



EFFECTIVENESS OF A SCAFFOLDING PROGRAMME TO TEACH SCIENCE SUBJECT TO 9TH STANDARD STUDENTS

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Abstract

This study explores the Effectiveness of the Scaffolding Programme in teaching science subjects to 9th Standard Students of Pune City. The objectives of the study are 1. To develop a scaffolding program for selected chapters of science. 2. To find out the effectiveness of a Scaffolding program over the conventional method of teaching science to 9th-standard students. The experimental research method and single-group design were used for this research study. To analyze the data statistical technique mean, SD, graphs, coefficient of correlation, and t-test were used.

The Major findings of the study is the developed 9th std. science-based Scaffolding Programme is effective in teaching Science subjects. Hence, it concludes that the science-based Scaffolding program enhances the learning of 9th std. students.

Key Words: Scaffolding Programme, Science, 9th Standard Student.

Introduction

Scaffolding is a term used in this course about a pedagogue e it means little extended more than a supporting learning or a structuring learning activities scaffolding was proposed (Wood, 1988; Wood, Burner & Ross, 1976). It was originally coined in 1970's. Scaffolding word originally comes from construction and it refers to the temporary platform of building. Scaffolding

is tied to work of a psychologist lev Vygotsky known for a school Cultural theory and his concept of a zone of proximal development element (ZPD) is a distance between what children can do by themselves and the next learning that they can be help to achieve with the competent assistance (Raymond, 2000, p.176). Vygotsky define scaffolding instruction as the role of a teachers and others in supporting the learners development and providing support to get to the to that next stage a level scaffolding is a method of a teaching that help students learn a new skill. Scaffolding has to occur within a kind of “Activity space” known as a zone of proximal development. It involves more knowledgeable persons guiding the student through a task that is their ZPD. Scaffolding learning is a commonly seen as important in classroom learning. Scaffolding play a very important role in students’ current development and potential development level. Students can achieve potential development with the help of scaffolding a supportive learning.

Today's Era is therefore Technology computer and competitive era so to achieve desired level student must require more knowledgeable person who provide the scaffolding to achieve that desired level. In India from ancient time, teacher play important role in education teacher provides a platform for learning students that opportunity to learn and acquire new knowledge and skills. Scaffolding helps the students to become independent and self-regulating learner and problem solvers. Scaffolding facilitate the students’ ability to build a prior knowledge and help them to integrate new knowledge. Education is a lifelong process. The aim of a modern education is the harmonious balance & wholesome development of personality or individual learners. It means the moral, spiritual, intellectual, social, physical, emotional development. All these aspects are equally important and valuable for individual learner. Learner does not exist in alone but it depends on the social interaction. Learner interact with others to achieve desired level with the help of a more knowledgeable person, who provide scaffolding. In the present research study will be a study of effectiveness of scaffolding program to teach science subject to 9th Standard students.

Need of the research study

The Standard of a nation depends upon the Standards of the Citizens. The Standard of Citizens depends upon the Standards of Education and ultimately the most effective factor of education i.e. a Teacher.

As per Education Commission (1964-1966)

“The Destiny of India Is now being shaped in her Classroom”.

The Most important factors in Today's education system is a Learner. Learner needs to tackle different education aspects to achieve Zone of proximal development level (ZPD). It is the important tool in the learners life. As per Len Vygotsky believe that any children could be taught any subject effectively using scaffolding technique by applying the scaffold at ZPD. The ZPD is the one of the two aspects highlighted in the social development theory developed by Vygotsky scaffolding provides a supportive and conducive to learning environment to students but also improves the current and potential development level of a learner.

In Today's education system scaffolding provides students with the supportive learning environment where they can ask questions and receive feedback it also motives the learner, minimizes the frustration for the learner allowed the learner to learn quickly provides personalized teaching experience and also allow for effective learning. In Vygotsky words, *“what child is able to do in a collaboration today he will be able to do independently tomorrow”*. (Vygotsky,1987, p. 211). Vygotsky theorized that learning occurs through the participation in social or cultural embedded experiences (Raymond, 2000, p.176). Learner does not learn in isolation. Learner needs social interaction to achieve new skill or task. An important aspects of scaffolding is that it is a temporary as a learning abilities increase the scaffolding provided by the MKO is a progressively withdrawn. finally, the learner is able to complete the task or master the concept independently (Chang, Sung & Chen, 2002. p.7). therefore, the goal of the educator when using the scaffolding teaching strategy is for the students to become an independent and self-regulating learner and the problem solver (Hartman,2002). As the learners knowledge and learning competency increases the educator gradually reduces the support provided (Ellis, Larkin, Worthington, n. d.). According to Vygotsky's the external surface provides by the educator can be removed because the learner has developed. The scaffolding brings the desired competencies in learners by making learner more independent, self-regulating & problem solver. It develops the cognitive, affective and psychomotor aspects of the students.

