The analysis of student prior knowledge to flood disaster

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The analysis of student prior knowledge to flood disaster

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Abstract. The analysis results of risk assessment in 2016 indicate, the flood disaster in Padang City from year to year after year has increased. This study aims to describe student's prior knowledge of the flood disaster in developing teaching materials of Senior High School Physics flood theme. This research uses a descriptive qualitative method with data collection by using a questionnaire. The questionnaire instrument of prior Knowledge of flood disaster consists of 4 indicator questions developed into 14 question variables. The results of the analysis obtained the prior knowledge of students classified into the enough category with an average percentage of 35.34%. The results of the prior knowledge analysis of this flood disaster indicate that it is necessary to develop the teaching materials of Senior High School Physics.

1. Intoduction

Over the past 20 years, various disasters that have occurred in Indonesia have caused many losses. From the data of The Asia Pacific Disaster Report 2010 compiled by The Economic and Social Commission for Asia and the Pacific (ESCAP) and The UN International Strategy for Disaster Reduction (UNISDR) losses suffered by Indonesia at least US $ 22.5 billion. So Indonesia ranks second as a country that has death rates caused by floods in Asia-Pacific [1]. According to Flood Disaster Management Agency West Sumatra Province in 2016, West Sumatra Province, especially the city of Padang is a city that has a medium to high potential for flooding. There are seven sub-districts in Padang that have the potential, including Koto Tangah, Lubuk Begalung, Nanggalo, Padang Selatan, Padang Barat, Teluk Kabung and Padang Timur is covering 14 villages [2]. The cause of floods in the Padang City is, the recorded Padang City has 5 major rivers and 16 small rivers in the lowlands, has a tropical climate with rainfall almost every year with high enough bulk, drainage system is not good for ready to accommodate rain or water pairs, the lack of hygiene of the gutter and disappearance of green open spaces and water absorption as transformed into luxury housing complex and shopping centers/shops [3]. So for that, several efforts need to be done to minimize the impact that will occur.

Based on data analysis of Meteorology Climatology and Geophysics Council Padang Pariaman related to flood disaster of Padang City (2018). The impact of floods that occurred in some areas in the Padang City was caused by extreme rainfall that was far above average, causing the air mass curves caused by the meeting of Eddy current and the low-pressure center in the Indian Ocean. Increasing sea surface temperature can also increase the potential for additional rainfall. This phenomenon supports the growth

of clouds that have the potential to cause the occurrence of heavy rain with moderate intensity that impacts the occurrence of floods [4]. Research conducted in Serang Regency (2018) states that women's knowledge, attitude and preparedness in flood-prone areas need to be given so that when the flood occurs women can avoid and avoid themselves from things that can cause flooding because its nature belongs to the vulnerable group in the case of floods. Then by giving knowledge women are able to behave in the face of floods, so as to minimize losses and casualties. Involving women into flood preparedness can enable women to be involved in flood disaster mitigation, play a role in early warning, monitoring control, emergency response and post-flood recovery, so that women not only wait for men or officers to provide assistance [5]. Further research on the causes of local flooding puddles at schools in Gunung Pangilun, Padang City (2018) indicates that the flood disaster that could interfere with the teaching and learning process due to water entering the classroom and access roads that are difficult to travel during floods. Thus, forcing students did not attend the teaching and learning process. Some efforts have been done by the school such as holding mutual cooperation, raising the floor elevation of the room, and improving the drainage. However, this has not been fully able to cope with flooding as it relates to drainage that is still waiting for more attention from local and central government [6].

From several studies that have been done, until now the flood disaster is still vulnerable and prone to occur, one of them in the Padang City. So there must be some effort to reduce the impact that will occur. The effort involves all genders without exception. For example, through the provision of knowledge about flood disasters, especially in school prone to flood disasters. Students in the school must have prior knowledge of floods, so students can learn about the impact of floods, things to do before the floods, during floods, and after floods. According to the vision and mission of the Padang City "Making the City Padang City to Smart City Disaster", then the of government of Padang City set some target with outcomes the formation of intelligent urban village disaster. An urban village is called smart disaster if it fulfills one element, that is education sector. The education sector, which has a great influence in the provision of knowledge is the school. According to the Head of National Board for Disaster Management Regulation No. 4 of 2014 disaster-safe schools are students who bomb committed to a safe and healthy culture, aware of the well-established and risky risks before, during, and after the disaster, and are always ready to respond in the event of a disaster emergency [7]. So schools that are the source of knowledge for students have an important role in the delivery of information to the public.

People in all nations place children as the hope for the future. School is a learning institution where children will be introduced to cultural values, religious values, traditional-modern knowledge, without knowledge of the disaster. Provision of knowledge about the flood disaster needs to be done in schools, because schools are a means for children to get a variety of information that can be disseminated to the public. Schools are a place to gain knowledge related to flood disaster as well as efforts to minimize the negative impacts caused, schools located in disaster prone areas have high levels of vulnerability to disasters. So the prior knowledge of the flood disaster in schools is needed.

