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Primary School Teachers' Opinions and Application Levels Related to Constructivist Approach to the Subjects of "Voice and Light"

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Abstract

In Turkey, constructivism has begun to be implemented in education through the new Science and Technology National Curriculum in 2005-2006 school terms. Since 2005, the teachers have been a part of an altering process in education. This process has been emerged as a change for old teachers in the means of both theoretical and practical. Even though the change has occurred in the mean of theoretical through in-service education, unfortunately this change couldn't have occurred in practical mean. In this respect, constructivist approach oriented activities should be more allowed for in the in-service education courses to the teachers. The teachers should be encouraged to make practices about constructivist learning.

The aim of this study is to determine the opinions and application levels of primary school teachers related to constructivist approach. The sample of this study consists of teachers from six primary schools chosen as low, medium and high socioeconomic status by Ministry of National Education in Turkey. In this study, lesson observations and interview records are used as data collection techniques. The data are analyzed by using grid tables with Teacher Pedagogical Philosophy Inventory and Science Teacher Analysis Matrix. Findings from lesson observations and interview records are compared and interpreted together.

As a result of the analysis of the interviews with and observation of the teachers, it is found that all of them, except for two, used non constructivist approaches in their teaching. Other teachers have started to recede didactic (classic-traditional) learning-teaching approaches. Though tree teachers express the non didactic teaching philosophy in the interviews, in the observations, it has been seen that these teachers exhibited wholly didactic teaching learning behaviors.

Keywords: Teacher Pedagogical Philosophy Inventory, Science Teacher Analysis Matrix, Orientation, Science Learning

Introduction

Constructivism and its implementation in education have recently become an important focus for the educational discourse in Turkey. The Ministry of National Education in Turkey (MONE) decided to apply the constructivist approach at primary schools all over the country beginning from 2005-2006 educational years and reshaped the curriculum based on this approach. Of course, the teachers are the ones largely affected from this change. The best structured plans and programs can go away if we do not have competent teachers who

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understand and are committed to the educational goals of the nation. Teachers provide transition between curriculum and learners. Even, the best curriculum will be delivered in a disintegrated manner if the teachers are not adequately equipped and prepared.

Constructivist approach is very popular nowadays in education and many researches about constructivism have been carried out. What is constructivism and where did it come from? While most educators who are aware of constructivism see it as a contemporary learning perspective, constructivism originated as a theory of knowledge, or, if one prefers, an epistemology or philosophy of science (Matthews, 1994; Phillips, 1995; Von Glasersfeld, 1995).

One of the constructivist critic, Phillips (1995, 1998, 2000), has also provided a synopsis of the roots of educational constructivism. Like Von Glasersfeld, Phillips (1995, 1998 and 2000) avers that educational constructivism is a postmodernist philosophy. Phillips's (1995) list of early "constructivist" thinkers includes Kant, Piaget, Kuhn and the American pragmatist philosophers. At the head of Phillips's list is Ernst von Glasersfeld, who has had a great influence on contemporary educational constructivism, particularly in mathematics and science education (Larochelle & Bednarz, 1998; Matthews, 1994, 2000; McCarty & Schwandt, 2000; Phillips, 1995; Solomon, 2000; Steffe & Gale, 1995; Steffe & Thompson, 2000; Tobin, 1993).

The term constructivism has been used in reference to three different things, i) social constructivism ii) psychological/cognitive constructivism and iii) radical constructivism. *Social constructivism* "embodies a thesis about the disciplines or bodies of knowledge that have been built up during the course of human history" (Phillips, 2000, p. 6). Social constructivism attempts to break away from traditional Western dualism "by viewing the knower as part and parcel of socially constituted knowledge" (Petraglia, 1998, p. 111). Social constructivism, therefore, reflects an anti-foundationalist epistemology based on a social theory of knowledge. *Psychological/cognitive constructivism* refers to a set of views of how individuals learn. The constructivists in this area believe that knowledge is actively made and constructed by the learners; and it is called psychological/cognitive constructivism. Phillips (2000) named this area "as psychological, because the center of interest is the psychological understandings of individual learners". No matter whether we name this area of constructivism as psychological or cognitive, it has been explored in two basic areas: cognitive and social constructivism. The cognitive constructivism mainly focuses on individual learning and his/her meaning construction. *Radical Constructivism* is an important part of constructivism, in sociology and philosophy. Based on its historical roots, both Von Glasersfeld and Phillips conclude that educational constructivism is at its core a philosophical, or epistemological and ontological, doctrine.

