

The Utilization of the Feynman Technique in Paired Team Teaching Towards Enhancing Grade 10 ANHS Students' Academic Achievement in Science

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Abstract

Several scholars in the field of science instruction suggested that various challenges can hinder an individual in learning (Chin et al. [1]; Drinkwater et al. [2]; Huang et al. [3]). Furthermore, the help of other people enhances learning. This study applied the Feynman Technique and the practice of paired team teaching to identify the challenges of students in understanding the concept of evolution in a high school Biology class. The researchers tested 20 students from a Grade 10 Adult Night High School class of a private school in the Philippines. The control group took the class without the intervention while the experimental group was introduced to the intervention. Purposive sampling was used based on the student's class standing before the experiment. A ten-item assessment on the evolution of horses was done after the experiment. The study revealed that there is not enough evidence to prove the existence of a significant difference in the results of the control group ($M=6.646$, $SD=17.9$) and the experimental group ($M=6.653$, $SD=3.71$) for the administered assessment; $t(15)=1.75$, $p=0.05$. It is recommended that the intervention should be tested in a larger population, regardless of grade level and a science subject. This is to validate what other variations of inputs can be created from the Feynman Technique.

Keywords: Feynman technique, high school science, paired team teaching, productivity tools.

Introduction

One of the major goals of education is scientific literacy, which is necessary in the 21st Century. Nair et al. [4] identified that science education prepares students for possible STEM jobs, helps students to understand what happens around the society, and immerses students to be sustainable and productive members of a community. There is a need to introduce learning guide alternatives during studying since it can solve the learning problems students encounter. Productivity tools, like the Feynman Technique, are matrixes or practices individuals use to further supplement their learning, understanding, or completion of a task. Paired team teaching is the process where two learners help each other recall and review a lesson through Socratic questioning. For this paper, the researchers studied a Grade 10 class of the Adult Night High School in the Philippines.

Background

The challenge among many individuals is the ability to use basic competencies to connect certain essential concepts. The prescribed subjects given by the Department of Education of the Philippines for

Junior High School include Science, which covers the following topics: Earth Science, Biology, Chemistry, and Physics. Learning topics in Science has been a problem considering the difficulty in understanding and connecting such concepts. Difficulties in understanding and connecting concepts could come from how the lesson was taught in class. This may possibly be a cause of science anxiety.

Process

The Adult Night High School (ANHS) is an alternative secondary program offered by a private school in the Philippines for adults who are trying to finish their high school diploma. The ANHS offers a Junior High School program (Grades 7 to 10) and a Senior High School program (Technical-Vocational-Livelihood Track). The lone Grade Ten ANHS class, comprising of students aged 15 to 50, was tested. The researchers used purposive sampling in the creation of the two groups. The control group includes 10 students while the experimental group consists of five pairs of students. The following students were paired in the experimental group: a pair of hearing-impaired students, an average student and a below-average student, a pair of average students, and a pair of below-average students.

This paper explains how students will learn and explain concepts in science and on the challenges faced by students in learning science lessons and concepts. The challenges in learning Science were identified and evaluated by the student participants. The experimental group completed their worksheets before doing paired team teaching. Performances of both groups were compared to establish if the application of the Feynman Technique during paired team teaching can improve the understanding of students on a concept of the lesson. The lessons taught during the week of the intervention implementation were the coverage of the assessment.

Results

The student participants identified three challenges in their Feynman Technique worksheets. These include difficulty in identifying a concept of a lesson, difficulty in explaining the concept of a lesson, and difficulty in using English, the medium of instruction. A t-test for two sample means was used to verify the effectiveness of the intervention. A ten-item assessment was done after the experiment. Based on the results, there is not enough evidence to support the researchers' claim that a significant difference in the results of the control group ($M=6.646$, $SD=17.9$) and the experimental group ($M=6.653$, $SD=3.71$) for the administered assessment exists; $t(15)=1.75$, $p=0.05$.

Future Work

It is recommended that the intervention should be tested in a larger population, regardless of grade level and a science subject. This is to validate what other variations of inputs can be created from the Feynman Technique. Furthermore, pre-test and a post-test, testing Lower and Higher Order Thinking Skills, must be done through concept recall and problem-solving. It is also recommended that a Table of Specifications should be used for the creation of the test questions since this will help in identifying the learning competencies being measured and ensuring a fair sampling of questions. A 2x3 Factorial Analysis of Variance should be considered. This may identify the relationship between the concept recall and the result of both assessments. The following factors must be controlled: how the lesson is taught, the type of test to be administered, how the students perceive the intervention, and the teacher during the experiment.

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