MECHANISM OF ASSESSMENT...

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MECHANISM OF ASSESSMENT AND REFLECTION ON THEMATIC ASSIGNMENT FOR STRENGTHENING OF CRITICAL THINKING AND DEMOCRATIC ATTITUDES IN LEARNING

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Abstract

This article describes the impact of reflection that was preceded by intragroup and intergroup peer assessment, to improve the students work on thematic assignment instruction of water cycle. Reflection is done based on the classification of the material tasks such as: description of facts and phenomena, the relationship between the concept and context, the process of science, the formulation of concept network, and the social implications of the thematic assignment. Students are being targeted are high school students in Manganitu and Tamako, in Sangihe regency. The results showed that the assessment and reflection positively influence to improve student work on material that students have an early experience and basic knowledge. Constraint in reflection and knowledge construction of students was the lack of mastery of concepts and the relationships between concepts and context. The results of the study recommend the importance of continuity of materials and learning activities to enable students construct knowledge based on experience, while developing critical thinking skills.

Keywords: Thematic Assignment, Instructions, the Water Cycle, Peer Assessment, Reflection.

Introduction

The results of the initial survey (Raturandang, 2013) shows that learning in Sangihe is still centered on the teacher (Medellu, 2013; Marpaung 2014), and only emphasizes the concept that originates from the textbook (Tumangkeng, 2013; Rende, 2013). This is related to learning orientation to meet the demands of final exams (Medellu, 2013; Raturandang, 2013). Learning utilize resources from the surrounding environment that enables the process of science has not been implemented (Tumangkeng, 2013; Rende, 2013). Students are not faced with the facts of science learning that exist in the environment. Learning materials in the classroom and homework given to students only concerned with concepts. The task assigned by the teacher is not done optimally (Raturandang, 2013). The survey shows that the problem of learning in Sangihe is not only related to the substance or learning materials and teaching methods but also the behavior of student learning.

Thematic learning students confront the facts and phenomena that exist around the students. The substance or instructional materials made possible the science process potentially more attractive to students, as it relates to the experience and problems faced in everyday life. Learning design in the form of thematic instruction is done by choosing a theme related to the lives of students in order to ensure students' attention and love of learning content. Integrated thematic instruction across subjects, provide flexibility to teachers to design instruction according to the needs of children by utilizing a multi-source learning (Wood, 1997). Thematic instruction can encourage the development ability of a compound (multiple intelligence) because it involves skills such as reading, thinking, remembering or writing a real life context that can encourage creative exploration. (Fogarty, 1997). Barton and Smith (2000) suggested that the integrated thematic instruction in the unit theme, enabling the authentic assessment.

Object thematic learning the real world around students, focuses on learning activities conducted outside the classroom. Instructions executed thematic learning outside the classroom, can be designed to observe activities that vary (Pendrill, 2005). Through thematic instruction outside, students can analyze the relationship between the facts with conceptual knowledge (Bransford et al, 1999), to exchange experiences with other students (Krogh, 1990) in a process of building knowledge more complex and complete. Higgins (2002) suggested that learning outside the classroom enhance their knowledge and understanding of natural systems and processes ultimately establish responsibility towards the environment.

Our team developed a research thematic learning in the form of thematic assignment instructions are implemented outside regular instructional hours in class. Stages of research include (1) a basic instructional design, (2) development plan with the participation of teachers, students, and parents, (3) implementation of the plan involves the role of parents, and (4) evaluation. This thematic task implementation is flexible. Instructions thematic task designed and developed based on the principles of democratic learning. Democratic schooling or learning needs the support of all personnel involved in the management of the school (Ozcan, 2005). Parents play an important role in the learning process of democratic child (Bekoe and Quartey, 2013). There is six category of participation of parents / community to education namely: strengthening, partnership, interaction, consultation, provision of information, and manipulation (Aref et al, 2009). Teachers act as organizer and facilitator who encourages communication, group discussions and various forms of collaboration in developing critical thinking skills (Popov, 2008). Fettes (2013) suggested that the practice of democratic learning can strengthen the relationship between experience and imagination. The principle of such a democratic learning: learning multisumber, flexibility to develop personal potential, implement collaborative learning etc., Encourage the development of critical thinking skills and abilities. Collaborative learning environments in small groups is the most convincing design of learning environments (Heller et al, 1992). Environment as a learning objects, allowing the development of collaborative groups of students in learning science through scientific procedures. According Kazempour (2014) about collaborative learning environment can be emphasized in scientific practice, critical thinking and problem solving. Most of the activities undertaken thematic assignment instructions with parents / community. Parents and the community can act as a facilitator or student learning partners, depending mastery of the material. The role of parents and the community respond to the challenges of social dimensions of science learning, which is to make citizens responsible for the social problems related to science. Teachers act as facilitators who intensively interact with students. According Moswela (2010), teacher collaborative interactions with students can improve intellectual activity and can accommodate learning activities.

