The Effect of Situational Identification of Teacher's Scaffolding on Students' Better Language Use: A Case Study Based on Speaking Skill on AD Students of Asrar Institute of Higher Education, Mashhad, Iran

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Abstract: This study aims to identify the necessity of scaffolding, and its appropriateness in the process of learning based on Tennyson's IDT (Instructional Design Theory). For this purpose an experimental research is done on students of two classes with the total number of fifty five, one with situational oriented scaffolding, and the other with no teacher's reflection on its appropriateness. Fourteen students of each class (the experimental and the control groups) are randomly selected to be evaluated with the post reading oral activities given to the whole students after each reading task. The result shows significant difference between the scores of the two four groups. Students in experimental group revealed better communicative performances. The data are subjected to analysis based on two samples independent t-test in SPSS package. The results reveal significant high quantitative scores of the class with the appropriate scaffolding design; they correspond to the assumption that students are to be supported with appropriate scaffolding, if any needed.

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1. Introduction

Researches advocate that scaffolding can situate problem identification and engagement by providing apt descriptions, visualizations and resources to students' experiences. Teacher's scaffoldings can assist students as they seek information to manage problems. They can help them find conflicts or dilemmas that hinder their progressing. Students utilize conceptual scaffolds by finding cues and hints (Pol et al., 2009) relevant to background knowledge, reading complex, challenging problem contexts and externalizing their prior knowledge on the problems. Renewed interest in scaffolding has been evident in education research. "Numerous journals have published special issues on scaffolding [The "middle camp" perspective emphasizes both learners' problem solving processes and contextual factors, such as the situatedness of problem context and social interaction in classes (Lajoie, 2000, cited in Kim and Hannafin, 2011). Many researches have been done on the purpose of finding appropriate strategies to scaffold students for better communication. Technological advances, including cognitive technologies (Pea, 1985), technologies of the mind (Salomon et al., 1991), and mind tools (Jonassen, 1996), have afforded researchers unique opportunities to scaffold students' critical thinking and problem solving (cited in Kim and Hannafin, 2011). According to Vygotskky (Woolfolk et al., 2009) much of children's learning is assisted or mediated by teachers and tools in their environment, and most of the guidance is communicated through language. This assistant is called 'scaffolding' (Wood et al., 1976). Some problems are beyond student's ability even if the students are clarified by adequate explanations unless they are helped by "a collaboration of advanced peers" (Wertsch, 1991). The alternative is dynamic assessment (Spector, 1992) or learning potential assessment (Feurestein, 1979,1990). 'The goal of these approaches is to identify the zone of proximal development' (Woolfolk et al., 2009) by asking the students to start communication, and then giving them prompts, hints or prefabricated patterns of speech communication to see how the learner, adapts or uses the scaffolding to solve his problem. The importance of how and when a teacher uses scaffolding is a matter of understanding. Gardner (1993) defines understanding as the capacity to take knowledge, skills and concepts, and apply them appropriately in new situations. Accordingly, having a real concept of scaffolding, teachers can ascertain the effective strategy when helping students, e. g. in teaching some concepts "a picture is worth a thousand words'. In the other hand, teachers are suggested to provide problem situations stimulating

students to questions, explore and experiment, discovery learning Woolfolk (ibid). As a matter of fact, many investigations have been done on the purpose of finding appropriate strategies to better communication more than memorizing and retelling the prefabricated patterns.

"Despite a number of studies on scaffolding [see, for example, applications in mathematics (Schoenfeld, 1991), science (Hogan & Pressley,1997), and reading and writing (Applebee & Langer, 1983; Palincsar, 1986), and studies on diverse scaffolding technologies (Azevedo &Jacobson, 2008)], scaffolding has proven difficult to implement in complex, everyday classrooms" (cited in Kim and Hannafin, 2011). Nowadays, technology has minimized some difficulties by allowing individuals to access interactive materials and obtain just-in-time assistance, but few studies have investigated teacher's roles in use of scaffolding technologies to support students. In science education, for instance, problem solving for inquiry in technology-rich science classes has proven especially popular (Krajcik &Blumenfeld, 2006), yet evidence of implementation, effectiveness and system use suggests that teachers, students, and technology interact differently in controlled versus real-world, everyday school settings.

