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Determination of the relationship between the samples of instructional methods and techniques prepared for 4th and 5th grade primary school science and technology curriculum and the principles of situated learning in Turkey

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Abstract

Lauillard (1993) indicated the importance of association between object or fact and situation they included in the process of learning and teaching for educational quality. He supported that knowledge has an environmental nature and it can not be thought seperately from its environment. Besides this, he mentioned that students can not learn the concepts if they do not use. Lave (1996) specified that learning is influenced from the culture it arised, context and application. However at present, it was observed that knowledge presented in classrooms transferred to students abstracting its context and culture. This circumstance is caused usually students' failure solving problems in their real life. According to Young (1993), to prepare appropriate environment for situated learning, teachers should provide to students complex, real and problem-based activities to make their students achieve knowledge. In the process of situated learning, teachers should direct their students until they recognize this process and also they should provide their students necessary advanced information. In recent years, it is true that major changes are experienced in paradigim based on learning/teaching. From point of this view, it important to know that if the approach of situated learning has an in consistency with the sample of instructional methods and techniques presented for the teachers in primary education curriculum which based on constructivist approach and prepared for 4 and 5 grade Science and Technolgy Curricula.

Keywords: S ituated learnig; science and technolgy curriculum; ınstructional methods and techniques.

1. Introduction

The theory behind situated learning or situated cognition arises from the fields of psychology, anthropology, sociology, and cognitive science (Vincini, 2003). Situated learning was first expounded in the *Educational*

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Researcher in 1989 and has made a significant impact on educational thinking (Brown, Collins and Duguid, 1989). According to the researchers meaningful learning will only take place if it is embedded in the social and physical context within which it will be used. To achieve this, they proposed the model of *cognitive apprenticeships,* a method designed to 'enculturate students into authentic practices through activity and social interaction', and based on the successful and traditional apprenticeship model (Brown, Collins and Duguid, 1989).

Jacnick (2008) stated that the concept of situated learning clearly belongs under the umbrella of sociocultural theory, a theoretical perspective where context is believed to deeply affect learning processes. Central of this theory is the importance of learning in the construction of subjectively relevant knowledge and individual learning skills. This learning perspectives posit the primacy of participation in authentic social interaction in order for learning to occur, in this way this learning is situated in social circumstances which are authentic, in terms of the application of that knowledge (Billett,1994).

Herrington and Oliver (2003) mentioned, the critical characteristics of situated learning. They indicated that the critical characteristics of this theory can be examined within a framework of the roles and responsibilities of three mutually constitutive elements of the learning process: *the learner, the implementation* and *the interactive multimedia program.* With respect to their contention, situated learning requires the complete integration of the three elements and it is only when these elements are considered together in the instructional design process that the full value of this evolving instructional model can be gained. They stressed that it is important when designing interactive multimedia to consider all three interacting and overlapping elements and it is not enough to produce a program without thought for how it will be used by the students or how it will be implemented to support the learning process. From this point of view they descibed the critical characteristics of situated learning theory and they believed that useable knowledge is best gained in learning environments which feature the following characteristics. Therefore the learning environments will: provide authentic context that reflect the way the knowledge will be used in real-life, authentic activities; access to expert performances and the modelling of processes; multiple roles and perspectives; coaching and scaffolding at critical times; for integrated assessment of learning within the tasks; promote reflection to enable abstractions to be formed; articulation to enable tacit knowledge to be made explicit and support collaborative construction of knowledge.

Proponents of situated theory approach mentoring in two different ways, either through direct guidance from an expert or through the legitimate peripheral participation model proposed by Lave & Wenger (1991). The first, the method used by Griffin (1995), employs an expert to model and then coach students while they learn the techniques. The expert is not employing the techniques for his/her own benefit, but is using skills to show novices how to apply them. In contrast, within the legitimate peripheral participation model, the entire community of practice is working on the product, and novices learn as much or more from observation of other, somewhat more advanced participants as by direct guidance from an expert.

