Utilization of Hands-On Minds-On Approach toward Achievement in Science

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Abstract

This study was conducted to measure the effect of Hands-On Minds-On Approach in the academic performance of students in scinece. Quasi-Experimental Method was employed using the Randomized Pretest-Posttest Control Group Design among Grade 8 pupils. The results of the pretest of both the experimental and control groups revealed that all the respondents of both groups had low academic performance on the topics of Earth and Space prior to the utilization of the developed and evaluated Module applying Hands-On Minds-On approach showed no significant difference on the level of mastery on such topics. The respondents in the experimental group were taught utilizing the said approach while the respondents in the control group were subjected to traditional lecture-discussion method of teaching. The posttest results of the respondents in the experimental group showed significantly higher scores. Respondents' scored in the posttest were also compared. The respondents in the experimental group obtained higher scores than the respondents in control group. This means that the Hands-On Minds-On Approach was very effective in increasing the students' academic performance in Science. It is recommended to develop and evaluate other subject areas applying the said approach.

Keywords: Earth and Space, Hands-On Activities, Minds-On Activities, Module, Science 8

INTRODUCTION

In learning specific skill or acquire knowledge, teacher can help student's individualized instruction through integrating different teaching approach. Modular learning is becoming popular because of the concrete application of teaching approaches to address individual differences in which student can proceed at a pace suited to his abilities. A lot of related literatures stated that utilizing different approaches integrated to instructional materials are necessary in order to achieve the objectives of education.

One of these approaches is the Hands-On Minds-On approach. Hands-on Minds-On Approach is defined mainly as any instructional approach involving activity and direct experience with natural phenomena or any educational experience that actively involve students in manipulating objects to gain knowledge or understanding (Ateş, & Eryilmaz, 2011).

The study of Adeyemi and Olaleye (2010), Onasanya and Omosewo (2010), and Naval (2014) are related to this present study in terms of the independent variables utilizing a module but differs in the subject area and the approach, 'Hands-On Minds-On Approach'.

However, Camara (2016) proposed that prior to the utilization of any instructional materials, it should be validated first. In their study, the proposed module can be validated in terms of objectives, content, sequence, graphical presentation, evaluation activities, and consistency [2]. With these, the current module in this study was also validated and evaluated by experts.

This study claims that hands-on and minds-on approach integrated in a module can be one of the interactive engagement methods. Therefore, the main purpose of this study is to develop hands-on/minds-on activities and to investigate the relative effectiveness of instruction with those activities and traditional method on eighth grade students' achievement in science. The results of this study are very important especially for teachers who wish to try other approaches in teaching.

MATERIALS AND METHODS

Respondents of the Study

A pretest was conducted among the Grade 8 students from the two heterogeneous sections at San Josef National High School enrolled during the school year 2018-2019. Thirty (30) participants from each section was selected as participants for experimental and control group.

Instrumentation

The instrument which was used as a data-gathering tool was a pre and post assessment tool. These tools undergone validity testing by means of pilot testing and validation of experts including science teachers, master teachers, head teachers, and program supervisor in science.

Data-gathering Procedure

The researchers sought permission from the Schools Division Superintendent of DepEd Cabanatuan City, through the Principal of San Josef National High School. The researcher received the approval letter to conduct the study. The researcher developed a Module using Science textbooks and downloaded activities from several internet sites applying Hands-On Minds-On

Approach. Most of the activities were modified making each activity appropriate for the learners' age in the same manner that intended knowledge and skills for each science topics will be taught and mastered among students.

To get started, a pretest was conducted among Grade 8 students of San Josef National High School. The respondents were grouped as experimental and controlled.

The experimental group of learners was subjected to instruction utilizing the said approach while the control group to a traditional lecture-discussion approach. After the allotted 40 days for the experimenter, a post test was conducted in both groups to determine the effect of the Hands-On Minds-On approach embedded in the module on the academic performance of the students.

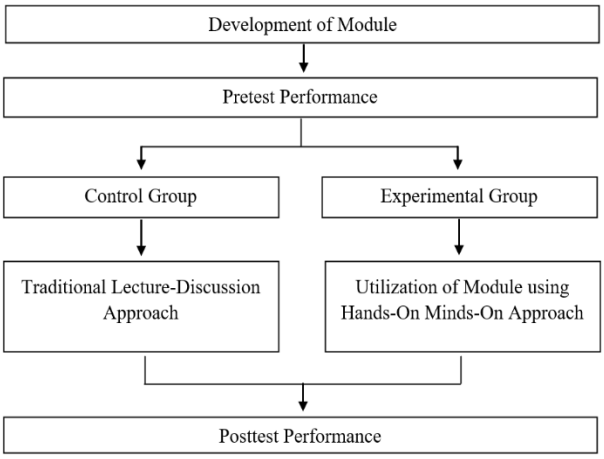

Figure 1. Research Paradigm

Statistical Treatment

Data gathered were processed, tabulated, and interpreted using T-test to determine the difference of assessment results before and after the application of the Module. It will also be used to show the veracity of Hands-On Minds-On approach on the academic performance of the students in Science.

RESULTS AND DISCUSSION

Pretest of Control and Experimental Group

Table 1. Significant Difference in the Pretest Scores of Control and Experimental Groups

	Respondents	N	Mean	t	Sig (2-tailed)
PRETEST	Experimental Group	60	14.5167	0.087	**0.931**
	Control Group	60	14.5667		

significant at 0.05 level (2-tailed)

Table 1 reveals that there was no significant difference in the pretest scores of control and experimental groups based on the computed p-value of 0.931. This means that both groups had the same academic performance before the utilization of the approach. In this case, the use of Hands-On Minds-On approach among the respondents in the experimental group can be done while traditional discussion method can be done among the respondents in the control group. The effectiveness of using the Module among the respondents in the experimental group can then be measured after the administration of the posttest and can be compared to the posttest scores of the respondents from the control group.

Pretest and Posttest of Experimental Group

Table 2. Significant Difference in the Pretest and Posttest Scores of the Experimental Groups

	N	Mean	t	Sig (2-tailed)
PRETEST	60	14.5167	15.543	**0.000**
POST TEST	60	26.8333		

significant at 0.05 level (2-tailed)

Table 2 shows that there was a significant difference in the pretest and posttest scores of experimental groups based on the computed p-value of 0.000. Students' scores were therefore improved after the application of the Module utilizing the Hands-On Minds-On approach, an indication that the academic performance of students in the experimental group have increased.

Posttest of Control and Experimental Group

Table 3. Significant Difference in the Posttest Scores of Control and the Experimental Groups

	Respondents	N	Mean	t	Sig (2-tailed)
POST TEST	Experimental Group	60	26.8333	2.921	**0.0025**
	Control Group	60	23.6667		

significant at 0.05 level (2-tailed)

Based on the computed p-value of 0.0025, there was a significant difference in the posttest scores of respondents in control and experimental groups after the application of the Module. There was transfer of learning among respondents in the control group, but respondents in the experimental groups who utilized the Module applying the Hands-On Minds-On approach had higher scores than the respondents from the control group who were subjected to traditional lecture-discussion approach. This proved that Hands-On Minds-On approach was effective in improving the academic performance of students in Science. It is evident that the module has a desirable pedagogical practice as it helps students to study at their own pace as stated also by Sebastian, 2017 [5]. And according to the result, allowing the students to learn by doing and to learn by their own, allow the students to learn more. A little assistance from the teacher gives students accountability to their learning and gives the teacher extra time facilitating the students.

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