# Study of the Impact of Scaffold Instructions on the Learning Achievements of Post-Graduate Students

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**Abstract**

Scaffolding is an allegory for the construction of a conceptual aid to support beginners for better and easier understanding. The present experimental research was designed to see the scaffold instruction's effect on the learning achievements of post graduate students. An intact group of 60 master students studying at a university campus were distributed in two groups; one as experimental group and the other as control group. The pre/post test was pilot tested before the administration. The two groups having 30 students each were given a pretest. Controlling the extraneous variables, these two groups were taught the course "Research Methods in Education" for one semester (16 weeks). The experimental group received scaffold instructions and the other group was taught with traditional lecture method. After the completion of the semester, the 'post-test' was applied to both of the groups. Comparison of the gain score of two groups revealed that students guided by scaffold instruction achieved better grades than that of the group taught with lecture method. It was concluded that scaffolding helps to clarify concepts even at post-graduate level in complex subjects. Key words: Scaffolding, research methods, learning achievement

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## INTRODUCTION

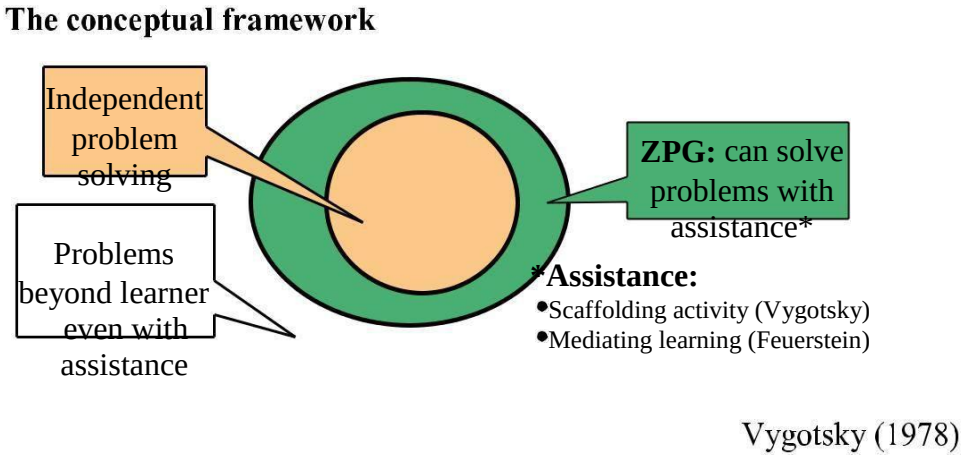
The concept of Scaffolding was first originated by Bruner (1975). Later work was done by Wood and Ross (1976), which was further supported by Vygotsky (1978). Vygotsky recommended that the 'immature learners can complete those tasks which they can't achieve along with the guidance of mature ones.' The scaffold instruction is defined as the organized pattern and sequence of content, tasks, learning materials as well as to optimize learning both teachers and students involvements (Simmons, Chard, & Dickson, 1993). To master new skills, tasks and to be able to comprehend and apply the skills without any guidance, the process of scaffolding supports learners. To present a complex phenomena in simple understandable form as well as visually accessible knowledge, scaffolds are planned guidelines, conceptual framework, pictorial aids or images. To enable individual as an independent learner and mastery new skills and tasks, scaffolds provide incentives for teachers. Teachers can polish students' those potentials that are out of the range of their current abilities (Rosenshine, 1992).

Scaffolding is a way through which teachers lead the learners from something known to unknown. Scaffolds perform as enablers, if accurately managed, in various learning settings. To break knowledge into small components and then leading towards construction and then extension are the forms of scaffolding (Benson, 1997).

Lev Vygotsky operationally conceptualized the term scaffolds with the concept of 'Zone of Proximal Development' (ZPD). The ZPD is properly defined as the gap between actual development level which can be independently established due to problem solving techniques and then the level of optimum development after mature intervention. It is the use of problem solving techniques under the supervision of adults as well as mutual collaborations with more capable peers (Vygotsky, 1978).