In this paper, an analysis of students' prior knowledge of floods will be analyzed. Prior knowledge is a set of information that can bridge the extent to which other understandings a learner can have. Good prior knowledge will help students in developing a further understanding of the material that have been learned [8,9]. Prior knowledge possessed by the learner can be obtained through the ability of the teacher to process the stored information [10]. From some understanding it can be concluded that the prior knowledge of students is a number of information held by students related to the material to be studied, so it can help in understanding the material further. Prior knowledge of the learner becomes an important source of information for teachers to determine the extent to which students understand the flood disaster, in order to conduct further research.

2. Research Method

This research is qualitative descriptive. Qualitative research methods are also called naturalistic methods because the research is done on natural conditions (natural settings) [11]. Began and Taylor define a qualitative methodology as a research procedure that produces descriptive data in the form of written or oral words of observable persons and behaviors [12]. Data collection method used is questionnaire method. Questionnaire used in the form of an open questionnaire, which is a questionnaire that asks the respondent to provide information in response to their understanding [13].

Survey was conducted in July 2018 at Public Senior High School 6 Padang. The population in this study is all students of class XI Public Senior High School 6 Padang consisting of 9 Classes. While the research sample taken by purposing random sampling technique, obtained class XI Natural Sciences 2 with the number of students 29 people as the sample research. The qualitative research procedure according is as follows: establishing focus of research, collecting data, processing data, analyzing data, and presenting data[14].

The first activities to do to start of qualitative research is to determine the research question. Research question in this research is referred to as the focus of research on the things to be sought from the research. The research method used in data retrieval is by using non test. In this no test technique are used question are sheets students' knowledge for the data needed to determine the level of students' knowledge. Techniques of data analysis consist of two namely. (a) Qualitative data analysis techniques. The results of questionnaires quality of instruments, knowledge floods, qualitative data. Qualitative data in the form of categorized value, namely SB (Very Good), B (Good), C (Simply), K (Less) [11]. (b) Quantitative data analysis techniques that are categories that are converted into quantitative data. Quantitative data from questionnaires are measurement instruments, is SB: 4, B: 3, C: 2, K: 1. Questionnaire prior knowledge consists of 4 indicators outlined in 14 Questions. Score analysis can be done by dividing the score obtained with the ideal score then multiplied 100%. So it can be expressed in the equation 1:

$$P = \frac{A}{B} \times 100\ \% \quad (1)$$

Information:
P = Percentage
A = scores obtained
B = ideal score
Classification categories of this analysis can be seen in Table 1.

Table 1. Criteria Assessment Prior Knowledge Students [15]

Interval Score	Criteria
(75-100) %	Very Good
(50-74,99) %	Good
(25-49,99) %	Simply
(0-24,99) %	Less

3. Results and discussion

Results of this study is data of the prior knowledge of students the flood disaster that will be implemented in the development of teaching materials of Senior High School Physics. Based on data analysis Flood Disaster Management Agency West Sumatra 2016, one of the areas in Padang City that has medium to high potential for flood disasters is the District of South Padang. Public Senior High School 6 Padang is a school located in the District of South Padang. The Location of the school on the hillside resulted in the school often flooded when it rained with high and long-lasting rainfall. From the results of interviews with

several students, floods will inundate schools and the classroom floor, especially in the eastern part of the school that do have low ground. This will certainly disrupt the learning activities in the classroom. For that, students need to have prior knowledge about the flood disaster, so students can know and do to reduce the impact of flooding, things to do when the flood occurs and the action to be done after the flood.

Based on the prior knowledge questionnaire filled with students, where the questionnaire consists of 4 indicator questions and consists of 14 question variables. These 4 indicators include (A) knowledge of flood disasters, (B) flood disaster classification, (C) flood disaster risk, and (D) flood disaster mitigation.

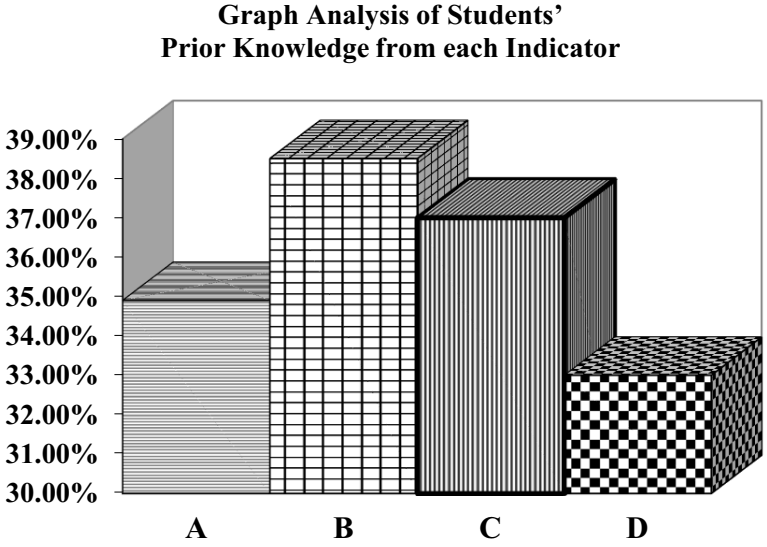

Figure 1. Graph of Results of Disaster Prior Knowledge Analysis of Each Indicator