Based on the publications of the AAAS (1990, 1993) and the NRC (1996, 2000) constructivism has become the favored mode of instruction in science classrooms. The advantages of constructivism are touted as being able to produce students who are independent problem solvers and more ready for the real world. Thus an understanding of the theory and practices of constructivism as well as the history of constructivism should become an important aspect of a science teacher's training.

Research has brought up the importance of constructivism in science teaching. Constructivism is not a theory of teaching; it is a theory of learning and of what is learned. Constructivism cannot dictate how we should teach but it rather informs us how we should search for evidence concerning what it is that we have taught. From the constructivist perspective, how well the teacher teaches is inseparable from how well the students learn (Yager & Lochhead, 1996). Today, constructivism is a popular learning perspective in

science education. Constructivist Peter Fensham (1992) writes that, "The most conspicuous psychological influence on curriculum thinking in science since 1980 has been the constructivist view of learning" (p. 801). One constructivist educator notes that, "Most recent reforms advocated by national professional groups are based on constructivism," including "the National Council for Teachers of Mathematics" and "the National Science Teachers Association" (Fosnot, 1996). Constructivism not only "represents a paradigm change" in science education (Tobin, 1993), but it has been referred to both as "science education's 'grand unifying theory'" (Colburn, 2000, p. 9) and a "world view" (Candy, 1991; Fleer, 1999).

Bredo asserts that while talk of constructivism may begin with "innocuous questions about how children's knowledge develops, or how scientific knowledge has been formed, it quickly leads to much deeper philosophical issues concerning relations between knowledge and reality" (Bredo, 2000, p. 127).

The constructivist approach to science teaching involves strategies that aggressively engage the student in activities that will promote long term learning and aid the student in substituting scientific thinking for prior misconceptions of science. To promote this shift the instructor must insure that students clearly understand their own ideas, that they see the problems with their way of thinking and that the scientific way of thinking about the issues will work better. Teaching strategies that promote these consequences include following the National Science Education Standards, using cooperative learning, using discrepant events, providing chances for prediction and in depth discussion and using assessment that is framed by constructivism (Hoover, 2005). Additionally Hoover feels that laboratory activities that most effectively address misconceptions and build on student learning are those laboratories in which the students have not discussed the results, laboratories that occur before the lecture or discussion, open-ended laboratories in which students construct their own data tables, and laboratories in which the students invent the procedure. In implementing a constructivist teaching style, the teacher must no longer be a seat of all knowledge but should become an assistant that allows the student to be actively involved in his own learning.

Because of the teachers' important role in constructivism, this research designed to determine the teachers' opinions related to constructivism, and the application levels of constructivism.

Methodology

The study is conducted at six primary schools in Aydın with six teachers and at "Voice and Light" subjects in the spring semester of 2008-09 educational year. In the study, a case study that is a kind of qualitative research method is used. Qualitative research is defined as a research that uses qualitative data gathering methods like observation, interview and document analysis. The research that follows qualitative process, aims at bringing up the perceptions and events in a realistic atmosphere (Yıldırım, 1999). As the content related to science, we studied with primary school teachers who are teachers of 4^{th} and 5^{th} grade primary school students.

In the study, a semi-structured interview form consisting of eight items and lesson observations are used as data gathering tools. It has been thought that these items, selected from Teacher Pedagogical Philosophy Inventory (TPPI) survey instrument, are suitable for the research theme and objectives by researchers. "Semi-structured Interview Form" includes open-ended and flexible questions to present the common interview frame. In the interviews TPPI's questions were used (Richardson & Simmons, 1994). This inventory was used in previous studies (Adams & Krockover, 1997; McGlamery & Fluckiger, 2001; Simmons et al.,

1999; Ekici, 2009) and with arranged form in Richardson (2001) and Ekici (2009) to investigate teachers' opinions. Interview data were collected through face to face interviews using questions selected from the TPPI. Questions of the interview form are given at Table 1. In the analysis process these TPPI questions given original inventory numbers in Table 1 have been used with supporting concept maps. Selected TPPI questions were used because of they stated to clarify the teachers' pedagogical philosophy or reasoning behind their teaching practice.

