TOWARDS DISASTER-READY STUDENTRY: IMPROVING PERFORMANCE IN ANALYZING POTENTIAL EARTHQUAKE HAZARDS THROUGH FIT LEARNING ACTIVITY SHEET

Jovi S. Desemrada
Master Teacher II
Cagayan National High School - Senior High
jovi.desemrada@deped.gov.ph

ABSTRACT

The study focused on the enhancement of the academic performance of Science, Technology, Engineering and Mathematics learners in analyzing the effects of the different earthquake hazards using FIT (Feel the ImpacT) Learning Activity Sheet.

The research was conducted in Cagayan National High School during the school year 2020-2021 following the pretest-posttest experimental research design. The researcher taught the lesson to both control and experimental groups through virtual class. The experimental group received the intervention FIT Learning Activity Sheet. The proponent then administered a posttest made parallel with the pretest. Assessment tool was based on the Disaster Readiness and Risk Reduction Curriculum Guide following the developed table of specifications which was evaluated by the proponent's immediate supervisor.
After the given intervention, there is a significant difference in the mean posttest scores of the two groups. Additionally, data analysis shows that there is a significant increase in the mean pretest and mean posttest scores of the experimental group.

The intervention did enhance, with a very large effect, the learners' academic performance in analyzing the effects of the different earthquake hazards. The study suggests that the use of FIT Learning Activity Sheet may enhance the learning process of learners in concerned topic in DRRR.

Keywords: Earthquake hazards, FIT Learning, academic performance
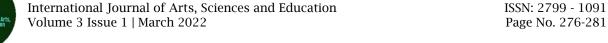
INTRODUCTION

The health pandemic caused adversely affected the education sector wherein learners' health is at risk especially when curriculum delivery would be face-to-face.

The context of today's situation, when everyone is expected to stay at home, has required schools to practice remote learning (or distance learning). The Department of Education, through DO 12, s2020 outlined the four learning delivery modalities where schools can choose from: (1) Face-to-face, (2) Distance learning, (3) Blended Learning, and (4) Homeschooling.

Of the four learning delivery modalities, Cagayan National High School has chosen Distance Learning wherein the learning takes place between the teacher and the learners who are geographically remote from each other during instruction. This modality has three types: Modular Distance Learning (MDL), Online Distance Learning (ODL), and television (TV)/Radio-Based Instruction. Modular Distance Learning involves individualized instruction that allows learners to use SLMs in print or digital format, whichever is applicable in the context of the learner, and other learning resources like learner's materials, textbooks, activity sheets, study guides, and other study materials. Critical for the successful implementation will be the production of the needed teacher's and learner's learning materials.

Aside from the pressing health concern the country is facing, natural calamities such as typhoons, flooding, and earthquakes are affecting the security of Filipinos.

Based on the report released by Volcano Discovery on December 31, 2020, during the past 30 days, Philippines was shaken by 2 quakes of magnitude 6.0 or above, 9 quakes between 5.0 and 6.0, 35 quakes between 4.0 and 5.0, 180 quakes between 3.0 and 4.0, and 746 quakes between 2.0 and 3.0. There were also 181 quakes below magnitude 2.0 which people do not normally feel.

Such hazards may cause loss of life, injury or other health impacts, property damage, loss of livelihood and services, social and economic disruption, or environmental damage.

With the increasing occurrence of natural phenomena and its risks and hazards affecting human safety, it is imperative that information dissemination on natural hazards to every individual, especially to learners, must be strengthened. To achieve a learning institution wherein learners have increased awareness and understanding of potential earthquake hazards, with the end in view of increasing people's profound understanding of disaster readiness and risk reduction, this study aims to enhance the ability of learners to "analyze the effects of the different earthquake hazards" (DRR11/12-If-g-19).

As based on the result of the pretest of G12 STEM and from the previous school year (SY 2019-2020) first grading of the first semester's item analysis, reflecting Grade 12 STEM learners' performance level on the 5 item-questions (see appendix), this research introduced the use of FIT (Feel the ImpacT) Learning Activity Sheet, a self-made learning activity sheets, towards mastery of abovementioned competency in DRRR.

METHODS

Two group pretest-posttest control group design, as an experimental research design, was employed in this action research. Both control and experimental groups were pretested for the independent variable. The intervention was then administered only to the experimental group. Both groups were then post-tested to examine the effects of manipulating the independent variable on the dependent variable.