Situated learning theory based on the assumptions of constructivis approach which can be clarified as "learning is structured through real life context, real tasks and social experiences". In respect of this theory, knowledge is situated and it belongs to part of the context, the cultures it is used and developed. With the development of new curricula at the primary education level in Tukey, the Science and Technology Education curriculum was renewed based on constructivist approach. The major goal of the Science and Technology curriculum makes students scientifically literate persons which means that students should understand the interrelationships among the natural world, technology, and science and apply scientific knowledge and skills to personal decision-making and the analysis of societal issues.

In this study it was tried to display how extent of relationship between principles of situated learning and the sample of methods and technics presented for the teachers in primary education programme which based on constructivist approach and prepared for 4 and 5 grade science and Technology curricula

2. Methods

In this study, the technic of document analysis was used which is existent in qualitative research methods. The sample were obtained from primary school science education programme employed in 2008-2009 academic year and the literature related with educational field. The methods and technics suggested to teachers for related activities in science programme and the principles of situated learning are the major data for this study.

3. Findings and Discussioın

Results showed that there was strong relationship between the methods and techniques accommodated in the new fourth grade Science and Technology Education curriculum and the principles of situated learning theory. This relationship pointed out that comparing with other situated learning principles, *the principles of authentic context, authentic activities, expert performances, multiple roles and perspectives, articulation to enable tacit knowledge and integrated assessment of learning* were accommodated in this curriculum. Providing relevance to the principles of situated learning theory the methods and techniques of concept map, modelling, experiment (experimentation), problem solving, matching oncepts, discussion, questioning- answering, drama, computer assisted instruction, analysing meaning were used in this curriculum.

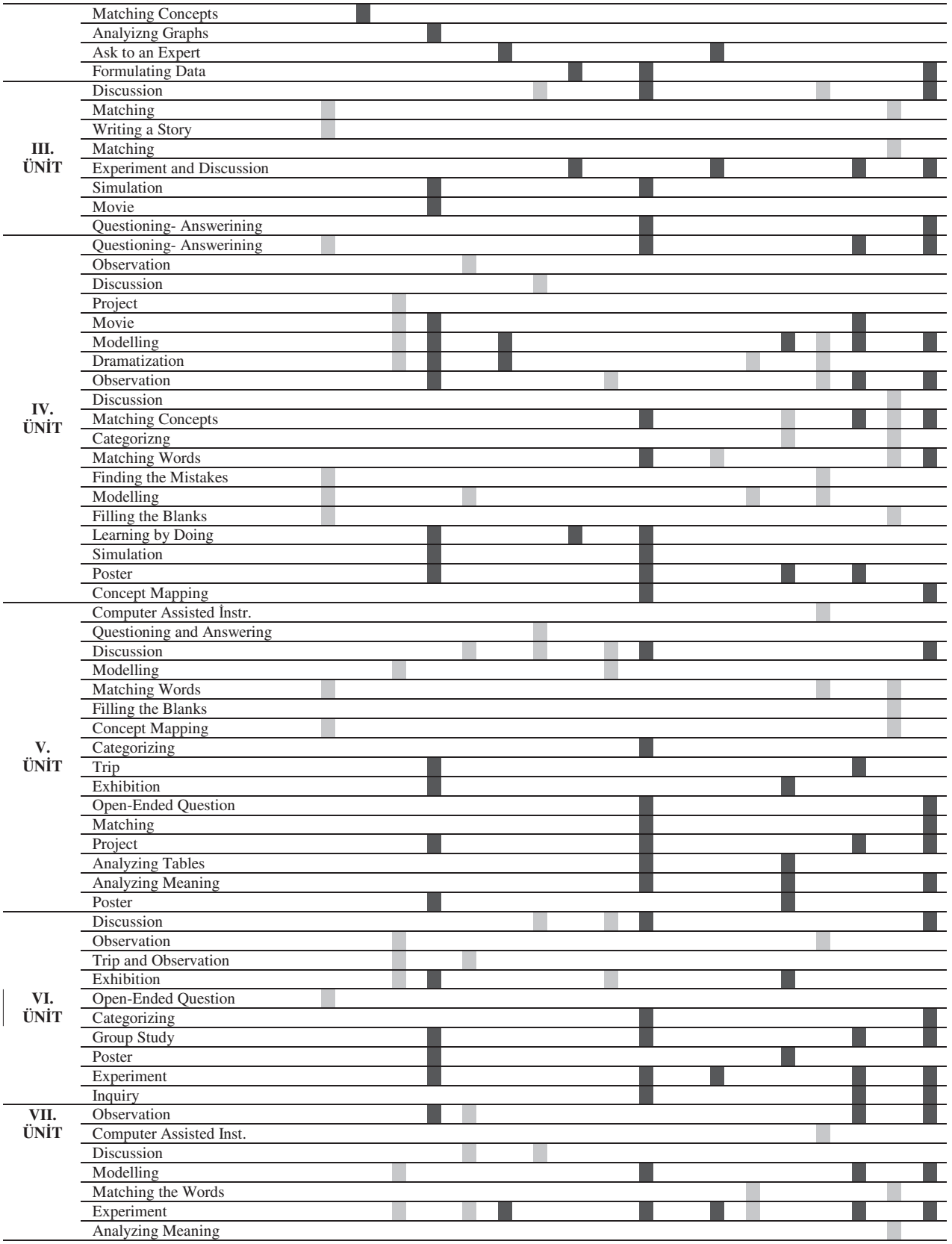
However the results showed that the principle of *collaboration, coaching* and *scaffolding* and *promote reflection* were less accommodated compared with other principles in the new fourth grade Science and Technology curriculum. Providing relevance to the these principles the methods and techniques of discussion, drama, modelling, experimentation and besides interpretation of the graphics and display exhibition were used in this curriculum.