In the literature, though there are several research studies about the misconceptions on light and voice (sound), according to researchers, there is not enough research about teachers' statements about their teaching and their real teaching experience on voice and light topics in these student grades.

Questions at the interview form were asked by the interviewer. Interviews were recorded with a tape recorder and also with taking notes to catch all details of the interview. These interview records were transcribed by the interviewer and controlled again by the teachers.

Table 1. Question items selected from the TPPI inventory

No	TPPI Question Items	TPPI Number
1	What do you consider to be the founding principles of teaching? If you had to write a book describing the principles that teaching should be built on, what would those principles be?	6
2	In what ways do you learn science/mathematics best?	15
3	How do you decide what to teach and what not to teach?	18
4	How do you decide when to move from one concept to another?	19
5	What learning in your classroom do you think will be valuable to your students outside the classroom environment? (Please explain the reasons?)	20
6	How do you believe your students learn best?	29
7	How do you know when your students understand a concept?	30
8	How do you know when learning is occurring, or has occurred in your classroom?	31

Lesson observations analyzed with Science Teacher Analyses Matrix (STAM), (Gallagher & Parker, 1995). Firstly, the several observation forms have been investigated by researchers but, because of the eligibility to the purpose of the study and similarly with the TPPI instrument, it was decided to use the STAM observation form. The STAM observational data were collected by researchers from classroom visit. Teachers taught the subject of "Voice and Light" using instruction methods which they had chosen lesson plans and instruction materials that they had prepared at fifth classes of primary schools. Four lessons of each teacher were recorded with a video recorder. Teachers' names were hidden because of ethical precaution and their names are expressed as A, B, C, D, E, F teacher, in alphabetical order. Demographic properties of teachers were given at Table 2.

TPPI analysis process is appropriate to the content analysis of qualitative research approach and this obtains the analysis process to be clarity. And summary of the codes in grid form in a table obtains the comparison with STAM.

As a result, the TPPI data of the teacher's perceptions of constructivist approach were compared with the STAM data of the teachers' observations of constructivist behavior. From these comparisons, links between the teachers' philosophy and their practice were determined

and reported. Thus, this comparison provides teachers' opinions about learning and teaching between their applications.

Table 2. Teachers' demographic properties

Teacher	Professional Experience	Educational Status	School Type
A	30 years	Teachers Training College-Associate Degree in Correspondence School	High Socioeconomic Status
B	29 years	Teachers Training College	High Socioeconomic Status
C	22 years	Education College of Further Education	Medium Socioeconomic Status
D	24 years	Educational Institute	Medium Socioeconomic Status
E	28 years	Educational Institute	Low Socioeconomic Status
F	13 years	Faculty of Education, Primary Education Teacher	Low Socioeconomic Status

Findings

Findings taken from lesson observations and interview form are analyzed separately and put in tables. Teacher A can be described as *conceptual* from the point of view that subject content structure and teacher-student interaction about subject area. As considered from the point of view that examples and connections, method, teacher's questions and measurement and evaluation types, teacher A is *early constructivist*, science processes and history, laboratory practices and shows, teacher's answers to students' opinions about subject area and sources using, teacher A is *experienced constructivist* and last idea writings and shows and evaluation using except degrees, teacher A is *inquiry constructivist*.