Oliver and Hannafin (2001) noted that middle school students, when asked to frame and resolve earthquake engineering problems with Knowledge Integration Environments (KIE), relied almost exclusively on procedural scaffolding; while readily available, they rarely sought conceptual support to explore "how or why" questions. Their study does not show student's creativity. Students tended to search for answers that satisfied teachers' expectations rather than challenging with the question. Making students be equipped with prerequisite knowledge satisfy their knowledge potentiality for self discovery.

Similarly, Kim and Hannafin (2011) 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.
Minchi C. Kim a, Michael J. Hannafin (2010) also, identified critical issues in scaffolding students' technology-enhanced problem solving in everyday classrooms. First, 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 then investigated issues related to peer-, teacher-, and technology-enhanced scaffolds, and conclude by examining implications for research. Therefore, there need a caution to be discussed that teacher can be an exploring monitor as model of scaffolding to regularize and harmonize the system critically.

Since, almost, few studies have documented interactions among the two alternatives (ever scaffolding or situational one), this study is carried out, partly to the support of other researches, and mostly to the assessment of the effective scaffolding in classroom activities based on teacher's reflect on action, act to the moment, the need and the sort of identification on scaffolding, a combination of the two traditional and technological scaffoldings as well; That is focusing on verbal cues and question prompts as well as centering on technology-based tools. Thus, teachers are required to thoughtfully asses the type and the extent of supporting, to select and describe an alternative strategy. This is felt likely to be more helpful, to model the new strategy, and finally to support the learner's use of that strategy by a process of scaffolding Williams and Burden (1997).

This study is, basically, on the emphasis of critical understanding of different strategies as the key factors on better use of scaffolding as qualified to the situations as it permits. It emphases on identifying scaffolding based on what kind of scaffolding students need, to which extent scaffolding requires to be, how fast it triggers achieving the goal (in this study oral activities on the benefit to better communication), how exact it may work not to hinder creativity in communication, and how delicate it can affect student's self confidence not to ever rely on teacher's scaffolding, considering the fact that individuals are different. The study also supports student's automaticity that is relying on student's self discovery as there are cases observed in this research where students require not any scaffolding. It has put the emphasis on the importance of identifying appropriate scaffolding by teacher be provided to students for better learning. It aims to asses how much scaffolding can be successful based on teacher-reflect on action and to the moment. In this study situational scaffolding is under investigation; that is teacher's decision making on the dilemma between scaffolding or unscaffolding as well as the extent of scaffolding to the effectiveness on students' better problem solving and their self confidence. As a matter of fact the study is evaluating the emphasis on conceptual understanding of the use of pedagogical patterns, working as scaffolding in the curriculum presented by teacher in class, and the influence they manifest in the form of student's communicative performance.

2. Material and Methods

The current study is done based on an experimental research, and during one university semester. In this study the effect of identification the need and the sort of scaffolding, experimentally is investigated For this reason the two classes (experimental and the control group) are given different pedagogical treatment, the former with the focus on the necessity of scaffolding at appropriate situations, considering the assumption that scaffolding can help only where student's self discovery doesn't help any progress, and the latter with scaffolding where not required.

The study is based on IDT Method, Tennyson's 'Instructional Design Theory' (Reigeluth and Carr-Chellman, 1956). Learning requires active manipulation of the materials to be learned and cannot occur passively (ibid. 1956).IDT identifies good methods for accomplishing goals; it assists in the creation of something by method, model, technology technique, strategy, guidance and heuristic. For this reason the two classes (experimental and the control group) are given different pedagogical treatment, the former with the focus on the necessity of scaffolding at appropriate situations, considering the assumption that scaffolding can help only where student's self discovery doesn't help any progress, and the latter with scaffolding where not required. Accordingly the experimental group is helped by appropriate scaffolding, while the control one is derived from teacher's identification on the need and the sort of scaffolding.