Through scaffolds, an expert as well as a more well-informed person can assist the students towards accomplishment of their set goals and to enable them to utilise already learnt skills, tasks and approaches to improve themselves to mastery those skills (Winne & Hadwin, 2001).

Eventually, the internalized expertise achieved through supportive guidance becomes a part of their learning. The wisdom acquired through scaffolding was the instructor's contribution to bring creativity among learners (Vygotsky, 1978).




To deal with complex phenomena, difficult concepts and professional skills, in higher education institutions, several approaches are administered to promote active learning through providing adequate scaffolding instructions. It also supports and encourages collaborative and interactive approaches in active learning classrooms (Crandall, 2002).

To design instructional strategies, the main steps included are appropriate development of instructional plans and implementation of those plans, in which teacher facilitates the students at every step in terms of active learning process (Langer, 2002).

The socio-cultural educational theory explained by Vygotsky emphasized on individual's academic achievement, his theory further refined in recent researches which is useful as teaching aids. The unique notion of scaffolding implies that an expert or well-informed person

guides with the strategies and skills which not only facilitate learners to enable them to accomplish the tasks but to maintain in the forms of modeling, highlighting the critical topics towards tasks and offer hints as well as questions that might support learners to reflect (Wood et al., 1976).

The instructor's role is cognitive, perceptual and effective in the concept of scaffolding (Daniels, 2001). In 1983, Langer recognized five features of scaffoldings as, the first one 'intentionality' interconnected with the clear purposive tasks derived from separate activities that represent to the whole. The second one was 'appropriate' interlinked with the problem based activities during instructional tasks and the third one was 'structure' which involved questioning and modeling process. The next one was 'collaboration' where teacher's role is collaborative towards student's work rather than evaluative. The last one was 'internalization' relatively based on external scaffolding usually conceptualized as the sequence that was internalized by the learners (Applebe, 1983).

**Rationale of the Study**

The concept of scaffolding is increasingly popular among the educators, researchers as well as practitioners. There is need to establish comprehensible theoretical framework towards the basic rules of scaffolding in appropriate ways. Scaffolding techniques have been applicable in lower classes but we are not paying attention to apply these activities in higher classes which are equally challenging. Hence, it is necessary to use such techniques on the post-graduate as well as graduate programs. Moreover, being Pakistani, to meet with the international standards in education and development of lifelong conceptual learning amongst the higher levels. This is the main concern to conduct this research to focus the current problem at advance level educational courses. In Pakistan, many students have opportunity to get the degrees of MPhil and PhDs due to the progressive policies of Higher Education Commission (HEC). The productions of some universities are greater than 200 PhDs within a year. The phenomenon has modified traditional rigorous concept towards researcher's skills as well as critical analysis. Moreover, an increase in quantity may affect quality of research dissertations due to weak conceptual foundations of post graduate students. Hence, the

application of scaffold techniques at higher level is very essential to enhance standards of researches and improve the quality of education. 'Research methods' as a subject, is introduced at both graduate and post-graduate levels in our country in various

Study of the Impact of Scaffold Instructions on the Learning Achievements of Post-Graduate Students programs. There is a need of sufficient knowledge, complex skills and creative thinking for practicing different methods of research.

For novice researches, the relationship among variables, method selections and statistical procedures seem to be a jargon. Use of conceptual maps, tables, grids, visuals, structures and figures are required to clarify the concept. The effectiveness of scaffolding techniques at higher levels of educations makes research methodologies easier to learn and guide students to learn mastery skills and practices.

**Hypothesis**

Ho: There is no significant difference in the 'academic achievements' of students who were administered scaffold instructions and those who were taught through traditional lecture method.