Table 3. Teacher A observation results

Dimensions	Didactic	Transitional	Conceptual	Early Constructivist	Experienced Constructivist	Inquiry Constructivist
Subject content structure			X			
Examples and connections				X		
Science processes and history					X	
Method				X		
Laboratory practices and shows					X	
Teacher-student interaction about subject area			X			
Teacher's questions ……are focused				X		
Measurement and evaluation types				X		
Idea writings and shows						X
Evaluation using except degrees						X
Teacher's answers to students' opinions about subject area					X	
Sources using					X	

Table 4. Teacher B observation results

Dimensions	**Didactic**	**Transitional**	**Conceptual**	**Early Constructivist**	**Experienced Constructivist**	**Inquiry Constructivist**
Subject content structure						**X**
Examples and connections						**X**
Science processes and history						**X**
Method					**X**	
Laboratory practices and shows					**X**	
Teacher-student interaction about subject area						**X**
Teacher's questions ……are focused						**X**
Measurement and evaluation types				**X**		
Idea writings and shows						**X**
Evaluation using except degrees						**X**
Teacher's answers to students' opinions about subject area					**X**	
Sources using					**X**	

Teacher B shows an *inquiry constructivist* teacher structure as evaluated under the title of subject content structure, examples and connections, science processes and history, teacher-student interaction about subject area, teacher's questions, idea writings and shows, evaluation using except degrees.

Teacher B shows an *experienced constructivist* structure from the point of view that method, laboratory practices and shows, teacher's answers to students' opinions about subject area and sources using, and beside this shows an *early constructivist* structure from the point of view that measurement and evaluation types.

Table 5. Teacher C observation results

Dimensions	Didactic	Transitional	Conceptual	Early Constructivist	Experienced Constructivist	Inquiry Constructivist
Subject content structure	X					
Examples and connections	X					
Science processes and history	X					
Method	X					
Laboratory practices and shows	X					
Teacher-student interaction about subject area	X					
Teacher's questions ……are focused	X					
Measurement and evaluation types	X					
Idea writings and shows	X					
Evaluation using except degrees	X					
Teacher's answers to students' opinions about subject area	X					
Sources using	X					

Teacher C shows a traditional teacher behavior and *didactic* structure at every step of instruction beginning from the subject content process.

Table 6. Teacher D observation results

Dimensions	Didactic	Transitional	Conceptual	Early Constructivist	Experienced Constructivist	Inquiry Constructivist
Subject content structure	X					
Examples and connections	X					
Science processes and history	X					
Method	X					
Laboratory practices and shows	X					
Teacher-student interaction about subject area	X					
Teacher's questions ……are focused	X					
Measurement and evaluation types	X					
Idea writings and shows	X					
Evaluation using except degrees	X					
Teacher's answers to students' opinions about subject area	X					
Sources using	X					

It was not possible to put in category teacher D, because of teaching lessons in laboratory without explanation, interaction with students, evaluation and giving permission to students to comment. But in all sides teacher D, shows a *didactic* teacher structure.

Table 7. Teacher E observation results

Dimensions	Didactic	Transitional	Conceptual	Early Constructivist	Experienced Constructivist	Inquiry Constructivist
Subject content structure				X		
Examples and connections				X		
Science processes and history			X			
Method		X				
Laboratory practices and shows		X				
Teacher-student interaction about subject area			X			
Teacher's questions ……are focused			X			
Measurement and evaluation types		X				
Evaluation using except degrees		X				
Teacher's answers to students' opinions about subject area			X			
Idea writings and shows			X			
Sources using		X				

Teacher E can be described as *early constructivist* from the point of view that teacher orientation of examples and connections during subject content process and beside this *transitional* and *conceptual* from the point of view that other evaluation criterions at analysis matrix are considered wholly.

Teacher E is at *transitional* category from the point of view that uses teacher-centered method and carries out the experimental activities oriented and on one mechanism and using a few method and technique as a measurement and evaluation and sources using.

From the point of view that science processes and history, teacher-student interaction about subject area, teacher's questions, teacher's answers to students' opinions about subject area and idea writings and shows, teacher E shows a *conceptual* structure.

Table 8. Teacher F observation results

Dimensions	Didactic	Transitional	Conceptual	Early Constructivist	Experienced Constructivist	Inquiry Constructivist
Subject content structure	X					
Examples and connections			X			
Science processes and history		X				
Method			X			
Laboratory practices and shows			X			
Teacher-student interaction about subject area			X			
Teacher's questions ……are focused	X					
Measurement and evaluation types	X					
Idea writings and shows			X			
Evaluation using except degrees	X					
Teacher's answers to students' opinions about subject area		X				
Sources using	X					

Teacher F shows a *didactic* structure from the point of view that subject content structure, teacher's questions are focused, measurement and evaluation types, evaluation using except degrees and sources using, in spite of this teacher F shows a *transitional* structure from the point of view that science processes and history and teacher's answers to students' opinions about subject area. And except these teacher F, shows a *conceptual* structure from the point of view that examples and connections, method, laboratory practices and shows, teacher-student interaction about subject area and idea writings and shows.

