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by Jeffry S. J. Lengkong

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Jeane V Tumangkeng[1], Deitje A Katuuk[2], SJ Pasandaran[3], Jeffry SJ Lengkong[4]
[1] Physics Department, Faculty of Mathematics and Natural Sciences, Manado State University, Indonesia
[2,3,4] Manado State University, Indonesia

Abstract
The purpose of this research is to design theory and learning, apply design and evaluate the ability of groups of students to explore context, local wisdom concepts and scientific processes about energy in everyday life and in the process of production machetes. The method used in this research is mixed methods. Data collection was carried out using observation, in-depth interviews, and measurements. The data analysis used a combination of quantitative and qualitative analysis. The results of material design and learning that are obtained are designs for learning activities which include learning activities stage-1 (exploration of the energy context in general), learning activities stage-2 (exploration of scientific concepts and processes about energy in the surrounding environment, its use by the community and the impact), stage-3 learning activities (exploration of context, concepts and scientific processes of machetes production). Overall, the implementation of learning activities in stages 1, 2 and 3 is very enjoyable for students, increasing critical thinking skills and the potential to be followed up and developed with coordination and facilitation by teachers, school leaders, parents and the community.

Keywords: learning management, explorative learning, democratic interaction, local wisdom

Introduction

Learning issues are relevant to the experiences and needs of children and the use of the surrounding environment as learning objects is a challenge for schools and teachers. Community participation is seen as important in education development and planning, because community involvement directly reflects the needs of the community [1]. Parents and the community can act as resource persons, facilitators or children's learning partners [2]. The results of the pre-research interview in Sangihe District revealed that community members expect learning activities that can build the active role of students and the younger generation as developed through these field activities.

Exploration of the concepts and scientific processes of energy use and its impact has not been developed as an object and learning activity. The results of the thematic-explorative-democratic learning collaboration research conducted by the faculty team of FMIPA Unima [2] concluded that the process of identifying concepts and scientific processes about the context in the surrounding environment is still difficult for students to do because learning is transforming knowledge or information. from teachers to students. Students are passive and just accept the information conveyed by the teacher. The learning material provided by the teacher only comes from textbooks. Exploration and analysis of science concepts about natural resources around us and cultural values that exist in society is a potential learning object to build knowledge, skills, and positive attitudes of students towards the use of natural resources and respect the culture and local wisdom of the community.

Machetes production exploration is an activity to identify the context (principles and processes of production machetes) followed by exploration of scientific concepts and processes. The exploration of machete production is a follow-up to the exploration of the energy context and the exploration of general concepts and processes of energy utilization in everyday life. In the exploration of machete production, students carry out group activities independently with the main facilitator being a blacksmith who also acts as a resource.

Exploration of learning materials that integrate various natural phenomena, knowledge and skills and values in society, is a process to integrate experiences gained from everyday life with regular learning in schools. This is an innovation in the development of learning based on the context of everyday life. The design of group exploratory learning activities is a mechanism for the ongoing communication of group members who each have different perceptions and experiences about the object of learning. Democratic interaction will ensure open communication, the productivity of group activities and the quality of the results of analysis and reports on group learning activities. Democratic interaction through study groups serves to increase the productivity and quality of group learning products, as well as build individual democratic attitudes in working and interacting with friends, as social capital.

Based on these problems, it is necessary to have a management model that must be developed in the context of democratization. Koontz and Weihrich (in Fuad) [3] define management as the process of designing and managing an environment where people work together with groups efficiently to achieve goals. Furthermore, to achieve learning objectives, a learning model is needed. The learning management model is a number of strategic components that are arranged in an integrative manner that includes steps, application of the results of thoughts, examples and various strategies undertaken to motivate

students. In this study, the learning model used is a model by integrating the local wisdom of the community in science learning. Learning that is carried out by the teacher is strived to be able to take advantage of the values of local wisdom and explore the natural resources that are around us as a source of learning for students.

This research aims to build a participative community, namely a society community that participate in the learning design. This community can be a source of information about local culture and wisdom, use of natural resources, management of resources and their impacts, etc. This study aims to produce a learning management model, namely explorative-democratic learning planning, implementation and evaluation. The learning objects includes exploration of learning objects, namely the energy in the surrounding environment, exploration of scientific concepts and processes of energy use and its impact, and exploration of machete production.