Two General English classes of total fifty five Associate Diploma students, studying in electronic and architectural engineering courses with average age of twenty are selected. Participants are of different genders and at the pre-intermediate level of English language ability which the latter attribute is essentially estimated through a pilot study based on their performance on an Institutional Pre-planned Test (IPT). Fourteen Participants are randomly selected from each class to ask for oral questions related to the aim.

Students are asked to do the reading task selected according to their result on (IPT) and for their better comprehension, different scaffolding are adapted such as prototype, exemplars, prompt, picture, hint, table or diagram, prefabricated speaking patterns, do voicing on dialogues, as well as encouragement, praise, or reward to help students grow in both classes.

Students are asked to do the post reading activities such as answering the comprehension questions, talking around the topic, taking the roles in case of reading a dialogue. Table 1 discriminates the scaffolding, pre and post to the task, between the two groups.

According to Woolfolk et al. (2009), years of research and experience show that teachers cannot expect students to automatically transfer what they learn to new problems unless prompted or guided. The procedure is followed based on the students score on IPT, estimated via a pilot study. In addition to their routine syllabus, students are given different tasks, including reading and speaking around which on the latter the focus of our study is mostly dominated. Tasks are selected based on pre-intermediate communicative ability from different sources and according to the IPT results. Students are divided into two experimental and control groups, the former is provided with conceptual learning pedagogy based on exemplars, prompts, cues, information categorization, illustration, tools such as graphs or charts, and using prototypes each with its suitability identification by teacher as scaffolding to help students basically have conceptual understanding on the text in order to start talking about the selected issue while the latter, the control, is provided with the same but not in a critical way. For example, students are asked to do the reading task, being helped with prefabricated patterns of how to set off talking round the topic, as well as considering the sequence of actions. Table 1 shows part of class activities both in experimental and control group.

Each session the fourteen participants who are randomly selected are asked to do the task activities. The experimental group shows better scores in evaluation. In addition to the scores on oral performances, after three months educational curriculum, students of both, the experimental and the control groups, are given a unique summative test. In spite of the fact that the activities underlying the research are only a part of the pedagogical curriculum, the experimental group does better in the final exam than the control one. Statistical analysis presented in this study is limited to the selected fourteen students.

3. Results

The collected data are subjected to analysis based on two sample independent t-test in SPSS 16. Prior to this, Leven's test is performed on the data to detect the equality of variances. Thus, the result shows non-significant difference between the two group variances ($p>0.05$) i.e. the null hypothesis ($S^2c=S^2e$) indicating the equality of variances of the control and experimental groups is not rejected at 5% significance level. The result of two sample independent t-test assuming equal variances reveals that the mean score of experimental group is

statistically different from that of the control one ($p<0.05$). Figure 1 and Table 2 indicate the result of the descriptive and inferential statistics.

Table 1. Part of the class activities.

Experimental group	Control group
Sequencing the information on power point	Presenting the information in full screen PP
Using prototype in clarifying the reading task e.g. Rostam* for Robin Hood	Reading the task and understanding it by the help of dictionary
Giving examples on collocation e.g. for verbs such as 'do' 'make' 'play' and 'go'	Looking up the phrasal words from dictionary e.g. make friend
Categorizing the words in terms of their suffixes and prefixes as parts of speech	Referring to dictionary for the exact equivalence
How to direct an address by the help of students drawing a city map on the board	Repetition of the book patterns regarding giving address, using the city map of the book
Conceptual understanding via map modeling e.g UK and GB.	Explaining the geographical situation in NL.
Focusing on the pictures on the book for further talking to raise their curiosity on details and their creativity as well	Focusing on the text, and ignoring the pictures
Encouraging self-discovery when no scaffolding needed e.g. finding the time difference between countries by the help of time zones	Scaffolding by giving examples
Encouraging student's creativity when making new sentences	Insisting on prefabricated patterns to be imitated
Do voicing on dialogues by teacher	Role taking by students

Rostam* (Persian: رُستَم pronounced ,[rostæm]) is the national hero of Greater Iran from Zabulistan in Persian mythology and son of Zal and Rudaba. He was immortalized by the 10th century poet Ferdowsi of Tus in the Shahnameh or Epic of Kings, which contain pre-Islamic folklore and history.