Reflection thematic task is developed through the process of assessment tasks within their own group (intragroup assessment) and assessment across groups (intergroup assessment). Reflection thematic task is the process of integrating the experience with critical thinking imaginatively. Nichols et al. (1997) in Akerson et al. (2000), suggests that the practice reflective science learning allows teachers to develop learning resources so that students can think critically about science learning materials connected with his own experiences. Instructions thematic task to integrate the student experience of the facts and phenomena in the surrounding environment with related concepts in the lesson. Thematic material categories reflection task in our research include: a description of the facts / issues of local, description-concept relationship context, description of the process of science, the description of networking concepts, social implications description. Evaluation of product development tasks thematic reflection, may indicate an increase in the skills of reflection, as well as showing the weaknesses and strengths of students in reflecting material categories thematic assignment instructions.

Research assignment instructions thematic reflection process is a special part of thematic research and development tasks in school. The general objective of the research is the creation of a democratic science lessons at school are supported by the Universitas Negeri Manado. The general objective is spelled out in a five-year objectives, namely:

(1) Develop and strengthen the thematic task model for learning in school that synergy with the development competence of prospective teachers in Unima.
(2) Improving the ability of creative and innovative thinking of the faculty, students and teachers interactively through the design and implementation of holistic thematic task to improved cognitive ability, psychomotor and affective.
(3) Build participation of parents and communities in the development of learning materials and activities, so as to gradually build a participatory-democratic learning climate.

The purpose of research first year (2014) are: (1) designing learning materials sourced from the issues in the environment of students, with the participation of parents and the community, (2) implement instructional design with the participation of parents and the community, and (3) designing and implement evaluation dialogical among school-student-parent. This article describes thematic reflection process tasks as part of the democratization process of learning and improvement of critical thinking skills and imaginative students. In particular, this study describes the impact of peer assessment process (intragroup and intergroup) followed by reflection, the material classification task: the description of the facts and phenomena, linking concepts with the context, process sciences, formulation of networking concepts, and social implications of the water cycle thematic task.

Research Methods

Research thematic reflection task is a specific part of the scheme more extensive research on the development of thematic tasks at school (in the North Sulawesi), with the support of Universitas Negeri Manado. The first year (2014) was conducted in three districts in Sangihe, namely District Manganitu, District and Sub-District Tamako Central Tabulan. Implementation of instruction thematic task carried out for two months (January - February 2014). Instructional material includes five themes: water cycle, land landslide, energy, coastal erosion, and mangrove forests. This thematic task instructional materials integrate the concept of science - mathematics with related social problems such as the behavior of the public, local wisdom, the community response to the government program on the management of natural resources and the environment into learning objects. Thematic instruction have proven reliable as instructional methods to integrate the various concepts in the curriculum with life and everyday experience (Medellu, 2014). Thematic instruction can be developed to build cognitive skills such as reading, think, remember and write context in real life and encourage creative exploration (Fogarty, 1997). According to Barton and Smith (2000), Integrated instruction also allows implemented authentic assessment. Implementation of thematic task carried out in small groups, to encourage students to acquire basic cooperative attitude, and values needed to think independently inside and outside the classroom (Borich, 2004). Ajaja and Eravwoke (2010) affirmed that cooperative learning as an instructional strategy to significantly improve science learning outcomes