Theorytical Framework

Explorative learning is a learning strategy that is mostly carried out by students by means of finding through observation, discovery, search, and investigation activities. Democratic education is learning to students about the environment in which they and teachers are together to carry out learning activities. Democratic education in schools is implemented based on the principle that teachers and students will carry out learning activities together, share in decision making based on the principle of the majority.

Local wisdom is the cultural identity or personality of a nation that causes the nation to be able to absorb, even process culture from outside other nations into its own character and abilitie [4]. Local wisdom also has a function in learning activities. Local wisdom-based learning activities can be developed by utilizing the potential of the community's environment and culture as a learning resource [5]. Management is a process or framework, which involves the guidance or direction of a group of people toward organizational goals or real goals [6]. Learning is an accumulation of the concept of teaching and the concept of learning. According to Knirk and Gustafon (in Sagala) [7] learning is a systematic process through the design, implementation and evaluation stages. Learning management is a process to achieve educational goals which include planning, organizing, directing, controlling, and evaluation.

Method

The research method used in this research is a mixed method. Mixed methods research design is a procedure for collecting, analizing, and 'mixing' both quantitative and qualitative research and methods in a single study to understand a research problem [8]. This combination or mixture method is complementary and useful for gaining a better understanding compared to one method [9]. The research design used is a concurrent model.

Sources of data were obtained from informants in this case students, resource persons (craftsmen), teachers, parents / community, school leaders. The data collection method was carried out according to the characteristics of each stage of the research. The research method includes: observation and measurement (identification and formulation of theory), formatting (observations related to theory identification, categories and role implementation), interviews (implementation and impression of the role implementation).

Results

In this study, two learning theories were developed, namely learning about energy in general which was identified in the surrounding environment and the processes, principles and concepts of physics machetes production. The basic activity theories for exploring the context and concepts of energy in general were prepared by the research team and adapted to the conditions of the school environment with teachers and students. The learning activity material explores the learning process and principles designed in the research location with the resource person (blacksmith) and the teacher, involving students. The strategy of involving students in material design and learning activities is to provide an initial introduction to the material and forms of learning activities that will be carried out in groups.

Learning Activity Design Planning

The scope of learning planning in this study includes: (1) stage-1 learning activities: exploration of the energy context in general, (2) learning activities stage-2: exploration of scientific concepts and processes about energy in the surrounding environment, its use by the community, the impact of energy utilization and its control, (3) learning activity stage-3: exploration of the context, concepts and scientific processes of machetes production.

Learning Activity Stage 1

Learning planning in stage 1 aims to obtain data and data analysis that describes the basic knowledge or initial knowledge of students about the form of energy, energy use, positive and negative impacts, and forms of impact control.

- Form of Activity 1: Identification of the form of energy and its sources, as well as direct and indirect use of it in the village.

Table 1

Energy sources	Form of energy	Utilization of energy	
		Direct	Indirect
Sun	Heat	Drying clothes, drying fish,...	The photosynthetic process of food,...
Sea water	Wave		
	Flow		
River water			
Wind			
Wood	Heat (fuel)		
Etc			

- Form of activity 2: Identify the positive and negative impacts of the energy utilization that you identified in the form-1 activity

Table 2

Form of energy	Direct positive impact	Negative impact	
		Direct	Indirect
Solar thermal			
Sea wave			
Sea flow			
..dst			

- Form of Activity 3: Controlling the impact of energy use in the village itself

Table 3

The form of energy utilization	Benefits	Energy utilization impact control
Utilization of the potential energy of water for electricity generation		
Utilization of electrical energy at home		
Utilization of fuel from wood		
Utilization of fuel oil		

- Form of Activity 4: Utilization of waste as an energy source

Table 4

Source of waste	Utilization that has been done	Potential utilization as an energy source	Potential for non-energy utilization