**Procedure of the study**

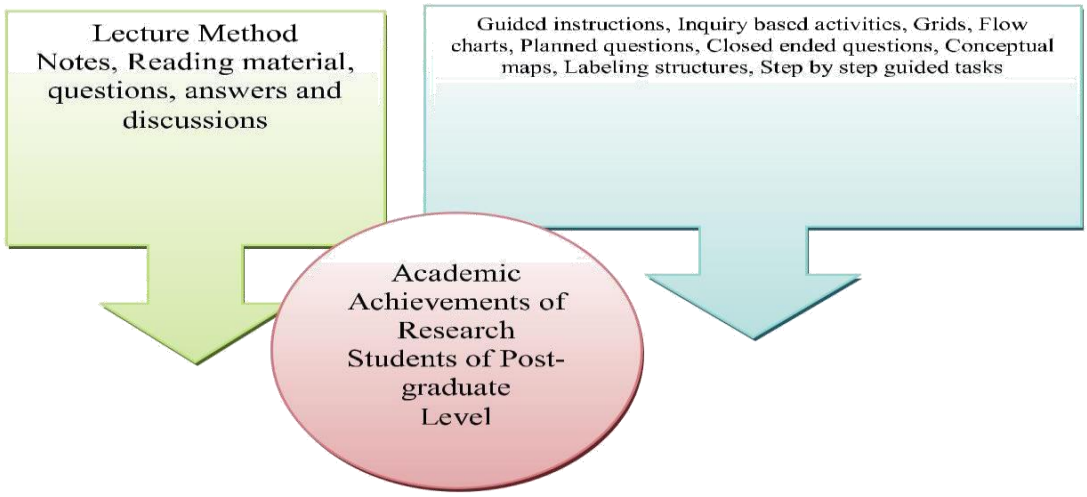
The experimental study was a 'pre-test, post-test control group design'. One group was experimental group and other was control group. The purpose of study was to investigate the impact of scaffold instructions on the learning achievements of 'post-graduate' students. The post-graduate students of subject Education, studying at a sub campus of Punjab University were considered as the population of the study. The intact group of 60 students were taken as the sample of the study. The content of 'Research Methods' was selected, having three credit hours. An achieve test was prepared by the researchers as the instrument and it was validated after pilot testing before administration; the reliability quotient was $\alpha = 0.72$ which showed internal consistency of items. The pre-test (an achievement test) having 25 multiple choice was applied to all students. After administration of the test, the students were distributed into two groups

according to the matched scores achieved in the 'pre-test' for the sake of controlling extraneous variables. The 30 students were in experimental group and the same number of students was selected for control group. The researcher applied scaffold activities to teach the selected chapters to the experimental group prepared by the researcher with the help of experts and the control group was taught with traditional lecture method by the same instructors. The scaffolds entailed grids, structured questions, tables, guided discussions, inquiry based activities, close ended exercises, conceptual maps, flow charts, illustrations and labeling structures, step by step guidelines for relevant tasks and one pager content analysis blue prints.

The control group was taught with lecture method provided notes and reading material. Question answer technique and classroom discussions were continued as per usual practice.

The duration of instructions for both methods continued for 16 weeks. After completion of the chapters, along with the final examination, the 'post-test' was applied as the part of final paper (25 multiple choice) to both experimental and control groups. To find the significant difference of scores between two groups, t-test for paired sample was applied. The final achievement on MCQs test of both experimental and control group was evaluated with the help of t-test also.

**Conceptual framework of the scaffold experiment**




## Results

The scores of pretests of both experimental and control group were subtracted from the posttests individually to get gain scores of both groups in order to determine the original difference of

learning achievement of each student at the end of the study. Finally the mean of gain score of both groups was calculated and tabulated as below:

Table No.1
Descriptive statistics for achievement scores of both experimental and control group

| Improvement in learning | Effect of scaffold instruction | N | Mean | SD |
|---|---|---|---|---|
| | Control group gain score | 30 | .40 | 4.492 |
| | Experimental group gain score | 30 | 9.17 | 4.713 |

Study of the Impact of Scaffold Instructions on the Learning Achievements of Post-Graduate Students The table above showed that the amount of gain score of the control group was N= 30, Mean = .40 and standard deviation = 4.492 where the value of gain score of experimental group was N = 30, Mean = 9.17 and standard deviation = 4. 713. The mean score of experimental group (9.17) was significantly higher than the mean score of control group (0.40).