The process of reflection is a specific part of the implementation of thematic assignment instructions. Reflection process carried out by the students in the group after they do peer assessment on their own tasks (intragroup assessment), or after their service direviu by other groups (intergroup assessment). Schematically, the mechanism of peer assessment and reflection are presented in Figure-1

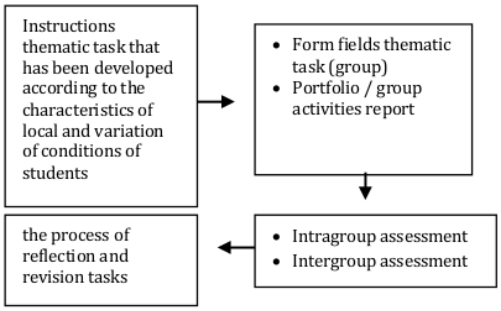

Figure 1 Review Mechanism, a Process of Reflection and Revision of Thematic Task

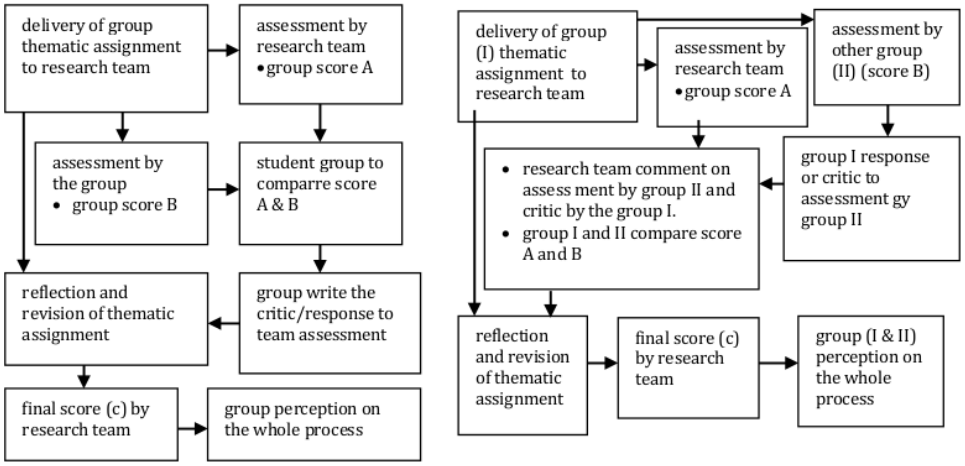

Figure 2 Mechanism of Intragroup Assessment and Reflection

Peer assessment was done for inputs (the identification) components of the tasks that need to be completed or corrected. The input can come from members of their own group (intragroup) or from members of other groups (intergroup). Research peer assessment by a group of students, among others, performed by Falchikov (2003), and Kritikos et al (2011). Kritikos et al (2011) developed a peer assessment process that triangulated with input facilitators. Reflection thematic task carried out by a group of students after they assess the task alone product or after receiving the results of assessment of the other groups. Reflection conducted to assess, analyze feedback assessment and reformulate the result of integration experience, knowledge with these inputs. Ires and Cakir (2006) cites Tann (1993) suggests that critical reflection is needed to find alternative analysis and compare it with the work of others or other theory to the formulation and testing of back.

van Leeuwen et al (2009), developed a method of reflection groups of students in two phases. The first phase is the inclusion of actual experience and reflection that experience. The second phase is the abstraction of experience and testing this new experience on behavior. In this study, the first phase of reflection is a reflection of the description of the facts / phenomena of local issues (inclusion of actual experience) and reflection-concept relationship context. Reflections on the first phase of a response to the peer assessment (intragroup and extragroup). In our study, the second phase of reflection is a reflection of the process of science, formulation networking related concepts, and descriptions of social implications. In the process of assessment and reflection, the teacher acts as a facilitator, while parents become partners in specific activities students undertake reflection. Learning held in two schools. The

process of reflection at the first school (SHS Tamako) is done through the stages of assessment tasks by the group itself. The process of reflection at the second school (SHS Manganitu) is done through the stages of assessment across groups.