Importance of the research study

When the Researcher was a Teacher in Bharat English School in year 2013-2014. she came through the Science topic, later she realized that the curriculum structure within the formal school programme, focusing on the first eight years of schooling, is designed to respond to the psychological and ethical development of the child. It is activity-centered and participatory, based on

games and activities and the resulting discussions. Scaffolding Programme should be allocated supportive learning to each individual learner as per their pace and time.

Scaffolds i.e. supports are very important for learning especially for novice or those experiencing difficulties. When supports are provided to children for learning they perform well and achieve more in their academics. Scaffolding as an instructional strategy was suggested by Brunner (1978) who believed that it supports students for their learning. Blooms (1968) had also explained the same in the 'model of mastery Effect of Scaffolding Strategies on Reading Comprehension 153 learning'. According to the model every student is capable of learning and achieving mastery over a particular task if provided the right support. Bloom suggests providing additional support in teaching-learning process and re-examining and testing and continuing until the learner accomplishes mastery, and then moving on to the next stage.

Review of related literature of the research study

a) Ph.D. Thesis

1. B, Nagalakshmi, April 2017. Scaffolding using picture illustrated stories for the development of language skills among the underprivileged primary level students.

The Objectives of the study - However, globalization and technological advancements transform the teaching learning scenario, still in many parts of the world, many children rely on teachers who have nothing but a blackboard and chalk piece for imparting knowledge and skills. This study aims to reach one such low resource context. This research analyses the root cause of the problems by throwing light on the 15 peripheral areas namely socio cultural milieu of under privileged children, relevance of text book to their level, teachers' CPD, and providing scaffolding using picture story books. To make an ethnographic study on how sociocultural and economic background of underprivileged children affects their early literacy skills. To investigate on how does the curriculum framework prescribed by the government develops/ not develops the language skills of such children. To make an analysis on the primary school teachers' professional skills, their training programmes and sensitivity towards these students' problems. How to provide scaffolding by picture- illustrated stories in language learning by primary school teachers for the development and integration of language skills.

Methodology: - This was a mixed method research. A mixed method design was used.

Summary of Research Findings: - The research involves a three-phase study so as to make an in-depth analysis of the problems faced by the students who come from the economically, socially

disadvantaged sections of the society. The researcher can do justice for the study only when the summary of the findings of the research is presented in three phases as given below.

The statement of the problem

A Study of Effectiveness of Scaffolding Programme to teach science subject to 9th Standard Student of Pune City.

Conceptual definition of the research study

1. Scaffolding: - Scaffolding also called scaffold or staging, is a temporary structure used to support a work crew and materials to aid in the construction, maintenance and repair of buildings, bridges and all other man-made structures. (Dated 11/12/2021 retrieved from <https://en.wikipedia.org/wiki/Scaffolding>)

2. Effectiveness: - Effectiveness is the capability of producing a desired result or the ability to produce desired output. (Dated 11/12/2021 retrieved from <https://en.wikipedia.org/wiki/Effectiveness>)

3. Conventional method: -. A conventional method or product is one that is usually used or that has been in use for a long time. (Dated 11/12/2021 retrieved from <https://www.google.com/search?q=Conventional+method&oq=Conventional+method&aqs=chrome..69i57j69i59l2j0i512l7.1689j0j15&sourceid=chrome&ie=UTF-8>)

4. Science: - Science is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe. (Dated 11/12/2021 retrieved from <https://en.wikipedia.org/wiki/Science>)

5. 9th Standard Student: - Grade 9 is the second year of high school. Students are usually 14–15 years old. In the United States, it is often called the freshman year. (Dated 11/12/2021 retrieved from https://en.wikipedia.org/wiki/Ninth_grade)

Operational definition of the research study

1. Scaffolding Programme: - scaffolding program which means to provide a supportive learning and ideal opportunity motivation problem solving ability independent learning experiences with the help of a fishbowl activity, modelling, demonstration, visual aids, working one-on-one with students, project method, show and tell, give time to talk, pause-ask-questions,-pause-review.

2. Effectiveness: - a significant difference between a mean score of students taught by scaffolding and conventional method measured by post test

3. Conventional method: - a teacher centered teaching method which is a General used in a General classroom teaching

4. Science: - content best knowledge of a science, which is a newly designed for the student of 9th standard students that is accepted and prescribed by Maharashtra state SSC board.

5. 9th Standard Student: - Students of high school level studying in School.

Objectives of the research study

1. To develop scaffolding programme for selected chapters of science.
2. To find out the effectiveness of a Scaffolding programme over conventional method of teaching science to 9th standard students.

Research method of the study: For this research study, experimental research method was used and pre test post test single group design was used for this research study.

Hypothesis of the research study

a) Research hypothesis: - There is a significant difference between mean scores of Pre test and Post test.

b) Null hypothesis: - There is a no significant difference between mean scores of experimental group and control group taught by Scaffolding programme method and Conventional method.

Assumption of the research study

1. 9th standard Science students have a basic knowledge of scaffolding programme.
2. If scaffolding program is actively used, students can learn effectively.

