



Development of CTL Approach Learning Tools to Improve Critical Thinking Skills and Science Learning Outcomes of Class V Primary School Students

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Abstract

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The background to this research is that the learning methods used by teachers are still conventional, there is a lack of students' critical thinking skills so that students' learning outcomes decrease and there is a need for education that supports 21st-century learning as well as previous research that is reviewed and refined. This research aims to improve critical thinking skills and learning outcomes of class V students in science subjects at SDN Jatiroto 03. This research uses the development of learning tools which include LKPD, learning results tests, lesson plans, and teaching materials. Teaching materials and LKPD make it easier for students to understand food webs. The learning outcomes test questions contain HOTS (Higher Order Thinking Skill) questions which aim to increase student learning outcomes scores. The method used in this research is development or Research and Development based on the Four D Model with the development model consisting of four development stages, namely defining, planning, developing, and disseminating. The data collection procedures used are data collection procedures for CTL, observation to measure critical thinking skills, learning outcomes in the form of tests, and data collection processes for LKPD products and teaching materials. The data analysis method used is instrument testing, testing learning outcomes test questions, testing LKPD products and teaching materials. The results of this research show that the learning tools developed according to expectations meet the criteria for validity, practicality, and effectiveness so that learning tools using the CTL approach to improve critical thinking skills and student learning outcomes are suitable for use in science learning for fifth-grade elementary school.

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INTRODUCTION

The skill of thinking critically and logically is important in improving student learning outcomes through the CTL approach. It is very important to achieve the goals and targets of academic education in facing the 21st century. Students must be able to develop their cognitive aspects at the High Thinking Other Skill level of thinking. Student learning outcome scores are low because students' critical thinking skills are low so learning targets are not achieved. Education is designed to create students who are expected to have a more critical way of thinking to improve learning outcomes in class. The level of students' critical thinking is needed to support their students to be able to improve the problems that exist in life around society. Based on data from observations of the results of the theme 2 exam for class V students

in the science subject KD 3.2 regarding respiratory organs in humans, many children received low scores. The results of students' daily test scores show that the percentage of students who do not meet the completeness criteria is 59.26% and students who meet the completeness criteria is 40.74%, with the average percentage of classical scores in one class being 66.24%, while for the class VB results of students' daily test scores show that the percentage of students who did not complete was 74.08% and students who completed was 25.92%, with a percentage The average classical score in one class is 66.35%. This requires improvement in classroom learning to improve the learning outcomes of class V students in the science subject at SDN Jatiroto 03. The low critical thinking skills and science learning outcomes of students can be improved by developing tools. Contextual Teaching and Learning (CTL) approach to facing the 21st century.

This research aims to describe the process and results of developing CTL approach learning tools to improve critical thinking skills and valid, practical, and effective science learning outcomes for fifth-grade elementary school students. According to Johnson, (2014:57) CTL is learning that is relevant to the human brain because it produces meaning through the relationship of academic content with the background of children's daily lives. Using reality and believing in the environment can stimulate the brain's nerve cells to find a solution to one's problems and this system focuses more on the context of the problem rather than relationships.

According to Trianto, (2008:20-21), Contextual-based learning is a concept that can make it easier for teachers to relate or integrate learning material with real-life situations around students and encourage students to connect knowledge built initially and its application in their daily lives which involves seven components. Contextual main. According to researchers, contextual learning can be said to be a learning approach that recognizes and shows the natural conditions of knowledge through relationships inside and outside the classroom. A CTL learning approach makes the experience more relevant and meaningful for students in building knowledge that they will apply in living well learning.

The Four D Model is a research design that is often used by researchers in development research. This development model consists of four development stages, namely defining, planning, developing, and disseminating (Thiagarajan in Trianto, 2007; 65). In this research, the development of learning tools including LKPD, Evaluation Tools, RPP, and Teaching Materials was adapted only to the dissemination stage, so that the learning tools that had been developed were distributed to several schools in the Sumberbaru Gugus Jatiroto sub-district. This model was chosen because the stages are clear and by the needs for developing learning tools. Based on the expert opinion above, the application of developing learning tools, namely LKPD, evaluation tools/tests, lesson plans, and teaching materials can be carried out through CTL steps, namely by building knowledge (constructivism), finding (inquiry), asking (questioning), learning communities (learning community), modeling, and reflection. Some classic definitions of critical thinking, according to John Dewey and Reflective thinking (Fisher, 2008:3), actually someone who thinks critically shows an active and concrete process which is contrasted with a way of thinking where you don't just accept thoughts, ideas, and information. From others passively. According to Susanto (2015:5), learning outcomes are changes that occur in students, both regarding cognitive, affective, and psychomotor aspects as a result of learning activities. Mandasari, (2016:101) Development of Class V PKN Teaching Materials Oriented to the CTL Approach to Improve Elementary School Student Learning Outcomes at SD Lerpak 3 Bangkalan. Developing a CTL approach-oriented PKN textbook by

connecting material to the surrounding environment, will explore students' potential in the cognitive, affective, and psychomotor domains. Sadipun Berty, (2014:140) State University of Malang. Increasing social studies activities and learning outcomes through the STAD-type cooperative learning model based on Contextual Teaching and Learning for class IV A SDK Paupire Ende students. The research results show that the CTL-based STAD-type cooperative learning model can improve learning activities and student learning outcomes and learning using the CTL-based STAD model is more effective.