Data presented reflection process and product quantitatively (percentage of the task item that reflected true and complement / improve thematic task group). The process of assessment and reflection carried out by sub-themes / activities appropriate instructional design thematic duty cycle of water. Sub themes / activities, classification of matter and form of group activities of students in instructional design thematic task water cycle is presented in Table 1 (appendix). Checkmark (√) indicates classification and forms of activity are in accordance with sub-themes or sub-activities. Format (Table-1) is used to analyze the data in a form the thematic assignment instructions and the result of reflection. Description percentage form field data is thematic assignment instructions and revisions (the result of reflection) from the initial meeting to the next meeting may indicate an increase in the productivity of the process and reflection. Percentage of reflection according to material classification tasks can show the productivity of peer assessment and reflection process according to the classification of the material.

Results and Discussion

Table 2 (appendix) presents data-highest percentage of lowest field of thematic task instruction form, and the highest percentage of low-reflection results (through assessment intragroup and intergroup assessment), according to the classification of the thematic material duty cycle of water. Thematic material classification tasks include: a description of the facts and phenomena, linking concepts with the context, the process of science, social networking concept and implications of the water cycle thematic task. The interpretation of the data and descriptions are as follows:

1. The process of reflection a significant impact on the percentage of data form field thematic task, for classification of material description of the facts / phenomena, the process of science, learning and social implications of the water cycle. It can be seen from the wide range of stuffing percentage of the data group (a) or data without reflection data group (b) or the data of reflection through assessment in the group, and the data group (c) or reflection through the assessment results data across groups. Significant impact on the classification reflection not matter: the relationship with the concept of context, and the formulation of networking concepts. The results of interviews with a group of students revealed that students do not understand the concept so well that they are difficult to connect the concept of the context, and formulate networking concepts. The results of this study partly corresponds with the results of research Akerson et al (2000), but some are different. Compliance with the research results Akerson et al (2000) on the scientific knowledge about natural materials (facts / phenomena) and observation (relationship with science process). The different results with regard to the law and theory. Research Akerson et al proved that reflection influence the outcome of legal analysis and theory. In this study, the reflection does not significantly influence the formulation of concepts and networking concepts (consistent with the law and theory). Prior knowledge and experience of the facts and phenomena, knowledge of the social implications, as well as direct experience in the field activities (observation, measurement, comparative field conditions) enhance students' thinking skills. When a group of students were instructed to reflect on the task, then an increase (improvement tasks) are significant. The combination of the assessment process (in a group or across groups) to identify parts of the tasks that need to be repaired, which followed up a reflection group is a pretty good mechanism to increase the knowledge and ability of critical thinking. Results of research Schwartz et al. (2004) concluded that the experience of the process of science, slightly improve student understanding, but that experience is important in setting the context in which students can reflect on the nature and process of science. Schwartz et al study results are in line with the results of this study, particularly with regard to the classification of

materials science process. Khishfe research results and Abd-El-Khalick (2002) suggested that in the process of science, reflection needs to be integrated with the process of science, to improve students' understanding of the nature of science.