Data obtained through group work assessments for each form of activity-1 to 4, with reference to the following activity targets:

a. The completeness and scope of the results of the identification of the forms of energy in the surrounding environment (activity-1), the rating scale is 0-10
b. Completeness, scope and accuracy of identifying forms of energy use, positive and negative impacts (activity-2), rating scale 0-10
c. Completeness and accuracy in formulating the form of energy control or waste energy utilization used in the village itself (activity-3), rating scale 0 – 10
d. The completeness and accuracy of the description of waste utilization in general is carried out by the community in the village and the potential use according to student groups (activity-4), rating scale 0-10

Evaluation of the development of the ability to identify, analyze and describe the energy context in the surrounding environment, based on the average score of the entire group at each meeting or each activity. The data analysis format is presented in Table 1.

Table 1: Format of data analysis on the performance of field activities: identification, analysis and description of the energy context in the environment

Indicator	Activity	Group Score					Mean	Variance
		Group-1	Group -2	Group -3	Group -4	Group -5		
1	1							
	2							
	3							
	4							
	5							
2	1							
	2							
	Etc.							

Learning Activity Step 2

In this activity, data collection and analysis aims to evaluate the development of the ability of groups of students to explore scientific concepts and processes from an energy context. This exploration activity uses a design format as shown in Table 2.

Table 2: Format of activities to explore scientific concepts and processes

Energy sources	Utilization form	Utilization impact		Identification, analysis and formulation of scientific concepts & processes
		Positive	Negative	
(1)	(2)	(3)	(4)	(5)

Format filled assessment indicators, including:

a. The number of energy sources and their uses are identified and formulated in the format
b. The scope and completeness of the analysis and description of utilization impacts that occur in the surrounding environment, or which have the potential to occur based on the results of group analysis
c. The scope, completeness and accuracy of identification, analysis and formulation of scientific concepts and processes according to the form of energy utilization and impact.

The score ranges for each indicator are 0 - 10. Data analysis used the design format presented in Table 3.

Table 3: Ability analysis format explores scientific concepts and processes

Group	Energy source identification score	Utilization description score	Utilization impact description score		Score formulation of science concepts & processes	Average score
			Positive	Negative		
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Average score using the formula

$$X = \frac{X(2)+2.x(3)+2.x(4)+2.x(5)+3.x(6)}{10}$$

Where x (2) the score for energy source identification, x (3) is is the score for the description of energy utilization and so on.

Learning Activity Stage 3

Planning for stage-3 learning activities includes:

a. the process of object exploration,
b. The performance in reformulating the explanation from the source (blacksmith), and
c. The ability to explore scientific concepts and processes.

Indicators of the object exploration process by group are

a. Ability to ask questions systematically according to the work procedure of the tool
b. Ability to ask questions about the production process and factors affecting the product
c. Ability to fully and systematically describe the demonstration conducted by the resource person

Table 4: Instructional theories for the thematic task of machetes production and other iron products for the analysis of exploration ability

Object	Fact, phenomena	Analysis and description of objects, facts, phenomena	Concept identification	Formulation of a comprehensive network of scientific concepts and processes
1. Air pipe and piston	1			
	2			
	3			
2. The process of burning charcoal and heating iron	1			
	2			
	3			
3. The process of forming products from iron	1			
	2			
	3			
4. Process for hardening of iron products	1			
	2			
	3			

Exploration process data were analyzed by determining the mean and variance of all groups' scores per exploration process indicator. The data from the assessment of the exploration Process are interval data with an assessment range of 0 - 10. The format used in analyzing data on exploration ability in stage-3 learning activities is presented in Table 4.

Table 5: Format of the analysis of the local wisdom exploration process: machetes production

indicator	Meetings/ object	Group scores exploring objects						Mean	Variance
		Group-1	Group -2	Group -3	Group -4	Group -5	Group -6		
1	1								
	2								
	3								
	4								
2	Etc								

Acquisition of data and data analysis of the ability to reformulate the explanation of sources, is based on the acquisition of indicator data: (a) the scope and completeness of the description of the production process, (b) the systematics Of the production process, and (c) the factors that are controlled in the production process. Data obtained through assessment of group activity reports. The scale of the assessment data for each indicator is 0 - 10. The data analysis uses the format presented in Table 5.