On the other hand analysis of the fifth grade Science and Technology Education curriculum showed the consistency between the methods and techniques presented in this curriculum and the principles of situated learning theory. This relationship pointed out that compared with other situated learning principles, the principles of *authentic activities, collaborative, reflection and integrated assessment of learning* were considered in this curriculum. Providing relevance to the principles of situated learning theory, it can be observed that the methods and techniques of drama, problem solving, exprimentation, displaying poster and exhibition and presenting in front of the expert were used.

However the results showed that the principle of *expert performances, multiple roles and perspectives* were less presented in fifth grade Science and Technology Education curriculum. Through these principles the methods and techniques of watching films, doing project and outdoor activities (trip) and observations were used.

Table 1. The Principles of Situated Learning and Activities of Fourth and Fifth Grade Science and Technology Course at Elemantary Level İn Turkey

	Activities	Authentic context		Authentic activities		Expert performances		Multiple roles and perspectives		Collaborative		Coaching and scaffolding		Reflection		Articulation		İntegrated assessment	
		4	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5
I. ÜNİT	Concept Mapping	▒	■							▒									■
	Modelling	▒				▒				▒		▒				▒			
	Discussion							▒	■			▒							
	Open-Ended Questions		■															▒	
	Analyzing Graphs													▒					
	Puzzle																	▒	
	Matching	▒	■																
	Filing Blanks		■																
	Advertisement				■				■										
	Correct- İncorrect				■														
	Simulation										■								
II. ÜNİT	Experiment and Discussion					▒		▒		▒		▒		▒		▒			
	Brain Storming							▒											
	Discussion		■					▒					■				■		
	Puzzle																	▒	■
	Concept Mapping																	▒	
	Categorizing																	▒	
	Observation					▒		▒											
	Experiment and Observation	▒				▒								▒		▒		▒	
	Drawing Pictures		■								■		■						
	Poster and Project				■						■						■		


