

Instructional Scaffolding Through Zap the Gap Approach: Bridging Academic Achievement in Science for Students-at-Risk

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Abstract

Student learning gaps result in today's most serious education challenges - retention and dropouts. This learning gap passed to the next grade become significant, often unsolvable problems that cause teachers to intervene more. This action research was designed to determine the effectivity of instructional scaffolding through Zap the Gap materials in the improvement of academic achievement in Science for students-at-risk. Fifty-five (55) selected grade 6 students were selected and were divided into two groups, the experimental group which used the zap the gap approach in retaining Science concepts in preparation for the National Achievement Test and control group used the reviewer in NAT Science 6. Based on the results, there was no significant difference in the experimental and control group of the selected grade 6 students of Tunasan Elementary school. This means that pupils from both groups had the same understanding of the lesson before the lesson was taught. But after the zap the gap approach was taught, it showed significant difference. This means that the experimental group which used the Zap the Gap Intervention was effective in creating instructional scaffolding and mastery learning which successfully addressed the learning gaps in science concepts.

Keywords: instructional scaffolding technique, learning gap, academic achievement, student-at-risk, mastery learning, teaching and learning skills

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Introduction

Learning gaps result in today's most serious education challenges... retention and dropouts. They lower student achievement in school, on assessments and in life. They undermine our education system by turning learning into a struggle.

A learning gap is formed when a student fails to learn and apply what is expected at a specific point in time and at a specific level of proficiency. Gaps can be identified by comparing learning objectives against learning achievement - the "plan" versus the "actual." The specificity of the comparison determines the usefulness of the information. Student learning gaps passed to the next grade become significant, often unsolvable problems that cause teachers to intervene more.

Based on the results of the 1st and 2nd grading period, It was found out that 18% or 55 out of 303 grade 6 students of Tunasan Elementary School have difficulty in retaining science concepts. These are also the students at risk of retaining, dropping out or may stop schooling.

Many of these students had difficulty in retaining science concepts or fails to learn a specific skill. Understanding gaps, how they impact, how they form, and how they can be illuminated is critical to student success. By minimizing the learning gaps students carry with them, teachers have a good opportunity to succeed in transferring the planned skills and concepts without gaps.

This is where instructional scaffolding needed to support learning. Instructional scaffolding is a process through which a teacher adds supports for students in order to enhance learning and aid in the mastery of tasks. Larkin, M. (2002) coined the term and defined scaffolding as assistance from experts that enables children to achieve what is beyond their ability to accomplish independently. Originally, Alibali (2006) suggests that as student's progress through a task, the teacher use a variety of scaffolds to accommodate students' different levels of knowledge which emphasizes the teacher's role as a more knowledgeable learner to help learners to solve problem-oriented tasks. Lange (2002) states that there are two major steps involved in instructional scaffolding: (1) "development of instructional plans to lead the students from what they already know to a deep understanding of new material," and (2) "execution of the plans, wherein the instructor provides support to the students at every step of the learning process."

According to the study of Kim, M. And Hanaffin, M. (2011), researchers have examined the use and impact of scaffolds in mathematics, science, and reading, comparatively little research has focused on scaffolding learning in real-world, everyday classroom settings. They examined two key constructs (problem solving and scaffolding) and propose a framework that includes essential dimensions to be considered when teachers scaffold student problem solving in technology-rich classes. They then investigated issues related to peer-, teacher-, and technology-enhanced scaffolds, and conclude by examining implications for research.

This action research was designed to determine the effectivity of instructional scaffolding through Zap the Gap approach in the improvement of academic

achievement in Science for students at-risk. Specifically, the study sought to address whether instructional scaffolding through the use of Zap the Gap approach have positive improvement in the learning gaps in Science.

The purpose of this study was to assess the effectivity of instructional scaffolding through Zap the Gap materials in the improvement of academic achievement in Science for selected Grade Six Pupils.

Specifically, this study attempted to answer the following questions:

1. What is the results of academic performance of the experimental and control group in the following:
 - 1.1 Pre-Test
 - 1.2 Post Test
2. What significant difference that exists between the pretest and post test results of the experimental and control group?
3. How would you compare the improvement of academic achievement in Science when the experimental group were grouped according to their level of mastery:
 - 3.1 Beginning mastery
 - 3.2 Approaching mastery
 - 3.3 High degree of mastery
4. How effective are the zap the gap materials in creating instructional scaffolding based from the gained scores?