Figure 1 is the result of student analysis about the flood disasters. Analysis of the level of students knowledge towards flood disaster is divided into 4 categories, namely Very Good (SB), Good (B), Enough (C), Less (K). Indicators (1), the students' prior knowledge about the flood disasters consisting of 4 variables questioned, with an average value of 34.91%. (2), the students' prior knowledge about classification flood disasters consisting of 3 question variables, with an average value of 38.59%. (3), students' prior knowledge about flood disaster risk consisting of 2 variables question with an average value of 37.07%. (4), the students's prior knowledge about flood disaster management which consisting of 5 variables questions with an average value of 33.10%. Based on the analysis of preliminary knowledge data, it can be seen that the percentage of early knowledge of students to flood disaster from the 4 indicators of the problem belongs to criterion C (Enough). The percentage of all indicators question is 35.34% which is also included in category C (Enough).

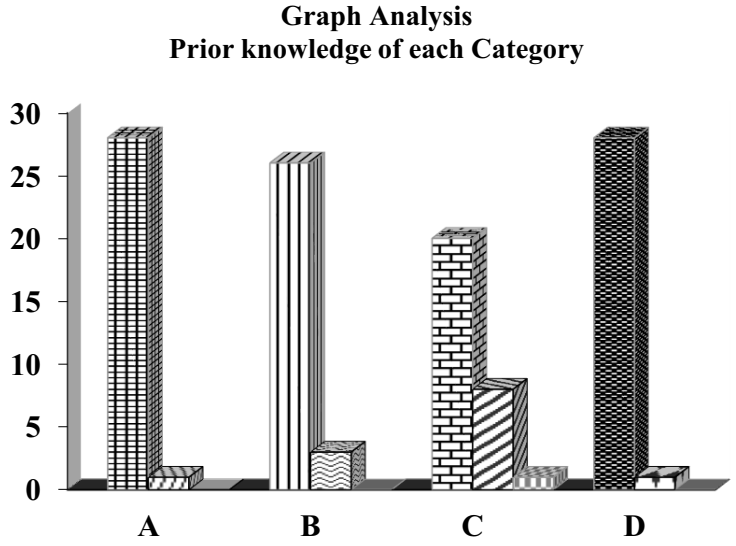

Figure 2. Graph of Results of Disaster Prior Knowledge Analysis of each Category

In Figure 2 it can be seen that out of the 4 indicators, there was only 1 student who answered very well and 8 students answered well, namely about the risk of flood disaster, there were 3 students who answered well namely the classification of floods, 1 participant students answer well bout floods, then there is one student who answers well on flood disaster management. The rest give less satisfying answers. This clarifies the lack of prior knowledge of students as regards flood disasters.

In general, of the 29 respondents studied none of the students were able to answer very good and there were only 3 students were able to answer well. Based on this data it can be seen that the prior knowledge possessed by students about flood disasters is still in category C (Enough). Of the 4 indicators of the questions' given, the students' prior knowledge on flood disaster management is the lowest indicator among the others. This indicator is one very important, because from the knowledge of flood disaster management students can find out what actions will be taken before a disaster, during a disaster, and after a flood disaster. Therefore, several efforts must be made to increase participants' students knowledge, because the knowledge they have will influence the behavior of students in anticipating and dealing with flood disasters. This knowledge will be gained through the implementation of education in schools.

In the implementation of education required adequate facilities to support learning activities, one of which is teaching materials. Teaching materials are anything that can be used as a guide or reference to facilitate students in understanding the material being studied, both written and unwritten material create an atmosphere that allows students to learn[16]. The integrated teaching materials of flood disaster will make it easier for students to understand the material about the flood. According to the function of teaching materials for students is students can learn without having any educator or other parties, students can learn anytime and anywhere, students can learn at their own pace and choice along students can direct all activities in the learning process which is the substance of competence that should be studied or mastered[17].

4. Conclusions

Based on the results of the research conducted it can be concluded that there is still a lack of knowledge of students about flood disasters. Analysis of the prior knowledge of students in Senior High School 6 Padang is included in the criteria C (Enough), with the percentage obtained from all indicators is 35.34%. This gives an description that it is necessary to develop Senior High School Physics teaching materials with the theme of flood disaster.

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