Matching Concepts
Analyizng Graphs
Ask to an Expert
Formulating Data
III. ÜNİT
Discussion
Matching
Writing a Story
Matching
Experiment and Discussion
Simulation
Movie
Questioning- Answerining
IV. ÜNİT
Questioning- Answerining
Observation
Discussion
Project
Movie
Modelling
Dramatization
Observation
Discussion
Matching Concepts
Categorizng
Matching Words
Finding the Mistakes
Modelling
Filling the Blanks
Learning by Doing
Simulation
Poster
Concept Mapping
V. ÜNİT
Computer Assisted İnstr.
Questioning and Answering
Discussion
Modelling
Matching Words
Filling the Blanks
Concept Mapping
Categorizing
Trip
Exhibition
Open-Ended Question
Matching
Project
Analyzing Tables
Analyzing Meaning
Poster
VI. ÜNİT
Discussion
Observation
Trip and Observation
Exhibition
Open-Ended Question
Categorizing
Group Study
Poster
Experiment
Inquiry
VII. ÜNİT
Observation
Computer Assisted Inst.
Discussion
Modelling
Matching the Words
Experiment
Analyzing Meaning

Problem Solving	
Concept Mapping	

Table 1 shows that fourth and fifth grades *"Science and Technology"* curriculum include contexts suitable for situated learning theory. The activities presented in the new fourth and fifth grade Science and Technology curriculum were found relevant to the authentic activities. Attending these activities students find and solve the problems they given, in other words, solutions of the problems are discovered by the learners. The most important thing in this principle is that activities should be authentic which means that they should be related with the real world.

From the analysis of the fourth grade Science and Technology Education curriculum, it can be understand that students access to expert performances and modeling of process by doing experiments and project, modelling, and also observing the teachers performing skills before the task. This performances showed the appropriateness of the activities with the principle of expert performances and the modelling of process. However this principle was not sufficiently considered in fifth grade Science and Technology Education curriculum.

Many activities presented in the fourth and fifth grades Science and Technology curriculum contained discussion sessions to get the students perceptions related with the context and some of these activities give the students multiple roles and oppurtunities to explore the context from a number of perspectives. This means that the new fourth grade Science and Technology curriculum gave place to provide multiple roles and perspectives of the learners. On the other hand in the activities of fifth grade Science and Technology Education, students were not given oppurtunities to reveal their perceptions.

A lot of activities presented in the fourth *"Science and Technology"* curriculum included activities to provide students discussing the issues, reporting back, presenting the findings, debating the issue and thus they have the oppurtunity to articulate, negotiate and defend their knowledge. Whilst the activities presented in the new fifth grade Science and Technology curiculum were including sufficient colaborative studies, the activities presented in the new fourth grade Science and Technology curiculum were including insufficient collaborative studies.

However the results of this study showed that the teachers' role in coaching and scaffolding to the students were not enough. Analysis showed that the teachers' role as a coach should be increased. Results of the analysis of the fifth grade *"Science and Technology"* curriculum showed the consistency of the reflection principle and the activities. However in the currirulum of fourth grade the principle of promoting reflection to enable abstractions to be formed was considered insufficiently.

4. Discussion

It can be concluded that many activities seen in the fourth and fifth grades Science and Technology curricula included the principles of situated learning theory. Morever, as it is said before it was found some differences between these two grades levels. Here it was tried to discussed that why such differences could be stemmed from. The reason why accomodating insufficiently the principle of *collaboration, coaching* and *scaffolding* and *promote reflection* compared with other principles in the new fourth grade Science and Technology curriculum may be arised from students' or teachers' attitudes. Hence, teachers ought to give priority collaboration and scaffolding. Also, in order to promote reflection of the students teachers must give much more importance the activities included modeling, analyzing graphs during the situated learning process. The reason why performing insufficiently the principle of *expert performances, multiple roles and perspectives* in fifth grade Science and Technology Education curriculum may be arised from diffulties of such activities. Therefore, teachers should encourage to students' multiple roles and and expert performances in the classroom. To that end, teachers also can give much more responsibilities for the students outside the classroom. Because situated learning activities are in need of moving beyond the classroom. Dramatization serves to activate students' creating thinking abilities and it also contains many activities; such as collaboration, discussion, questioning-answering. It is crucial that using the dramatization techniques in both forth grade and fifth grades curricula. Due to dramatization covers many instructional methods and tehniques in situated learning, it should be given importance as instruction period.

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