A. *Extent of Curriculum Delivery of STEM Strand as Assessed by Teachers and Learners*

Grade 12 STEM Amethyst, the experimental group and Turquiose, the control group learners of Cagayan National High School, SY 2020-2021 were the participants of the study. The said classes are heterogeneously grouped blocks and are composed of 47 learners and 49 learners, respectively. However, only 84 learners with good internet connection participated in the conduct of pretest and posttest.

Result of the previous school year (SY 2019-2020) first grading of the first semester's item analysis, reflecting Grade 12STEM learners' performance level on the 5 item-questions (see appendix) was the basis in developing pretest and posttest.
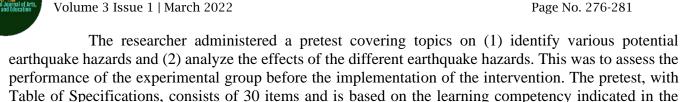
Scores of the pretest and posttest were used as data which were then statistically analyzed.

The pretest and posttest were constructed by the proponent and procedures for Validity, Quality and Reliability were taken. These were peer reviewed by the teachers who are also teaching DRRR. The assessment tool was also evaluated by the assistant principal for academics.

B. *Data Gathering Methods*

Before, during, and after the introduction of the intervention, different assessment tools were utilized to accurately measure the effectiveness of the intervention.

The researcher administered a pretest covering topics on (1) identify various potential earthquake hazards and (2) analyze the effects of the different earthquake hazards. This was to assess the performance of the experimental group before the implementation of the intervention. The pretest, with Table of Specifications, consists of 30 items and is based on the learning competency indicated in the Curriculum Guide of DRRR.

In the Experimental Stage, the researcher mentored the participants in the experimental group on how to critically analyze the different potential earthquake hazards and its effects using the FIT (Feel the ImpacT) Learning Activity Sheet. On the other hand, the control group was taught with the concerned competency in the conventional way of "new normal teaching'. This was done by conducting online lecture on the concerned competency through google meet without the use of FIT (Feel the ImpacT) Learning Activity Sheet.

After the intervention, the researcher administered to the participants a posttest that is made parallel to the pretest. The conduct of posttest assessed how far learners have gained mastery on the concerned competency. The result was used to compare the performance before and after use of FIT (Feel the ImpacT) Learning Activity Sheet.

C. Ethical Issues

All the important guiding principles under the Research Management Guidelines (DepEd Order No. 16, s. 2017) were strictly followed. The proponent observed the standard operating procedures (SOPs) in seeking the approval of the research from concerned authorities in the Department of Education.

The respondents were oriented to seek their parents' permission prior to their participation in this study. Furthermore, references and other materials used in this study were properly acknowledged.

RESULTS AND DISCUSSIONS

The mean pretest scores of the learners in the control and experimental groups in analyzing the effects of the different earthquake hazards before the use of FIT (Feel the ImpacT) Learning Activity Sheet are 19.167 and 19.474, respectively. Table 1 presents the comparison on the mean scores of learners in the control and experimental groups in the pretest.

Table 1. *Comparison on the mean scores of learners in the control and experimental groups in the pretest*

Data Set	$\bar{x}$	Std. Deviation	df	t	P(T≤t) 2-tail
Control	19.167	3.226	56	0.333	0.741*
Experimental	19.474	3.985			

*significant at 0.05 (P ≤ α, reject)

A t-ratio value of 0.333 and an associated probability of 0.741, which is greater than 0.05 is revealed in the Independent Samples t-test computation. This means that there is **no significant difference** on the mean scores of learners in the control and experimental groups in the pretest. This further suggest that the two groups have equal level of competence.

The mean posttest scores of the learners in the control and experimental groups after the use of FIT (Feel the ImpacT) Learning Activity Sheet were also determined to be 22.833 and 24.500, respectively. *Table 2* presents the comparison on the mean scores of learners in the control and experimental groups in the posttest.

Table 2. Comparison on the mean scores of learners in the control and experimental groups in the posttest

Data Set	$\bar{x}$	Std. Deviation	df	t	P(T≤t) 2-tail
Control	22.833	2.615	52	2.365	0.022*
Experimental	24.500	2.836			

*significant at 0.05 (P ≤ α, reject)

A t-ratio value of 2.365 and an associated probability of 0.022, which is less than 0.05 is revealed in the Independent Samples t-test computation. This means that there is a **significant difference** on the mean scores of learners in the control and experimental groups in the posttest. This further suggest that the experimental group that received the intervention exhibited higher level of competence.