The findings obtained revealed that the null hypothesis, ‘there is no significant difference in the achievement of students who were taught with scaffold instruction and the students who were taught with the traditional lecture and discussion method’ was rejected with substantial evidence and it was proved that scaffold instructions had a positive effect on the learning achievements of post graduate students.

**Graph showing difference in gain score of both groups**

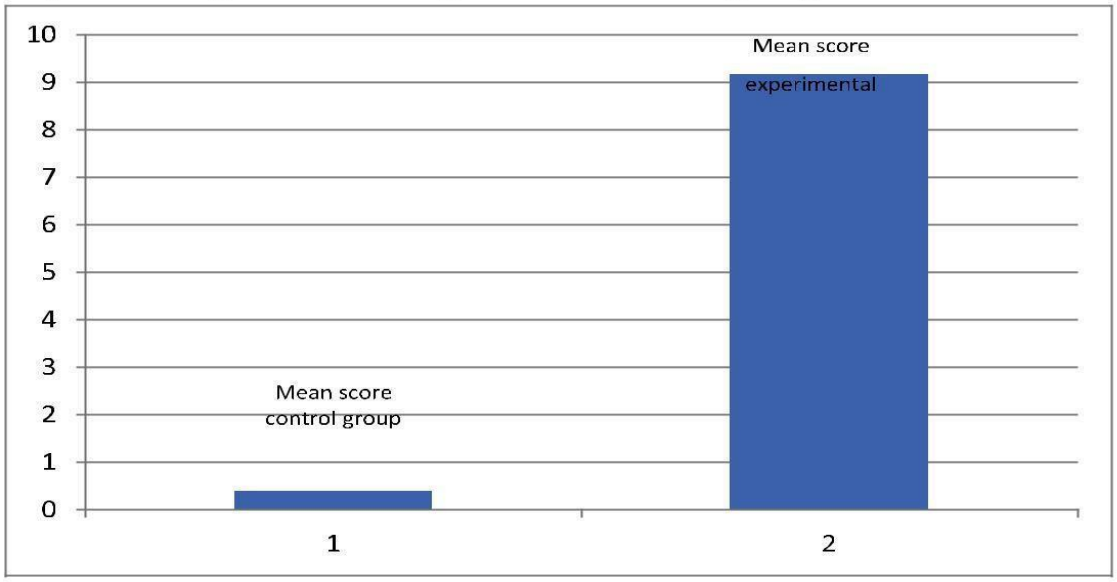



**Table No. 2**

**Comparison of both groups with t-test**

| T-test for Paired sample | | Levene's Test for Equality of Variances | | | | | |
|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | Df | Sig. (2-tailed) | Mean Difference |
| Enhancement in Learning | Equal variances assumed | .510 | .478 | -7.375 | 58 | .000 | -8.767 |
| | Equal variances not assumed | | | -7.375 | 57.867 | .000 | -8.767 |

The table above shows the comparison of mean scores of both experimental and control groups conducted by applying t-test of paired sample at p value .05. It clearly indicates that there was a significant difference between the mean scores of two groups with M= .40 of control group and M=9.17 of experimental group. The t value, t= -7.375 at P= .000 < .05 which declares substantial increment in learning of experimental group.

**Conclusion and Discussion**

The result showed that there was a substantial change in the academic achievements of students who were supported with scaffold instructions as compared to those who were taught with traditional

lecture/discussion methods. The students of research methods gained accurate and precise concepts having scaffolds instruction including flow charts, grids, conceptual maps, pictorial illustrations, prompts, leading questions, guided discussions, tables, and blue prints of content analysis. The learners were capable to grasp the relationship among variables, selection of research methods and various data analysis. The present study supported previous researches Rosenshine, (1992) & Simmons, Chard, & Dickson (1993) showing increased understanding of complex concepts through scaffold instruction. The experimental group exhibited high scores which showed that scaffolds might effectively be applicable at higher education level for teaching complex subjects such as sciences, mathematics, statistics and other logical contents. Scaffolds instructions enable students, at any level of age and education as well to apply new knowledge and skills in real situations. The range of scaffolds might be adapted for various subjects and may prove an effective tool for university teachers to increase learning achievements of adult learners.

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