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Thematic – Eksplorative – Democratic learning (TED-L) in exploring Energy utilization on the Para Island and its learning

Yeremia A Talumepa[1], Jeanne C Rende[2], Farly R Tumimomor[2]
[1] Department of Physics, Faculty of Mathematics, Natural and Earth Science, Manado State University, Indonesia
[2] Lecturer, Department of Physics, Faculty of Mathematics, Natural and Earth Science, Manado State University, Indonesia

Abstract
Thematic – Exploratory – Democratic (TED) is learning that is based on a theme where students initially explore and then discuss and exchange ideas so that they can conclude the objectives of the learning. The purpose of this research is to find out TED-Learning in exploring and describing energy utilization. The research was conducted using descriptive methods. The research was carried out at SMP N 2 Tatoareng, Para Lele Village, Tatoareng District, Sangihe Islands Regency. Data collection techniques through documentation studies, interviews and using exploration sheets regarding energy utilization. Through the results of this research, it was identified that solar energy is most widely used by society in the form of using solar cells for lighting, drying agricultural products and fisheries. Then successively for the use of chemical energy and wind energy. Then the students' ability to explore energy use averaged a score of > 70. This shows that the students understand enough about energy use in the village where the students live.

Keywords: Learning, thematic, exploratory, democratic

Introduction

Science is knowledge learning knowledge _ about various type symptom natural in a way systematic through observation and experimentation. According to 'The Columbia Encyclopaedin' (1963), “Science is accumulated and systematic learning, usually _ focused on phenomena nature. Progress knowledge knowledge No only marked by accumulation _ fact, but with appearance method science and attitude scientific".

Physics is fundamental science that becomes bone back for development knowledge knowledge and technology (Supiyanto, 2007) [12]. Learning physics will more optimal if supported with source originating learning_from environment natural around (Rende and Tulandi, 2022) [8]. Learning physics done through observation, analysis, as well measurement For We Can interesting something conclusion. Physics become lessons learned _ develop ability participant educate in think for solve something problems found _ daily.

So far learning physics only focuses on formulas that are difficult to understand, and questions in the book teachings. Book - focused learning _ simply, eliminate or reduce chance understand facts / phenomena / issues that exist in the environment around (Medellu, 2019) [5]. This matter is reason Lots participant insufficient education _ interested For Study physics. Therefore _ That very cool important for teachers to teach physics past natural around order participants educate Can more understand that phenomenon frequent nature _ happening around _ is learning physics, and can interesting interest participant educate For Study physics.

One of material important in learning physics is energy. Energy in nature known in various form. Utilization energy is matter important as source Power in support life. Modern society competes exploit sources energy, because need its use. For society traditional on the island _ small also known variously form utilization energy. Utilization energy in a way traditional limited Good in variation its use nor intensity or quantity energy. Utilization existing energy _ in objects particular in nature often bring up problem like waste and various disaster.

Thematic – Exploratory – Democratic (TED) is learning that is based on something the original theme participant educate do exploration furthermore do discussion Where participant educate Can each other exchange thought so that Can conclude objective from learning the. In TED learning the teacher acts as facilitator for support and develop understanding participant educate, so participant educate Can more free in be creative and can build his knowledge Alone in respective fields.

Learning explorative about utilization energy on the island small own mark important related with need and availability energy. Utilization friendly energy _ environment Not yet lots developed by the community, specifically people on the island _ small. Whereas impact from utilization energy the very big for society and ecosystem island small.

Based on description above, I _ encouraged for do research so you can connect inside learning _ class and experience everyday in it there is draft physics about energy, so existing energy _ Can utilized with OK, because That I lift thematic – exploratory – democratic learning (TED-L) title in explore utilization the energy on the island of para, and its learning.

Literature Research

Learning in Nature

Natural is source learn what you can We meet every day. Nature says in Dictionary Big Indonesian (KBBI) means everything something that exists in the heavens and the earth. Wulansari and Sugito (2016) [14] wrote that “environment around can made as alternative for activity

Study teach. In accordance material lesson physics is natural as well as its contents, namely phenomenon encompassing nature _ causes, processes, and impacts / applications, then source Study physics is environment nature around _ participant education (Dwisiwi and Wiyatmo, 2015) [2]. Natural provide Lots material that can learned by participants educate and almost all over participant educate own experience in nature. Natural provide Lots energy and sources power that can utilized. Energy and sources power provided _ natural we can too use as something learning.