The significant increase in the mean pretest and mean posttest scores of each of the groups was also determined. *Table 3* presents the comparison on mean pretest and mean posttest scores of each of the groups.

Table 3. Comparison on the mean pretest and mean posttest scores of each of the groups.
groups.

Statistical Parameter	Control		Experimental	
	Pretest	Posttest	Pretest	Posttest
$\bar{x}$	19.167	22.833	19.474	24.500
Std. Deviation	3.226	2.615	3.985	2.836
df	23		37	
t	-4.821		-8.915	
Sig. P(T≤t) 2-tail	9.542×10^{-11}		7.279×10^{-5}	

*significant at 0.05 (P ≤ α, reject)

For the control group, a t-ratio value of -4.821 and an associated probability of 9.542×10^{-11}, which is less than 0.05 is revealed in the Paired Samples t-test computation. On the other hand, for the experimental group, a t-ratio value of -8.915 and an associated probability of 7.279×10^{-5}, which is less than 0.05 is revealed in the Paired Samples t-test computation.

This means that there is a **significant increase** in the mean pretest and mean posttest scores of each of the groups. The finding only implies that in each group the mean scores in pretest and posttest are significantly different. This finding does not negate the fact that the experimental group still exhibited higher level of competence.

The magnitude of the difference, or the effect size, of the intervention employed was also determined with a Cohen's d value of 1.453211, as shown in *Table 4*. This indicates that the intervention employed has a very large effect.

Table 4. Effect size of the employed intervention

Data Set	$\bar{x}$	Std. Deviation	df	Cohen's d value

Pretest	19.474	3.985	37	1.453211*
Posttest	24.500	2.836		

*very large effect based on Sawilowsky's 2009 interpretation

CONCLUSIONS

The use of FIT (Feel the ImpacT) Learning Activity Sheet in analyzing the effects of the different earthquake hazards, as lessons in DRRR, did enhance the academic performance of learners.

The use of FIT (Feel the ImpacT) Learning Activity Sheet, as a mode of teaching the concerned competency, is an effective way in enhancing the academic performance of the G12 learners under the STEM Strand in Cagayan National High School - Senior High. It is therefore recommended for use in teaching the same competency.

Recommendations

Teachers should employ instruction which makes use of Learning Activity Sheet as a supplementary material to increase the level of awareness of the learners and improves their critical thinking as they identify various potential earthquake hazards and analyze the effects of the different earthquake hazards.

Conventional way of "new normal teaching" through online lecture should be coupled with the use of learning activity sheets to increase learners' competence in identifying various potential hazards and effects of earthquake. Giving optimum number of activities may boost learners' interest in studying.

REFERENCES

Abana, A (2021). A Scrutiny of K-12 Strands and the Learning Program Vis-à-vis its Academic Performance. Psychology and Education Journal. 58 (2): 7977-7984

Belango, M. & Carag, C. (2020). Enhancing Mathematical Thinking through Math Journal. International Journal of Psychosocial Rehabilitation. 24(5):5622-5629

Department of Education (2020). Adoption of the basic education learning continuity plan for school year 2020-2021in light of the covid-19 public health emergency.

DepED Order no. 31, S. 2012. Policy Guidelines on the Implementation of Grade 1to 10 of the K to 12 Basic Education Curriculum (BEC) Effective School Year 2011-2013.

Fullan, M. and S. Stiegel Bauer (2019). The New Meaning of Educational Change. London: Cassell.

Kucirkova, Natalia &Falloon, G. (2016). Apps, Technology and Younger Learners: International evidence for teaching.

Malana, M.L. (2020) Comparative Analysis in the Performance of Students in Chemistry. International Journal of Psychosocial Rehabilitation. 24 (6)

Malana, M.L. (2020). Attitude and Level of Performance of Students in Chemistry. International Journal of Psychosocial Rehabilitation. 24 (8)10148-10154

Morris, P. (2006). The School Curriculum - Development, Issues and Policies.

Romero Jr, Aldemaro. (2017). Distance education more expensive than thought. The Edwardsville Intelligencer. 3.

Volcano Discovery website. "Most Recent Earthquakes Worldwide". Retrieved December 31, 2020.