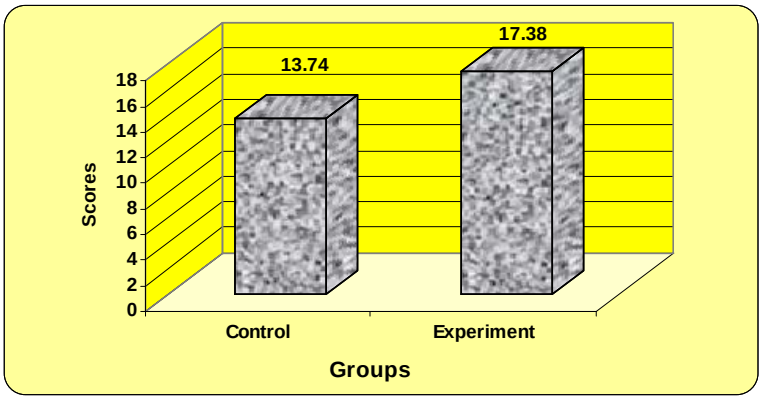

Figure 1. Comparison between mean scores of control and experimental groups.

Table 2. The result of the two-sample t-test shows a significant difference between the scores of experimental group and the control one performed in SPSS.

Group Statistics				
	N	**Mean**	**Std. Deviation**	**Std. Error Mean**
Control	14	14.21	3.09	0.83
Experiment	14	17.14	2.71	0.73

	Levene's Test for Equality of Variances		**t-test for Equality of Means**						
	F	**Sig.**	t	df	**Sig. (2-tailed)**	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.144	**.708**	-2.663	26	**.013**	-2.92857	1.09963	-5.18889	-0.66825

4. Discussions

The result of this research basically supports six major kinds of Tennyson's 'Instructional Design Theory': Instructional event theory, Instructional Analysis Theory, Instructional Planning theory, Instructional Building Theory, Instructional Implementation Theory, and the last one Instructional Evaluation Theory. They all work in a parallel manner and are of useful guidance to practitioners. This study shows how critical thinking works in making decision on when, where, what and how to provide scaffolding. Thus, teachers can identify good methods and models for accomplishing teaching goals (Reigeluth and Carr-Chellman, 1956). It also advocates scaffolding, a term introduced by Bruner (1986); Bruner and Ross (1976) define scaffolding as a controlling those elements of the task that are initially beyond the learner's capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence (cited in Rahimia and Ghanbari, 2011).Therefore, the study reveals the critical role of teachers in the process of instructing learners considering the following notions:

a) Teacher can reflectively explore the necessity of scaffolding regarding the action research; to give way to student approaching to self discovery as there happens to be cases where no scaffolding is required.

b) Regarding the design theory, provide the most effective scaffolding prerequisite to the student's state of frustration so as to avoid blurring the student's self confidence.

c) Although technology-enhanced problem solving, they are to be at the service of class progression not to the service of teacher; teacher can manipulate and control the use of technology since its implementations suggest variable enactment and inconsistent impact.

While there is no dearth of technological tools in many educational systems, there is relatively remained a confusion on how to deploy multiple scaffolds, the interaction between traditional scaffold and technology based one. This study evokes further research to document interactions among the two alternatives. A final caution to be discussed is that according to Pea (2004) exploring models of scaffolding is that learners, tools, and teachers work together as a system, and it is an oversimplification to consider how tools can scaffold learners without considering the other aspects of this system.