Learning Explorative

" Learning Explorative is method learning for create ideas and knowledge new customized _ with change environment through activity ongoing experimentation" (JC Rende *et al*. 2020) [9]. In the learning process that begins with activity understand problems, collecting and analyzing data, building conjecture, connecting something draft with draft else, then make logical conclusion _ based on facts that are known and have been found "This model emphasize on importance obtain information, knowledge and values in society" (Tambaani, Medellu, and Silangen. 2020) [6]. Learning explorative is one possible strategy _ used for improve the learning process physics. "Model learning explorative This used for object learning that emphasizes facts and phenomena _ natural around" (Ngoryanto, Medellu, and Silangen. 2020) [13]

Some Steps to carry out learning explorative according to (Medellu, 2019) [5], namely : (1) Identify object from facts and phenomena that become base learning, (2) Analyzing linkages between factor from every facts and provide description phenomenon in accordance order so that produce clear picture _ about phenomenon or existing facts, (3) Exploring scientific concepts and processes from already a phenomenon identified and described, connecting variables and searching reference so that get strengthening from results analysis phenomena, (4) Analyzing, synthesizing and formulating connection results analysis context related phenomenon with scientific concepts and processes.

Utilization Energy on the island small

in Island small Lots very available energy _ for example, namely: energy sun, energy, wind, energy chemistry. In Island Small is also really needed energy electricity.

Study Related

1. Research conducted by Keke Tamangendor, and Djeli Tulandi with title: Design and implementation task thematic aspect physics energy with approach school environment. _ Study development This done with objective develop design instructional task thematic base with input element local together with teachers, students, parents and the community, describe the implementation process task thematic energy.
2. Research conducted by Christophil S. Medellu and Patricia M. Lintasan (2019) [5] "Reflective Questions in Explorative Learning: HOTL-DI _A and B Model" which shows and explains about question reflection in learning explorative with using a learning modelb exploratory HOTL-DI types A and B.
3. Research conducted by Christophil S. Medellu (2019) [5] "Learning About the Environment. Model of High Order Thinking Learning in Democratic Interaction" which explains about learning think level tall in interaction democratic.

Research Methods

The research was carried out at Tatoareng Middle School, Para Lele Village, District Tatoareng, Regency Island Sangihe. In June – July 2021. Object study This is Utilization Energy on Para Island, Para Lele Village. Subject in study This is participant Tatoareng Middle School student class VII to IX. Research methods used _ in study This is study Descriptive.

Data analysis technique

Main techniques from study This processed with use equality percentage.

Results and Discussion

Learning explorative with topic utilization energy done in a way gradually. The first stage, giving reference for studied participant, reference in question form journal, book text and information other about utilization energy. Expected information _ obtained student through exploration document / reading about utilization energy in a way comprehensive especially those on the Islands of the Archipelago Sangihe. Utilization energy the one referred to on Para Island is utilization ray sun for lighting through cell solar, utilization energy hot ray sun for drying fish and ingredients agriculture, utilization energy electricity with source Generator electricity, utilization energy chemicals on stoves, utilization energy wind on the boat screen. Furthermore done stare face in class, in stare advance This student given the form to fill in related utilization energy. Fill in this format intended for participants own experience in explore concept and how compile connection draft the physics.

Requested format student fill it is sheet exploration utilization energy. With retrieve data on results exploration student about utilization energy. Place research in held at Tatoareng Middle School, Para Lele Village, District Tatoareng, Regency Island Sangihe in June – July 2021. Table. 1 below inform results activity explorative students.

Table 1: Learning outcomes exploratory

No. Subject	A	B	C	D	E	Average
	1	2	3	4	5	
1	85	85	75	80	85	82.00
2	70	70	80	70	70	72.00
3	85	85	80	85	80	83,00
4	80	85	75	85	75	80,00

5	65	70	75	70	70	70,00
6	65	65	70	65	70	67,00
7	90	90	90	90	90	90,00
8	60	60	60	70	55	61,00
9	85	85	85	85	85	85,00
10	95	90	95	90	90	92,00
11	95	90	90	95	90	92,00
12	65	70	65	65	65	66,00
13	80	75	80	85	80	80.00
14	60	60	70	60	65	63.00
15	80	85	90	85	65	81.00
Average	77.33	77.67	78.67	78.67	75.67	77.60

Information

A = Energy Ray Sun Utilization of Solar Cells
B = Energy Ray Sun For drying fish, coconut, etc.
C = Energy Wind For boat screen
D = Electrical Energy with source generator current
E = Chemical Energy for stove

The data in table 1 shows that there were 9 students who got it score above 75 or _ in other words, there are 9 students who understand draft energy utilized _ people on Para Island. Then there are 60.9% ≤ 6 students understand draft utilization energy ≤ 74.9%.

Conclusion

Based on results research and discussion obtained _ from research data can withdrawn conclusion that ability student in explore utilization energy on Para Lele island get mark with an average of >70, so Can concluded that student Enough understand about utilization energy in the village place stay student.

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