collaboration, (3) Critical Thinking and Problem Solving, and (4) Creative and Innovative. Creative thinking skills are also needed for problem solving; They consist of problem finding, efficiency, flexibility, originality, and elaboration [1]

Education in Indonesia today are faced with some very strategic issues, among others: (a) learning should involve learners actively in finding and building knowledge through higher order thinking and



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inquiry, problem solving and collaborative work and collaborative learning [2]; (b) learners should possess the ability to think critically, to reason, to apply conceptual knowledge and procedures to solve problems, and presents the linkage concept of the material on lessons learned effectively and creatively [3, 4].

Quality learning will produce quality products and outputs as well, in this case is students. The students quality can be seen through how they respond to a situation or problem encountered in the surrounding environment and ultimately the discovery of problems. several problems in society must be solved using critical and creative thinking. Therefore, the quality of students must be improved through learning in college by applying higher order thinking skills (HOTS).

Higher-order thinking skills (HOTS) is the ability to connect, manipulate, and change the knowledge and experience owned critically and creatively in determining decisions to solve problems in new situations. HOTS is used to describe the student's cognitive activities out of the stages of remembering, understanding, and applying, such as at the stage of analyzing, evaluating, and creating [5].

But in reality, the Primary School Teacher Education Study Program students in this class in the basic concept social studies course have difficulty in answering some questions related to a given problem. Students only use one point of view in answering the problem solving given. This is because some of the teaching materials used have not been charged higher order thinking skills in which there is a special skill in analyzing an existing practice that trains them in high-level thinking, especially in the basic concept social studies course. The Basic Concept social studies Course of are required course in the Primary School Teacher Education STKIP Muhammadiyah Blora Study Program in this semester. HOTS included the skill to analyze and solve problems, criticize arguments, verify, make conclusions using inductive or deductive reasoning, assess and evaluate, make decisions, interpret and explore, predict, and the skill to see problems from different reviews [6]. Through HOTS, students can clearly distinguish an idea, argue well, be able to solve problems, be able to construct explanations, be able to hypothesize and understand complex things. People who think at a high level will be able to relate and conclude information that has been previously owned with the information they have just obtained so that they will develop this information to solve a problem at hand. The need to improve students 'higher order thinking skills is higher because developing these skills will diagnose students' more advanced levels of thinking, give students feedback about their level of thinking and encourage them to think in a better way, provide information to achieve educational goals, as well as conducting studies on how to teach higher order thinking skills [7].

The purpose of the research is to produce HOTS- Based Social Science Basics Teaching Materials that are valid, practical, and effective. Based on the description above, the researcher is interested in researching the development of Social Science Basics teaching materials based on high order thinking skills for college students Primary School Teacher Education Study Program

2. Method

The research uses the Research and development method, namely research that produces products and tests the effectiveness of the products produced [8]. Borg & Gall describes 10 steps in research and development [9]. Development method which Sukmadinata adapted into three stages, namely the exploration, model development, model testing, and model dissemination and implementation stages [10]. This research uses data collection instruments with test and non-test techniques. Test techniques is used the form of effectiveness test and non-test techniques in the form of expert validation sheets, and student responses. The validation sheet is used to obtain data on the quality of the teaching materials developed. The observation sheet is based on the HOTS theory. Questionnaires are questions to students about their responses, attitudes, and responses when using the teaching materials developed. The data analysis technique uses quantitative data analysis. This type of research is a quasi experimental research with one group pretest posttest design. This research does not use comparative classes but already uses pre test and post test so that the effectiveness or influence of HOTS-based learning on students' analytical skills could be known .

Subjects of this study were students of STKIP Muhammadiyah Blora Primary School Teacher Education Study Program. Research subjects are given a pre test to determine the students' initial abilities before using HOTS-based teaching materials. After being given the initial test, then the students were given treatment using HOTS-based learning. Furthermore, students are given a post test to determine the effectiveness learning using HOTS-based teaching materials on analytical skills. Analysis of the validity of teaching materials using four expert validators who assessment of the teaching materials developed, and then analyzed based on the average score.

Table 1. The average score of the validity of teaching materials

Score average	category
$1,00 \leq SV \leq 1,75$	Below average
$1,75 < SV \leq 2,50$	Average
$2,50 < SV \leq 3,25$	Good
$3,25 < SV \leq 4,00$	Very good

Table 1 is a category of scores for the validity of teaching materials obtained from the average assessment results of expert validators. Teaching materials are valid if the average score of teaching materials is in the minimal Good category. Analysis of the practicality of teaching materials is carried out by:

Observing the activities of students in learning activities. Determination of the average score of student activities in learning activities using the following formula:

$$RPD = \frac{\text{total score obtained}}{\text{total aspects}}$$

The score is obtained based on the results of the questionnaire filled out by students after learning using the teaching materials that have been developed. Teaching materials are said to be practical if students' responses to teaching materials are at least in the good category. The response categories of students can be seen in table 2.