METHODS

This research uses a development research method or what is known as R&D (research and development) based on the Four-D Model. According to Thiagarajan in Trianto, 2007:65, the Four-D Model is a development model consisting of four development stages, namely defining, planning, developing, and disseminating. The type of research used in this research is development research referred to as R&D (research and development) based on the Four-D Model. Development research is research that uses strategies or methods to improve. This research is a process or steps to develop new products or to improve existing products that can be accounted for (Sukmadinata, 2005; 164). The design of this research refers to the Four-D Model. This development model consists of four development stages, namely defining, planning, developing, and disseminating (Thiagarajan in Trianto, 2007; 65). In this research, the development of learning tools for the dissemination stage was carried out in several schools in the Sumberbaru Gugus Jatiroto sub-district, because the dissemination or dissemination process was appropriate to the research institution and also did not take too long or cost too much. This model was chosen because the stages are clear and by the needs for developing learning tools.

RESULTS AND DISCUSSION

The discussion is related to the validation results used, including that the LKPD is prepared, planned, and designed to make it easier for students to achieve learning goals systematically. Student worksheets are planned and designed systematically. This learning tool is equipped with test and reflection exercises to review material that has been studied previously. The level of validity is measured by a rating scale which is interpreted in a qualitative sense starting from obtaining numbers. The results of the LKPD validation show an average value of 4.21 which shows the criteria are very valid with a table of validation results for each aspect as follows:

Table 1.1 LKPD Validation Results

Aspects	Score	Criteria
Cover Design	4	Very Valid
Content Design	4,67	Very Valid
Contextual LKPD	4,16	Very Valid
Material Completeness	4,25	Very Valid
Material Content	4	Very Valid

Because all aspects of the assessment are in the very valid category, the LKPD is very suitable to be used to improve student's critical thinking skills and student learning outcomes in class V science subjects.

The beginning of learning activities with LKPD using the CTL approach is used in food chain science material which begins with activities observing the surrounding environment which builds the students' initial knowledge. Following the presentation of the learning material, students are allowed to ask questions if there is something they do not understand. In the next lesson, students are allowed to discuss independently so that students share ideas, thoughts, and knowledge with their friends. The final component in the learning process using the CTL approach is the emphasis on important things, students are given the opportunity to conclude the material they have studied (reflection), where in this activity students will be assessed on their learning outcomes through reflection and test results activities contained in the questions. Exercise. After learning activities using LKPD with the CTL approach, researchers tested the level of practicality of LKPD through student response questionnaires which were distributed individually. The practicality criteria for the LKPD were met with positive student responses obtained in each statement showing a score above 4 with the statement agreeing. So a total score was obtained, namely 61.38 with an average of 4.38 which was included in the positive category.

Table 1.2 Response Criteria for the Practicality of CTL-based LKPD

No.	Statement to	Score	Criteria
1.	1	4,82	Agree
2.	2	4,82	Agree
3.	3	4,53	Agree
4.	4	4,82	Agree
5.	5	4,17	Agree
6.	6	4,46	Agree
7.	7	4,25	Agree
8.	8	4,21	Agree
9.	9	4,39	Agree
10.	10	4,28	Agree
11.	11	4,32	Agree
12.	12	4,53	Agree
13.	13	4,46	Agree
14.	14	4,32	Agree
	Total	61,38	Average = 4,38

Previous research conducted by Nurul Noviani (2011) stated that if the average score obtained from the analysis of student response questionnaires was around $2.5 = X_i = 3.5$, then the LKPD was included in the good qualitative criteria. This means that the LKPD based on the CTL approach used by students is achieved and practical.

The effectiveness of the products made can be seen from the learning outcomes tests given to students in the form of post-test questions. According to previous research conducted by Aminullah (2013), learning outcomes tests were also carried out to measure the achievement of basic competencies and indicators for learning using the modules developed. The trials that have been carried out show that the effectiveness criteria have been achieved with the number of 24 students achieving completion, around 96%. From the results of the test, it was found that the average overall student learning outcomes were above the KKM, namely 81.60%. This proves that students can absorb lessons well by using LKPD based on the CTL approach that

was developed. The effectiveness of using LKPD is also influenced by students' responses to using LKPD. During the direct learning process, students are very enthusiastic because there is a competency test accompanied by interesting pictures contained in the LKPD so that students do not feel bored with the existing lessons, it makes it easier for students to understand the material, and students are more motivated to learn by using LKPD based on CTL approach.