Table 6: Format for the analysis of the ability to reformulate the explanation of the sources

Indicator	Meetings/ object	Group scores exploring objects						Mean	Variance
		Group-1	Group -2	Group -3	Group -4	Group -5	Group -6		
1	1								
	2								
	3								
	4								
2	dst								

Obtaining data on the ability to explore concepts and processes in local wisdom science: machetes production and other products is based on an assessment of group activity reports, with indicators: (a) completeness or coverage of the results of concept identification and description of scientific processes, (b) ability to describe the relationship between concepts and phenomena in the stages of machetes production, and.

(c) the ability to describe the scientific process of the stages and processes of machetes production. The data for each indicator is interval data with an assessment score range of 0 - 10.

The format of data analysis on the ability to explore scientific concepts and processes is presented in Table 6.

Tabel 7: Format analisis kemampuan mengeksplorasi konsep dan proses sains kearifan local: pembuatan parang dan produk lainnya.

Indicator	Meetings/ object	Skor kel. merumuskan kearifan lokal						Mean	Variance
		Group-1	Group -2	Group -3	Group -4	Group -5	Group -6		
1	1								
	2								
	3								
	4								
2	Etc								

Implementation and Evaluation of Learning Activities Development of Student Group Ability to Identify and Analyze Context (Stage-1 Learning Activities)

Analysis of the development of the group's ability to explore objects (identification and analysis of the energy context) using quantitative and qualitative approaches. Using the analysis format, the resulting data and the results of the data analysis on object exploration capabilities are generated. Figure-1 presents the average development of the group's ability (the whole group) of students to explore objects in five meetings or five instructional activities

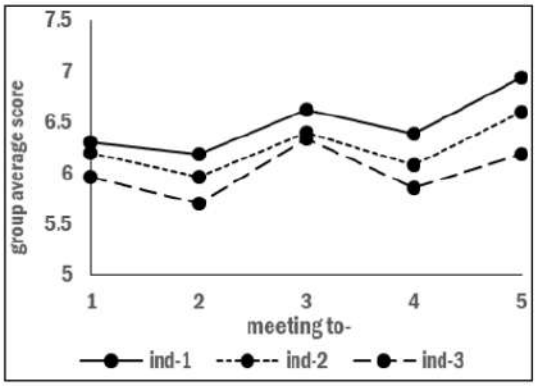

Fig 1: The development of the students' group ability to explore the energy context

The graph presented in Figure-1 shows the development of the students' group scores fluctuating from the first to the fifth meeting. The mean score of the group of students is low at the second and fourth meetings, and applies to indicators 1, 2, and 3.The results of quantitative information search, reveal that the student group has no experience and does not understand the forms of energy use in daily life and sequences waste due to energy utilization. When compared to the graph of the three indicators, the indicator with the highest group average score at each exploration activity is the first indicator, followed by the second indicator and the third indicator. This relates to the level of difficulty experienced by students in identifying the components of energy use and formulating the relationship between energy use and the impact caused by energy utilization. Initial direction (facilitation) for groups of students to understand what energy means and how its symptoms are in nature, makes it easier for students to identify energy sources in the surrounding environment, including those produced by human activities. The role of facilitation by the teacher by providing an initial understanding of energy is effective enough to improve students' ability to identify energy sources (indicator-1 for activity-1).

Development of Students' Group Ability to Identify and Analyze Concept and Process of Science about Energy (General) (Stage-2 Learning Activities)

To analyze and describe the ability of groups of students to explore scientific concepts and processes from the contexts they have identified (in stage-1), groups of students from both schools carry out separate activities such as in stage-1. Based on the evaluation results of the exploration format of each group of students, the ability to explore scientific concepts and processes was analyzed from each group. Figure-2 presents a graph of the development of the ability to explore the relationship between scientific concepts and processes with the energy context in the environment. The figure presents four graphs of the development of the ability to explore according to the exploration step: (1) step-1: the number of energy sources and their uses identified and formulated in the format, (2) step-2: scope and completeness of the analysis and description of the impact of utilization that occurs in the surrounding environment. or what has the potential to occur based on the results of group analysis, and (3) step-3: scope, completeness and accuracy of identification, analysis and formulation of scientific concepts and processes according to the form of energy utilization and impact