2. Impact of reflection significantly to the classification of material directly related to the experience, and no significant effect on the classification of materials that are more abstract (concepts relation to the context and the formulation of networking concepts), consistent with the results of van Leeuwen et al (2009). The results of the research van Leeuwen et al concluded that the process of inclusion of experience and reflection on that experience to grow significantly, while the process of abstraction of experience did not show significant results. Analysis of the range of the low percentage of forms available in the classification of materials science process lower, affected by a lack of mastery of science concepts. The results of interviews with students revealed that they could understand the procedure sins but can not make a deeper analysis due to poor mastery of concepts. These results concur with those of Clough (2006) who argued that students should be given the opportunity to assess the concept that has been known previously to help understand the nature and process of science. Mastery of concepts that they cause less disadvantaged students explore the process of science and networking concepts related to the phenomenon. Results of research Arrieta et al (2005) that learning science procedures or procedural capacity building, is more difficult than learning conceptual, because it takes the ability to apply cognitive, so it takes time to learn more. Evaluation of the task group concluded that the students reflect on the process of science, significant enough to make a group of students to understand the steps procedural material science but the description can not be done in depth because of the lack of mastery of concepts. Mastery of science and math concepts that low also causes a percentage stuffing thematic task that is low on material classification networking concepts. The impact of significant reflections for the material formulation concepts networks caused by lack of mastery of the concepts of science and mathematics-related elements of the context or the facts and phenomena of the water cycle. The results of this study may reflect the learning and mastery of the material weaknesses relating to governance relationship with the concept of the context in which further affects the mastery of science and formulation processes networking traffic concept study areas. Mastery networking concept mastery of subject areas into a comprehensive indicator (cognitive) of the facts and phenomena and the relationship between phenomena in the water cycle theme.
3. Impact of significant reflection of the increase in the percentage of thematic classification task stuffing material social implications. This is due to students having mastered the social problems (people's behavior), local wisdom, in response to the government's program on water management. The process of inclusion experience with knowledge of the water cycle is developed through peer assessment mechanism followed by reflection students can build a positive attitude and commitment to water management responsibilities. Ires and Cakir (2006) points out that in the final part, a reflection oriented in character education by asking the students about his ideas, beliefs and values about learning science and to bring his experience they were aided clarification, confrontation and possible changes theories that have it's.
4. In general, the results showed that the mechanism of peer assessment followed by reflection gives positive effect on the construction of knowledge, skills (the science) and affective (social implications) if the student has the experience and knowledge of early adequate. According Kritikos et al (2011) the process of peer assessment to make students interested, confident and motivated to develop goals and long-term learning skills. Make the student experience productive groups in identifying and assessing the form fields its own task or tasks other groups. Adequate experience also determines the ability of groups of students perform tasks deepening and revision materials at the stage of reflection. The results of this study confirms the importance of the continuity of learning materials and activities. Materials and learning activities designed for

students to be adjust with mastering "real" learning material beforehand. Mastery of basic material needs to be evaluated first and if necessary the deepening so that students can implement instructional activities. The weakness of the students in formulating the concept of networking a challenge for interdisciplinary thematic learning. Student motivation and group interaction in the discussions and observations, assessment and reflection process tasks, indicating that the application of thematic assignment instructions water cycle (and other thematic task) the potential to improve the knowledge, skills and affection of students on water management. Student interaction in the group also shows the development of a democratic attitude of learning. Results of the research team observed the student activity ranging from the implementation of activities until the task reflection shows the development of democratic learning climate. Students are more active in communication (asking, answering, explaining to friends, accepting criticism), split duties in the activities of observation, assisting members of the group who experience barriers to learning, motivate friends perform assessment and reflection etc. According Kazempour (2014), a collaboration of students in science learning encourages them put forward questions, explore ideas and take steps so that at the end of science learning activities students can improve their critical thinking skills and independent learning skills. Private student motivation and groups need to be maintained in the process of knowledge construction. Grandmontagne and Villamor (2005), suggested that the motivation and the acquisition of knowledge related to one another. Continuity of material and activities in science learning (thematic) becomes a prerequisite in constructivist learning strategies (Ugarte, 2005)

Conclusion

The assessment and reflection thematic duty cycle positive effect on the water quality improvement task assignment if material associated with the experience and knowledge of the initial or base owned by the students. The results reflect significant effect on improvement / repair tasks associated with the material description of the facts and phenomena, the process of science, and social implications of the water cycle thematic task. Reflection no significant effect on increasing mastery of concepts relationship with the context and the formulation of networking concepts. This is caused by a lack of mastery of concepts related to the facts and phenomena of the water cycle. The results of this study indicate the challenges in the thematic learning relationship mastery of concepts in the context of networking concepts and formulation of interdisciplinary studies (interdisciplinary). The results also recommended the importance of continuity of materials and learning activities to enable students construct knowledge based on their experiences, while developing critical thinking skills. Implementation of the draft thematic task by a small group of students ranging from the implementation of the thematic assignment instructions to the reflection tasks, can create a climate of democratic learning.

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