The CTL Approach-based learning outcomes test is an evaluation tool that is equipped with a grid of questions that have been tested and contains contextual elements to stimulate students to think critically which can foster critical thinking skills and improve students' learning outcomes. The level of validity of this research is measured using a rating scale where the raw data obtained is in the form of numbers and then interpreted in a qualitative sense. Based on the results of observations from the theoretical description, it states that the value of the validation results from the two validators ranges from $3.5 = M = 4$.

Table 1.3 Validation results of learning Outcomes tests

No.	Aspects	Score	Criteria
1.	CTL based	4,60	Very Valid
2.	Critical thinking grid	4,35	Very Valid
3.	Contextuality of the test	4,40	Very Valid
4.	Material Completeness	4,25	Very Valid
5.	Fill in the learning outcomes test	4,20	Very Valid

The average aspect of the learning outcomes test developed shows an average score of 4.36 which is in the very valid category, so the learning outcomes test can be used in further development, namely field trials in classroom learning and then measuring its practicality and effectiveness.

The level of practicality of learning outcomes tests through student response questionnaires distributed individually. Practicality criteria are met if the assessment category is in the positive category for all the statements given.

Table 1.4 Practicality of Learning Outcomes Tests

No.	Statement to	Score	Criteria
1.	1	4,35	Agree
2.	2	4,50	Agree
3.	3	4,60	Agree
4.	4	4,35	Agree
5.	5	4,30	Agree

The total score obtained was 22.10 with an average of 4.42 so it can be concluded that the learning outcomes test meets the practicality criteria with the student response questionnaire being in the positive category.

The effectiveness criteria were achieved with the number of students achieving completeness as many as 24 people or around 96%. From the results of the test, it was found that the average overall student learning outcomes were above the KKM, namely 81.60%. This proves that students can absorb lessons well by using LKPD based on the CTL approach that was developed.

CTL Approach-based RPP is an RPP that is equipped with CTL-based learning steps and also includes critical thinking skills in each learning step carried out by the teacher during the learning process. The level of validity is measured using a rating scale where the raw data obtained is in the form of numbers and then interpreted in a qualitative sense. Based on the observations from the theoretical description above, it states that if the validation results from the two validators range between $3.5 = M = 4$ then the RPP developed meets the very valid category.

Table 1.5 RPP Validation Results

No	Aspects	Score	Criteria
1.	CTL based	4,12	Very Valid
2.	Loading CTL step	4,80	Very Valid
3.	Contextuality of lesson plans	4,65	Very Valid
4.	Completeness of RPP	4,25	Very Valid
5.	Fill in RPP	4	Very Valid

The average value of the RPP aspect developed is 4.36 which is in the very valid category, so the RPP can be used in learning and then measure its practicality and effectiveness.

Table 1.6 Practicality of RPP Results

No	Statement To	Score	Criteria
1.	1	4,80	Agree
2.	2	4,80	Agree
3.	3	4,50	Agree
4.	4	4,30	Agree
5.	5	4,35	Agree

Researchers tested the level of practicality of the RPP through student response questionnaires that were distributed individually. The total score for all statements to measure the practicality of the lesson plan is 22.75 with an average of 4.55 which is in the positive category with student responses agreeing, so the lesson plan is included in the good qualitative criteria. This means that the lesson plans based on the CTL approach used by students are practical. In this way, the practicality criteria for RPP based on the CTL approach are achieved.

Based on the trials that have been carried out, the effectiveness criteria were achieved with the number of students achieving completeness as many as 24 people or around 96%. From the results of the test, it was found that the average overall student learning outcomes were above the KKM, namely 81.60%. This proves that students can absorb lessons well by using lesson plans based on the CTL approach that was developed. The effectiveness of using lesson plans, apart from being supported by learning outcomes tests, is also influenced by students' responses to the use of LKPD. During the learning process, students are very enthusiastic because there is a competency test accompanied by interesting pictures contained in the LKPD, so that students do not feel bored with the existing lessons, it makes it easier for students to understand the material, and students are more motivated to learn by using lesson plans. Based on the CTL approach.