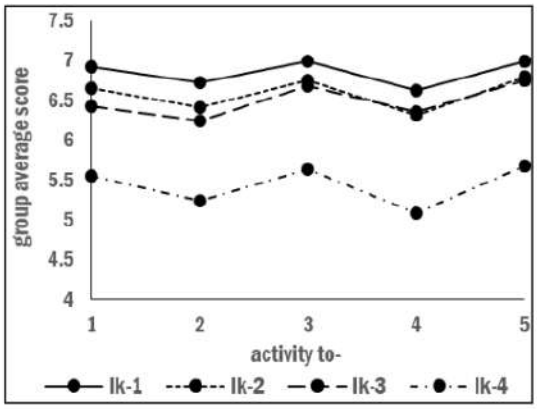

Fig 2: Ability to explore the relationship between context and scientific concepts and

Figure-2 shows the pattern of changes in the mean score for the same four exploration steps (step-1 to step-4), where in the second and fourth activities, activities 2 and 4 show the lowest average score. This relates to the complexity and difficulty of students carrying out exploratory steps for the

second and fourth material and activities. This suggests that barriers to identifying context propagate to barriers to identifying scientific concepts and processes. Figure-2. shows the highest average score for each activity occurs at the first exploration step, and the lowest at the fourth exploration step (identification - the formulation of scientific concepts and processes). This result is reasonable because the ability to explore the context-concept and process of science in the first exploration step will determine the next exploration step. The mean exploration scores in the fifth step were significantly lower than the scores for exploration steps 1, 2, and 3 indicating that identifying scientific concepts and processes poses a low mastery of scientific concepts and processes. The absence of experience in associating concepts with context (objects, phenomena, facts and figures) in the surrounding environment adds to the difficulty of students exploring in this fourth step. Teachers admit that they experience obstacles in designing activities independently and facilitate the implementation of student learning activities. Teachers need longer and more intensive training and mentoring to be able to design and implement exploratory learning based on objects and contexts in the surrounding environment.

Development of Student Group Ability to Explore Objects, Concepts and Science Processes of Machetes production (Stage-3 Learning Activities)

The analysis of the development of exploration abilities was carried out for the object of exploratory learning in traditional machete making. In this stage-3 learning activity, students from both schools are divided and distributed into five groups, with six to seven members. The analysis of the ability of independent exploration includes three exploration activities: (1) analysis of the development of the ability of groups of students to explore objects, (2) analysis of the development of the ability of groups of students to reformulate the explanation of the resource person, and (3) analysis of the development of the ability to explore concepts and processes of local wisdom science: machetes production and other products. The results of data acquisition and data analysis are as follows:

1. The results of the analysis of the development of the student's group's ability to explore the object of learning, through observation and questions to the resource person. The data were obtained through the observation format filled in by the facilitators (the research team and science and mathematics teachers from both schools). Assessment indicators include: (1) the ability to ask questions systematically according to the work procedure of the tool, (2) the ability to ask questions about the production process and factors that affect the product, (3) the ability to describe completely and systematically the demonstrations carried out by the speakers.

   Figure-3 presents a graph of the development of the three indicators of the ability to explore the principles and process of machetes production.

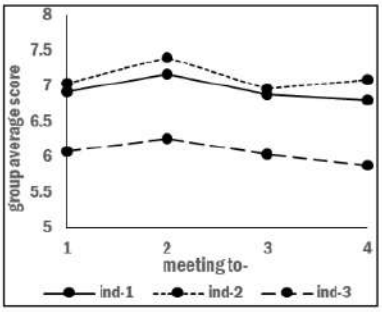

Fig 3: development of the ability to explore the principles and processes of machete production

Figure-3. Shows the ability of a group of students that is quite good in asking questions related to the working principle of the tool (indicator-1), as well as the production process and the factors that affect the machete production process (indicator-2). The group of students experienced obstacles in describing completely and systematically the demonstration of machetes production by the resource person (indicator-3). For the three indicators, the average score for the first, third and fourth meeting activities was lower than the average score for the second meeting. The results of deepening through interviews with student groups concluded that the facts and phenomena observed in activities 1, 3, and 4 were relatively more difficult to identify by students compared to activities-2. The students stated that the processes of burning charcoal and heating iron could be seen immediately and they had similar experiences in their daily lives. The difficulty in identifying objects and phenomena causes them to be less productive in asking questions and exploring the explanations given by the sources. However, students have motivation and suggest that learning that provides flexibility for students to dig information from various sources independently to be continued.

