

Multimedia-based Learning Approach in Improving the Disaster Preparedness of Junior Science High School Students

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Abstract: *The purpose of this study is to determine the effect of multimedia-based learning approach in enhancing the disaster preparedness of selected Junior Science High School students. This study consists of two groups. Each group consists of 35 students. The first group was assigned as the Control group and the second group was assigned as the Experimental group. The Control group was taught using the explicit method while the Experimental group was taught using the multimedia-based approach. Pre-test was administered to the groups and the result of this test, shows that there is no significant difference between the control and experimental group ($p < 0.0057$). On the other hand, post-test revealed that there is a significant difference between the control and experimental groups ($p < 0.00$).*

Keywords: Disaster, Disaster preparedness, Multimedia-based Learning Approach, Science Students, Teacher-centered Learning Approach

1. Introduction

Disaster preparedness should be everybody's concern. Since disasters like earthquake and typhoon is a common phenomenon in the Philippines and can be severely devastating, it is essential for the students to possess knowledge and skills in order to protect themselves as well as their families in case such disaster occurs.

The Philippines is a disaster-prone country (De Dios, 2002) due to its geographical location and its physical characteristics (Fisher, 2013) as supported by Watson (2007) natural disasters are catastrophic events with atmospheric, geologic, and hydrologic origins. Nelson (2008), stated that among all disasters occurring in the Philippines, it was observed that the most common is earthquake and typhoon because the country is located in the Pacific Ring of Fire where active and inactive volcanoes are located and these volcanoes can generate shaking or tremors once there is an activity, also the Philippines is surrounded by bodies of water which is essential in the formation of tropical cyclone. Disaster is defined as a serious disruption of the functioning of a community or society causing widespread human, material, economic or environmental losses (International Strategy for Disaster Reduction cited in Mamogale, 2011, p. 7)

The Department of Education incorporates disaster preparedness in subjects like Science, disaster preparedness is any exertion and means to assure effective response to the impact of disaster, and it is the teachers' prime responsibility to instill knowledge, develop skills and preparedness among students. Topics pertaining to disaster preparedness are specifically being taught in Science 8 during the second quarter under the topics of Earthquake and Faults and Understanding Typhoon.

The result of the post-assessment among grade 8 students of Arayat National High School revealed that two sections got a

mean proficiency score of 47.80 and 48.20. The data shows that students of these two sections are non-knowledgeable about disaster preparedness, even after the teacher enthusiastically delivered the lesson still, majority of the students did not master the topic.

The researcher as a classroom teacher identified four problems encountered by the students namely; low mean proficiency score in Science during the first quarter, failing first quarterly grades in Mathematics, absenteeism among the students, and non-preparedness during disaster. The researcher decided to prioritize disaster preparedness among grade eight students because the researcher believes that student disaster preparedness is important, and it is urgent to learn and practice because disasters are cataclysmic events that can have a direct or indirect impact on the public's health and well-being.

To effectuate understanding of the problem, the researcher performed a detailed root cause analysis. The researcher was able to identify the main immediate causes; first, poor comprehension caused by inability to focus and poor vocabulary that can be attributed to poor nutrition and lack of vocabulary words. Second, non-motivated students caused by students' negative attitude towards the topic and limited participation in the class due to lack of interest and non-conducive teaching learning environment. Third, the pedagogy and approaches used by the teacher in executing the lesson. This can be attributed to the use of traditional method of teaching and lack of multi-media devices; these can be rooted from the lack of seminar and trainings of teachers and insufficient ICT room and equipment.

To generate understanding of the possible solutions to the identified problems, the researcher performed an opportunity tree analysis. The researcher was able to identify three major opportunities to address the problem. First, good comprehension and it can be accomplished by encouraging and strengthening the students' focus and help them

Volume 5 Issue 11, November 2016

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developed adequate vocabulary words and these can be achieved with proper nutrition and knowledge of vocabulary words. Second, use of appropriate pedagogy and approaches and sufficient or integration of multi-media or ICT in the lesson. These can be done by developing an understanding of what pedagogy suited for the lesson and use multimedia in the execution of the lesson. Third, motivated students, they can be motivated by helping the learners develops a positive outlook towards the subject and encourage the students to actively participate in classroom discussion. These can be chalked-up by stimulating interest among students and maintaining conducive teaching-learning environment. In order to decide which solution to use, the researcher made a decision making model wherein multi-media or ICT integration of the lesson surfaced as the most relevant, most doable, has the potential in the teaching-learning process, can be implemented and accomplished on time.

Given all these, the researcher now would like to determine if the level of disaster preparedness among grade 8 students of Arayat National High School can be improved by using multimedia based learning. According to Baan (2004) disaster preparedness is a term which is often used to show the capacity of the communities to respond to disasters.

Effective preparedness should be complementary to long term risk reduction and by presenting multi-media based teaching particularly with use of PowerPoint slides inserted with pictures, flow charts, schematics, animations, even video clips, the lecture may become vivid and attractive to students (Xingeng, 2012).

2. Methodology

This study utilized quasi-experimental to estimate the causal impact of an intervention on its target population. This study includes two (2) sections from grade eight (8). These sections acquired the lowest mean proficiency scores in the recently concluded post-assessment about the topic. The Mean proficiency of these two sections is as follows; 47.80 and 48.20. The first group was assigned as the control group consists of 21 males and 15 females wherein the teacher discussed a specific topic using the explicit approach. The second group consists of 19 males and 17 females wherein the teacher discussed the same topic using the multimedia-based learning in the delivery of the lesson. A standardized pre-test and post-test from the Department of Education and Philippine Institute of Volcanology and Seismology was administered to the control and experimental group.

3. Results

Table 1: Level of Disaster Preparedness of Grade 8 Students Before Exposure to Multimedia-based Learning Approach

Variables	Significant Difference	Conclusions
Pre-test: Control Group and Experimental Group	0.0057	There is no significant difference on Pre-test results of both controlled and experimental group

As shown in table 1, there is no significant difference on the level of disaster preparedness among Grade 8 science

students ($p < 0.0057$). This denotes that students have less knowledge prior to the discussion of the lesson.

Table 2: Level of Disaster Preparedness of Grade 8 Students after Exposure to Multimedia-based Learning Approach

Variables	Significant Difference	Conclusions
Post-test: Controlled Group and Experimental Group	0.0000	There is significant difference on Post-test results of both controlled and experimental group

Table 2 shows that there is a significant difference on the level of disaster preparedness among Grade 8 science students. The significant difference on the level of disaster preparedness among grade 8 science students ($p < 0.00$) can be attributed to the utilization of multimedia-based learning approach in the delivery of the lesson.

4. Conclusions

Multimedia-based approach can contribute to the meaningful learning and teaching of the students. Hence, it plays an important role in equipping the students of being prepared during the disaster like earthquake and typhoon. Effective preparedness should be complementary to long term risk reduction and by presenting multi-media based teaching particularly with use of PowerPoint slides inserted with pictures, flow charts, schematics, animations, even video clips, the lecture may become vivid and attractive to students.

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Author Profile



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