Teaching materials based on the CTL approach are teaching materials that are equipped with very complete and varied material from various sources and are also equipped with a reflection section to reflect on the material that has been learned during the learning process in class. In this research, the level of validity is measured using a rating scale where the raw data obtained is in the form of numbers and then interpreted in a qualitative sense. Based on the results of observations from the theoretical description above, it states that if the validation

results from the two validators range between $3.5 = M = 4$, then the teaching materials developed meet the very valid category because the aspects of the teaching materials developed show an average value. 4.16 which is in the very valid category, based on previously determined criteria.

Results Table 1.6 Validation of Teaching Materials

Aspects	Score	Criteria
Cover Design	4,20	Very Valid
Content Design	4,35	Very Valid
Contextual Teaching Materials	4,15	Very Valid
Material Completeness	4,10	Very Valid
Material Contents	4	Very Valid

Because all aspects of the assessment are in the valid category, the teaching materials can be used in further development, namely field trials in classroom learning to then measure their practicality and effectiveness.

Table 1.7 Results of Practicality of Teaching Materials

No.	Statement to	Score	Criteria
1.	1	4,50	Agree
2.	2	4,70	Agree
3.	3	4,85	Agree
4.	4	4,82	Agree
5.	5	4,32	Agree

Researchers tested the level of practicality of teaching materials through student response questionnaires that were distributed individually. The total score is 23.19 with an average of 4.63 which is included in the positive category with the category agreeing with each statement, so the teaching materials are included in the good qualitative criteria. This means that the CTL approach-based teaching materials used by students are practical. In this way, the practicality criteria for teaching materials based on the CTL approach are achieved.

Based on the trials that have been carried out, the effectiveness criteria were achieved with the number of students achieving completion as many as 24 people or around 96%. From the results of the test in Table 4.4, it was found that the average overall student learning outcomes were above the KKM, namely 81.60%. This proves that students can absorb lessons well by using teaching materials based on the CTL approach that was developed. The effectiveness of using these teaching materials, apart from being supported by learning outcome tests, is also influenced by students' responses to the use of the module. During the direct learning process, students are very enthusiastic because there is a competency test accompanied by interesting pictures contained in the module, so that students do not feel bored with the existing lessons, it makes it easier for students to understand the material, and students are more motivated to learn by using the materials. Teaching based on the CTL approach.

Table 4.1 Results of Validity, Practicality and Effectiveness

No.	Device Researcher	Target Learning	Validity	Practicality	Effectiveness
1.	LKPD	4	4,67	4,38	81,60%
2.	Evaluation/Test Tools	4	4,36	4,42	81,60%

3.	lesson plan	4	4,36	4,55	81,60%
4.	Teaching materials	4	4,16	4,63	81,60%

From this table, it can be seen that the researcher gave the initial target benchmark for CTL-based learning tools, namely 4, and the score obtained for each aspect of the learning tools was more than 4, so it can be concluded that the CTL-based learning tools developed are valid, practical and effective which can improve skills. Critical thinking and learning outcomes.

CONCLUSION

a. Validity

Based on the validation of the expert team for, 1) the validation results of the LKPD which were validated by the expert team with a total average of 4.21; 2) the results of the validation of student learning outcomes tests with a total average of 4.16, 3) the results of the RPP validation with an average of -total average 4.36, 4) results of validation of teaching materials with a total average of 4.36, and 5) validation of learning outcomes tests where the expert team stated they were valid. The total mean value is $4 \leq Va \leq 5$. So referring to the validity criteria the device is in the validity criteria with the "very valid" category. The results of the validity of these learning tools can improve critical thinking skills and student learning outcomes in class V social studies subjects.

b. Practicality

The learning tools that have been validated by a team of experts state that what has been developed can be applied or used in the field with little or no revision. Furthermore, the results of interviews conducted with students regarding the learning tools developed, show that students are helped and find it easy to use the learning tools. So referring to the practicality of learning tools using a problem-based learning model fulfills the practicality category. With the results of the practicality of the LKPD, an average value was obtained of 4.38 in the very practical category, the practicality of the learning outcomes test obtained an average value of 4.42 in the very practical category, the practicality of the lesson plan obtained an average value of 4.55 in the very practical and practicality category. The teaching materials obtained an average value of 4.63 in the very practical category. This proves that the learning tools in this research can improve critical thinking skills and learning outcomes for class V students in science subjects.

c. Effectiveness.

Based on indicators of effectiveness, namely: 1) the teacher's ability to manage learning with a total average of 3.53 in the "fairly good" category, 2) Achievement of the percentage of ideal time for student activity within the achievement of ideal time for student activity with a time tolerance of 5%, 3) Average -The average classical completeness result of student learning is 81.61% so that it meets the criteria for classical completeness, 4) Student responses show a "very positive" response.

So the CTL approach learning tool for improving critical thinking skills and student learning outcomes is suitable for use in social studies learning for fifth-grade elementary school.

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