The null hypothesis stated below was tested using a pretest and post-test on determining the effectivity of instructional scaffolding through Zap the Gap materials in the improvement of academic achievement in Science for selected Grade Six Pupils: Pupils in the experimental group will have no significant change in their pretest and posttest using zap the gap materials at the .05 level of significance.

Fifty-five (55) selected grade 6 students who were identified as at-risk were selected based on their knowledge level as to beginning knowledge, approaching mastery, or high degree of mastery. The students were divided into two groups, the experimental and control group. First, both groups were pretested to determine their level of knowledge. The result of the pre-assessment was used as a guide in making the Zap the Gap intervention.

In the intervention stage, each stage has given simultaneous activity to determine their learning pace. Series of worksheet were given and data were noted.

For the final stage, the researcher monitored and analyzed the trend and analysis of the results between the pre-test and posttest. Data analysis of the results was taken where the difference between the Mean Percentage score is calculated and evaluated.

Descriptive statistics such as MPS and standard deviation were used to analyze the data. T-test of paired samples was used to find the significant difference.

The following were the research instruments used in the study:

Pretest and Post Test were used to assess the level of cognitive ability of students before and after the intervention.

Zap the Gap materials were used during the intervention. Zap the Gaps are referred to exterminating the learning gaps and to fill the holes created by these gaps. A gap is being the difference between where students currently are in their education level and where they should be; to determine a child's learning gap teachers and students should both perform and assess a variety of ongoing task. They were grouped according to their students' knowledge level as to beginning knowledge, approaching mastery, or high degree of mastery.

Table 1. Zap the Gap Materials

Module No.	Topic/Title	Objectives	Grade Level Expectation	Code
1	Human Reproductive System and Their Functions	Describe the structure and function of the human reproductive system	Grade 5	SSLT-IIa-1
2	The Respiratory System and their function	Explain how the respiratory system works.	Grade 4	S4LT-IIa-b-1
3	The Urinary System and their function	Identify parts of the urinary system and their function.	Grade 4	S4LT-IIa-b-1
4	Kinds of Vertebrates	Classify vertebrate into: mammals, birds, reptiles, amphibians or fishes.	Grade 3	S3LT-IIc-d-5
5	Animal Adaptations	Describe characteristics that enable animals to survive in an environment.	Grade 4	S4LT-IIc-d-5
6	Kinds of Plants	Describe characteristics of different kinds of plants.	Grade 5	SSLT-IIg-7
7	Physical and Chemical Change	Differentiate physical from chemical changes/processes by giving examples.	Grade 5	SFMT-Ic-d-2
8	Planets in the Solar System	Describe the distinctive characteristics of planets in the solar system.	Grade 5	BEC
9	The Nervous System and their functions	Identify major parts of the nervous system and their functions.	Grade 6	BEC

10	Circulatory System and their functions	Identify major parts of the circulatory system and their functions.	Grade 6	BEC
11	Energy Forms & their Uses	Identify energy forms and their uses.	Grade 3 Grade 4 Grade 5	S3FE-IIIi-j-3 SFFE-IIIc-3 S4FE-IIIf-g-4
12	Motion	Identify factors that affect the motion of an object	Grade 3	S3FE-IIIc-d-2
13	Earth's Interior Layers	Describe characteristics of the earth's interior layers	Grade 6	BEC
14	Characteristics of Stars	Describe characteristics of stars and how group of stars are useful to people	Grade 6	BEC
15	Theories about the Origin of the Universe	Differentiate the different theories about the Universe.	Grade 6	BEC

This paper adheres to the ethical standards for protection of human subjects of the American Psychological Association (2010). Additionally, a research proposal was submitted and reviewed by the researcher's principal, and was approved.

Parents of the participants were informed during the PTA meeting that their child was participating in the Zap the Gap approach in teaching. As part of the researcher's normal instructional process, assessment scores were reviewed and analyzed. The parent of the participants received a copy of their scores of the pre-assessment.

Conclusions

There was no significant difference on the performance of the experimental group and control group in the pretests. They were of the same level of intelligence and mastery before they were exposed to experiment. Although there was slight difference on their mean score, it was not that significant based on the computed t-value of 0.476 at 0.05 significance level. This attested that both groups of respondents had the same level of mastery before an intervention was introduced to the experimental group and traditional method to the control group.

There was significant difference on the performance of the experimental group in the pretest and posttest. The difference in the mean scores of posttest and pretest of 7.59 was indeed significant. There was a positive transfer of learning in the two groups. However, higher mean was observed from the experimental group after the presentation of the intervention materials.

Zap the Gap materials were effective in creating instructional scaffolding and mastery learning which successfully addressed the learning gaps in science concepts.

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