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References

1. Pol, H.J., Harskamp, E.G., Suhre, C.J.M., & Goedhart, M.J. (2009). How indirect supportive digital help during and after solving physics problems can improve problem solving abilities. *Computers and Education, 53:* 34-50
2. Lajoie, S.P. (2000). Computers as Cognitive Tools II: No more Walls: Theory Change, Paradigm Shifts and Their Influence on the Use of Computers for Instructional Purposes. Mahwah, NJ: Erlbaum.
3. Pea, R.D. (1985). Beyond amplification: Using the computer to reorganize mental functioning. Educational Psychologist, 20: 167-182.
4. Salomon, G., Perkins, D.N., & Globerson, T. (1991). Partners in cognition: Extending human intelligence with intelligent technologies. Educational Researcher, 20: 2-9.
5. Jonassen, D.H. (1996). Computers in the classroom: Mind tools for critical thinking. Columbus, OH: Merrill/Prentice-Hall.
6. Kim, M. C., & Hannafin, M. J. (2011). Scaffolding 6th graders' problem solving in technology-enhanced science classrooms: A qualitative case study.
7. Woolfolk, A., Winne, P. H., & Perry, N. E. (2009). Cognitive development and language. In Educational Psychology (4th ed., pp. 20-59). Toronto: PearsonCanada Inc. 2001;158(3):286-99.
8. Wood, D., Bruner, J.S., & Ross, G. (1976). The role of tutoring and problem solving. Journal of Child Psychology and Psychiatry, 17: 89-100.
9. Wertsch, J. V. (1991). Voices of the mind: A sociocultural approach to mediated action. Cambridge, MA: Harvard University Press.
10. Spector, J. (1992). Predicting progress in beginning reading: Dynamic assessment of phonemic awareness. Journal of Educational Psychology, 84: 353-363.
11. Feuerstein, R. (1979). The dynamic assessment of retarded adj... performers: The learning potential assessment device, theory, instruments, and techniques. Baltimore: University Park Press.

12. Feuerstein, R. (1990). The theory of structural cognitive modifiability. In B.Z. Presseisen (Ed.), Learning and thinking styles: Classroom applications (pp.68-134).
13. Gardner, H. (1993). Multiple intelligences: The theory in practice. New York: Basic Books.
14. Schoenfeld, A. H. (1991). On mathematics as sense-making: an informal attack on the unfortunate divorce of formal and informal mathematics. In J. F. Boss, D. N. Perkins, & J. W. Segal (Eds.), Informal reasoning and education (pp. 311–344). Hillsdale, NJ: Erlbaum Associates.
15. Hogan, K., & Pressley, M. (1997). Scaffolding student learning: Instructional approaches and issues. Cambridge, MA: Brookline Books.
16. Applebee, A.N., & Langer, J.A. (1983). Instructional scaffolding: Reading and writing as natural language activities. Language arts, 60: 168-175.
17. Azevedo, R., & Jacobson, M. (2008). Advances in scaffolding learning with hypertext and hypermedia: A summary and critical analysis.
18. Krajcik, J.S. & Blumenfeld, P. (2006). Project-based learning. In Sawyer, R. K. (Ed.), the Cambridge handbook of the learning sciences. New York: Cambridge.
19. Williams, M and R L, Burden (1997). "Psychology for language teachers: A social constructivist approach." Cambridge: Cambridge University Press.
20. Bruner, J. (1973). Beyond the Information Given: Studies in the Psychology of Knowing. New York: Norton.
21. Kim, M. C., & Hannafin, M. J. (2011). Scaffolding problem solving in technology-enhanced learning environments (TELEs): Bridging research and theory with practice. Computers & Education, 56: 403-417.
22. Palincsar, A. S. (1986). The role of dialogue in providing scaffolded instruction. Educational Psychologist, 21: 73–98.
23. Plummer, J.D. and Krajcik, J.S. (2010). Building a Learning Progression for Celestial Motion: Elementary Levels from an Earth-Based Perspective. Journal of Research in Science Teaching. doi:10.1002/tea.20355.
24. Reigeluth and Carr-Chellman, (1956), Instructional-design theories and models, Vol ll. published, 2009, Madison Ave. New York
25. Rahimi, A. & Ghanbari, N. (2011).The Impact of Teachers' Scaffolding on Iranian High School Students' Reading Comprehension. Social and Behavioral Sciences, 28: 1072–1075.

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