2. Evaluation of the development of the student group's ability to reformulate the explanation of the speakers, based on indicator data: (1) the scope and completeness of the description of the production process, (2) the systematic production process, and (3) the factors that are controlled in the production process. Data obtained through assessment of group activity reports.

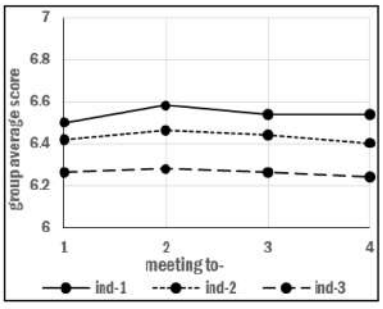

Fig 4: The ability of student groups to formulate information and observations of demonstrations by sources

Figure-4 shows a graph of the development of the group's ability to reformulate the results of interviews and observations on demonstrations of the machete production process carried out by the resource person (blacksmith). The charts of the three indicators show the same pattern of change. The mean score at the second meeting increased from the average score at the first meeting, and then decreased at the third and fourth meetings. If we compare the average score between the three graphs presented in Figure-4, it can be concluded that indicator-1 (scope and completeness of the description of the production process) reaches the highest score while indicator-3 (factors controlled in the production process) shows the lowest average score. for every meeting. This shows that the ability of the group of students to reformulate the results of the interviews and the results of their observations on the demonstration of the machete-making process is almost the same. This shows that students of SMPN-1 Manganitu and students of SMP Kr Bellae have the same experience and ability to reformulate experiences obtained from observations. The range of outcomes of reformulating the results of observations on demonstrations by the resource person (6.4 - 6.54) shows that in general groups of students can develop independent learning activities in exploring objects and reformulating. As the first experience in carrying out learning activities like this, the researcher concludes that the process of exploring concepts and scientific processes about local wisdom in the community can be developed as a special form of explorative learning.

Discussion

This study aims to produce theory and learning designs, apply designs and evaluate the ability of student groups to explore context, local wisdom concepts and scientific processes about energy in everyday life and in the process of machetes production. Research learning models are developed in an explorative-democratic learning format, through focus as a unit, namely: (1) exploration of learning theories, (2) exploration of student learning methods.

Exploration of learning materials is the exploration of objects in the form of natural phenomena and local wisdom of the society, followed by exploration of scientific concepts and processes, so that they become a unit of learning with observation and measurement-based learning activities. Exploration of student learning is a student conditioning to think critically about experiences gained from everyday life, deepening in the form of observations or measurements, analyzing and then identifying concepts and formulating scientific processes about these objects. The other side of the exploration of learning methods developed through this research is to build democratic interactions within groups and between study groups.

Planning or design of explorative-democratic learning activities includes three stages, namely: (1) stage-1 learning activities: exploration of the energy context in general, (2) learning activities stage-2: exploration of scientific concepts and processes about energy in the surrounding environment. its utilization by the community, the impact of energy use and the form of its control, and (3) exploration of the context, concepts and scientific processes of machetes production as a form of society local wisdom. The design of learning activities for stages 1 and 2 is an introduction and training stage for groups of students in exploring the context, concepts and processes of science. The design of learning theory in stages 1 and 2 is a process of integration of the context with the concept of energy carried out by groups of students. The design of the stage-3 learning activity is a follow-up to object exploration activities, namely the process and principles of machetes production, identifying concepts and scientific processes, which are carried out by students in groups.

The results of the study for stage-1 learning activities showed that based on the results of the group assignment evaluation, the group's ability in the three indicators fluctuated from the initial meeting to the last meeting. The results of deepening through interviews with groups of students and teachers revealed that this fluctuation was caused by the difficulty level of the assignment theory.