Table 2. achievement of students' responses

The average score	category
$1,00 \leq RPD \leq 1,75$	Below Average
$1,75 < RPD \leq 2,50$	Average
$2,50 < RPD \leq 3,25$	Good
$3,25 < RPD \leq 4,00$	Very Good

The effectiveness of teaching materials was analyzed by effectiveness test. Completeness test is used to determine the classical completeness of students who are seen based on the post test results. The analytical ability of students is said to be classically complete if at least 75% of students achieve a minimum score of 75.

$$\text{Percentage of completeness} = \frac{t}{n} \times 100 \%$$

that:

t = total students score ≥ 75

n = total of students

The increase test is calculated using the gain normality formula based on the pretest and posttest values. The formula used is:

$$g) = \frac{\text{posttest score} - \text{pretest score}}{\text{maximal score} - \text{pretest score}}$$

The criteria for normalized gain are:

$0,0 \leq (g) < 0,3$ = low

$0,3 \leq (g) < 0,7$ = average

$(g) \geq 0,7$ = high

The analytical ability of students increases if the normalized gain reaches the moderate minimum category or $0,3 \leq (g) < 0,7$

3. Result and Discussion

The analysis in this study was to determine the application of HOTS teaching materials to students' analytical skills in terms of the validity, practicality, and the effectiveness of the teaching materials. The draft teaching materials were validated by 4 expert validators. The results of the assessment of the validator teaching materials got an average score of 3.45, so that the teaching materials developed are in the Very Good category. A device is called practical if it has been applied in the field and the level of implementation falls into the minimal Good category [11]. The results of observing student activities in learning activities got a score of 3.43 while the responses of students to teaching materials got a score of 3.53. Learning activities take place actively. Students discuss and convey ideas with various points of view and various kinds of answers and logical reasons, so that students give a positive response to the teaching materials developed.

Effectiveness relates to the level of success of the implementation of learning designed to achieve learning objectives [12]. The development of teaching materials is called effective if: 1) completeness level reaches a minimum of 75%, 2) there is an increase in the analytical ability between the pretest and posttest. Pretest and posttest results data can be viewed based on the following table.

Table 3. Pretest and posttest results

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	69.08	17	6.537	1.034
	Posttest	78.78	17	5.736	.907

Based on table 4, before using HOTS teaching materials, the average student got a score of 69.08, after using HOTS teaching materials, there was an average increase to 78.78. This shows that the application of HOTS-based teaching materials can improve student's analytical skills. Furthermore, a correlation test is needed which aims to determine the relationship between the results before using HOTS-based teaching materials and after using HOTS-based teaching materials. Correlation test results can be viewed based on the following table 5.

Table 4. Correlation Test Between Pretest and Posttest

		N	Correlation	Sig.
Pair 1	Pre test-post test	17	190	241

Based on table 5, it is found that the correlation coefficient of the analysis ability score in the basic concepts of social studies subject before and after being given treatment using HOTS-based teaching materials gets a score of 0.241 with a sig score of $0.000 \geq 0.05$ or not significant.

Furthermore, to determine the level of significance between before and after the use of HOTS-based teaching materials can be seen in Table 6.

		Paired Differences				95% Confidence Interval of the Difference		t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean		Lower	Upper			
Pair 1	Pretest Posttest	-9.700	7.835	1.239		-12.206	-7.194	-7.830	39	.000

Based on the table above, the difference in mean = -9,700 which indicates that the difference in the analysis ability of students before using HOTS-based teaching materials and after using HOTS-based teaching materials. Standard error mean which represents the standard error rate of mean difference. Furthermore, the statistical price $t = -7.194$ with df 39 and a significant number. P-value $0.000 < 0.05$ or H_0 is rejected. This shows that there is a significant difference in results between before using HOTS-based teaching materials and after using HOTS-based teaching materials.

Based on the results of the data collection, it shows that the development of HOTS-based teaching materials is effective in improving the analytical skills in the Basic Concepts of Social Studies course. In Indonesian, HOTS is known as higher order thinking skills and is an approach to learning to practice critical, logical, reflective, metacognitive, and creative thinking. The ability to think will arise when individuals find problems they have never encountered [13].

By training to think at higher levels, initially educator-centered learning becomes learner-centered learning. Students must be active to find something. While the task of educators is to be able to read the development of phenomena in order to develop, plan, and carry out a series of learning optimally in order to create a quality learning process.

4. Conclusion

The conclusions of this study are skills-based teaching materials high-level thinking in the basic concepts of social studies course is stated to be practical and gets a response positive from students. Based on the expert's assessment, teaching materials are declared feasible and valid. Teaching materials have a positive effect on general activities and skills activities high level thinking. The used of teaching materials developed by students as well effective in improving the analytical skills of students. To be able to develop better teaching materials there are several suggestions, and that is The development process and the pilot implementation takes a long time, the developer needs to plan schedule and manage time properly so as not to interfere other activities. This teaching material is not the only source and learning media, the addition of other media or teaching materials is still there needed in learning.

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