Scope of the research study

- a) The research is related to Scaffolding programme.
- b) The research is related to Effectiveness among the 9th standard Students.

Limitations of the research study

The aspects like attitude, interest, motivation, fatigue are beyond control of the researcher.

Delimitations of the research study

- i) This research study was delimited to 9th standard Student.
- ii) This research study delimited to Science subject.
- iii) This research study delimited to High School Student.
- iv) This research study delimited to Scaffolding Programme.

These variables are under control of the researcher.

Population of the research study: For this research study, the population was consists of 9th standard students from Maharashtra state secondary board the population of present research study.

Sample & sampling method of the research study: For this research study, purposive sampling method from non-probability sampling method used.

Tools for data collection of the research study: For this research, study following Research tools were used. **a.** Questionnaire , **b.** Achievement Tests (Pre test, Post test), **c.** Scaffolding Programme **d.** Opinionnaire

Statistical techniques of the research study: For this research, study following statistical techniques used.

a. Mean: It is stated that sum of the all values of the items in a series is divided by the number of items. Represented by the symbol M.

$$M = \frac{\sum fx}{N} \dots\dots\dots \text{Garrett H. E. (2008, Page No. 29)}$$

b. Standard Deviation: It is stated that the square root of the average of the square of the deviation of each score of the mean. It represented by the symbol Sigma (σ)

$$M = \frac{1}{N} \sqrt{\sum (fx^2/N) - \sum (fx/N)^2} \dots\dots\dots \text{Garrett H. E. (2008, Page No. 32)}$$

c. Coefficient of Correlation: Coefficient of Correlation expressed in terms of the Pearson's Product Moment Method. Coefficient of Correlation designated by letter 'r'
Garrett H. E. (2008, Page No. 112)

d. t- test: Student's t test used to find out significant ratio of the Achievement test (Pre test & Post test)

Research Design: Research design of this study consist of experimental method with single group design.

$$O_1 \text{ X } O_2$$

$$O_1 = \text{Pre- test } O_2 = \text{Post-test (Best \& Khan 2006. Page 173)}$$

Sampling Method: Present research study consists of incidental sampling method. As it is an experimental study, the investigator delimited the area. Therefore, the student educators are selected as the research samples. The researcher selected randomly 31 students out of 50 student from 9th Class.

Table 1: Sample of the study

Sr. No	Design	Exp./Control Group	Total
1	Single Group	31	31

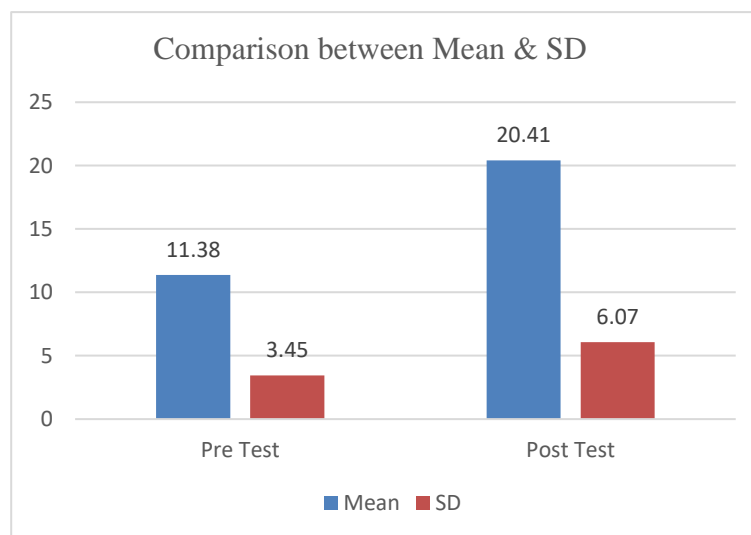
Analysis of Data for Testing Null Hypothesis: The data obtained from post-test of the experimental group analyzed by using appropriate statistical tools and techniques Mean, S.D., t-test. For this, the score of posttest considered.

Table 2: Mean, S.D. & 't' value for Single Group

Test	Mean	SD	t-Value	N	'r'	Calculated t- Value
Pre Test	11.38	3.45	2.75	31	0.26	8.18
Post Test	20.41	6.07				

** Significant at 0.01 level*

Graphical Representation of the Data



Interpretation of the Data

The calculated 't' value is greater than compared with standard values. Therefore, the difference is significant on the level of 0.01 level.

So the research hypothesis is H_1 , accepted i.e. the difference between the means of Pretest and Posttest is trustworthy and dependable to say that Scaffolding Programme is very effective.

The statistical treatments of data show that significant difference in the mean score of Pretest group and Posttest group.

So Therefore Null hypothesis is rejected it is showed by the implementation of Scaffolding Programme to teach Science subject.

Therefore, Scaffolding Programme is more effective teaching method than traditional method for 9th std. students.

Major Findings

The developed 9th std. science based Scaffolding Programme is effective to teach Science subject.

Conclusion: From above finding, it concludes that, the science based Scaffolding programme enhances the learning of 9th std. students.

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