The results of the implementation of stage-2 learning activities: exploration of scientific concepts and processes about energy in the surrounding environment, show a fluctuating pattern of development in group assignment scores such as the development pattern of the ability to explore the energy context (learning activity stage-1). The fluctuation of the four graphs was caused by the difficulty level of the assignment theory in the activity design. The graph of the development of the group's abilities in each exploration step shows that the fourth exploration activity step: formulating a network of scientific concepts and processes is the most difficult step for students to do. The results of interviews with students revealed that these difficulties were caused by inexperience and lack of mastery of concepts, causing difficulties ranging from identifying concepts to formulating networks of concepts and scientific processes.

Evaluation of the implementation of stage-3 learning activities: exploration of the context, concepts and scientific processes of machetes production, is based on three analyzes and evaluation of learning activities, namely: (1) analysis of the development of student groups' ability to explore objects, (2) analysis of the development of student group abilities to reformulate explanations resource persons, and (3) development analysis of the ability to explore the concepts and processes of local wisdom science: machetes and other products. In this stage-3 learning activity it is assumed that the group of students has gained experience through learning activities stage-1 and 2, so that this activity is more independent in the form of learning interaction between students and the speaker, namely the blacksmith.

The results of the analysis of the development of the student's group's ability to explore objects through observations and questions posed to informants showed a pattern of graphic changes that decreased from the second to the fourth meeting. The results of interviews with student groups revealed that the decreasing pattern of graphic changes at the third and fourth meetings was caused by the difficulty of students in analyzing what was observed and what the informants explained about the process of forming products from iron that had been heated to red, and the process of hardening the product (machetes etc.) by dipping the product which has been heated (not until it turns red or colored) and then put it in the oil liquid. For the first and second activities, groups of students associated the process with the working principle of pumps (gas lamps, etc.) and the use of bamboo to blow firewood while cooking. The process of associating the experiences that students have is very important in exploring learning objects in the surrounding environment.

The results of the evaluation of the ability to reformulate the principles and process of machetes production demonstrated by the blacksmith showed a pattern of graphic changes similar to the process of object exploration. Changes in the indicator graph of the ability to reformulate the results of observations on demonstrations by the blacksmith have a direct bearing on the ability to explore objects by asking questions to the blacksmith. The ability to formulate what is demonstrated by blacksmiths depends on the level of difficulty of the material being demonstrated to be analyzed, interpreted and formulated or narrated by groups of students.

Overall, the implementation of learning activities for stages 1, 2 and 3 is very enjoyable for students and has the potential to be followed up and developed with the support of parents and the society. Identification of related experiences or relevant experiences that students have had becomes important information in designing activities and mechanisms for exploring learning objects as well as exploring students' learning methods. Learning management support, both the role of the implementing component and the learning facilities, greatly determines the process, achievement and productivity of exploration activities by student groups.

The integration of local wisdom in learning can increase the love of local wisdom in the environment as well as an effort to maintain the existence of local wisdom amid the swift currents of globalization [10]. Morales [11] also argues that the integration of culture and public knowledge in science learning is considered by many experts to be able to build a complete personality, concerning knowledge, skills and affection. Local wisdom values will help students in their understanding of every concept and process in the material so that The knowledge received by students is not only limited to knowledge, but can also be implemented outside of school [12].

Conclusion

The design of theory and learning can be designed from exploration which includes three stages of learning activities, namely: (a) exploration of the energy context in general, (b) exploration of scientific concepts and processes about energy in the surrounding environment, its utilization in the society, the impact of energy use and forms, (c) exploration of the context, concepts and scientific processes of machetes production as a form of local wisdom. The implementation of learning activities for stages -1 and 2 is carried out in the respective school areas, while the learning activities for stage-3 are carried out in Gunung village where there are producers of machetes and other iron products. Overall, the implementation of learning activities stage -1, 2 and 3 is very enjoyable for students, increasing critical thinking skills and the potential to be followed up and developed with coordination and facilitation by teachers, school leaders, parents and the society.

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