Teacher A shows conceptual and early constructivist structure from the point of view that learning/ teaching philosophy, didactic and early constructivist structure from the point of view that curriculum and subject area, conceptual and early constructivist structure from the point of view that students' learnings and early constructivist and inquiry constructivist structure from the point of view that measurement and evaluation. But findings show that teacher A is at *early constructivist* structure more.

Table 9. Teacher A interview results

	Teacher Centered		Conceptual	Student Centered		
	Didactic	Transitional	Conceptual	Early Const.	Exp. Const.	Inq. Const.
Learning/Teaching Philosophy				6 a, b,c		
			15 e,j	15 f,n		
Curriculum and subject area	18 a,b					
				19 a,i		
Students' Learnings			20f			
				29 f		
Measurement and Evaluation				30 j		
				31 a		31 k

Table 10. Teacher B interview results

	Teacher Centered		Conceptual	Student Centered		
	Didactic	Transitional	Conceptual	Early Const.	Exp. Const.	Inq. Const.
Learning/Teaching Philosophy	6 d, g			6 m		
	15 k, l		15 j,e	15 n		
Curriculum and subject area				18 e,f		
		19 c				
Students' Learnings			20 f			
			29 b, l			
Measurement and Evaluation			30 b			
	31 g	31 i				

Teacher B shows didactic, conceptual and early constructivist structure from the point of view that learning/ teaching philosophy, transitional and early constructivist structure from the point of view that curriculum and subject area, conceptual structure from the point of view that students' learnings and didactic, transitional and conceptual structure from the point of view that measurement and evaluation. But findings show that teacher B is at *conceptual* structure more.

Table 11. Teacher C interview results

	Teacher Centered	Conceptual	Student Centered			
	Didactic	Transitional	Conceptual	Early Const.	Exp. Const.	Inq. Const.
Learning/Teaching Philosophy				6 a,b,c		
	15 l		15 j			
Curriculum and subject area		18 c				
		19 l		19 a		
Students' Learnings						
				29 k		
Measurement and Evaluation			30 b			
	31 g					

Teacher C shows didactic, conceptual and early constructivist structure from the point of view that learning/ teaching philosophy, transitional and early constructivist structure from the point of view that curriculum and subject area, early constructivist structure from the point of view that students' learnings and didactic and conceptual structure from the point of view that measurement and evaluation. But findings show that teacher C is at *early constructivist* structure more.

Table 12. Teacher D interview results

	Teacher Centered		Conceptual	Student Centered		
	Didactic	Transitional	Conceptual	Early Const.	Exp. Const.	Inq. Const.
Learning/Teaching Philosophy	6 d,k			6 a,e		
			15 e,j			
Curriculum and subject area	18 a,b				18 g	
		19 ı				
Students' Learnings			20f			
			29 l			
Measurement and Evaluation			30 b			
	31 g	31 i				

Teacher D shows didactic, conceptual and early constructivist structure from the point of view that learning/teaching philosophy, didactic, transitional and experienced constructivist structure from the point of view that curriculum and subject area, conceptual structure from the point of view that students' learnings and didactic, transitional and conceptual structure from the point of view that measurement and evaluation. But findings show that teacher D is at *conceptual* structure more.

Table 13. Teacher E interview results

	Teacher Centered		Conceptual	Student Centered		
	Didactic	Transitional	Conceptual	Early Const.	Exp. Const.	Inq. Const.
Learning/Teaching Philosophy	6 d			6 e		
	15 l		15 j			
Curriculum and subject area				18 e,f		
	19 d	19 c				
Students' Learnings	20 d					
	29 d	29 c	29 b			
Measurement and Evaluation			30 b			
	31 g	31 i				

Teacher E shows didactic, conceptual and early constructivist structure from the point of view that learning/teaching philosophy, didactic, transitional and early constructivist structure from the point of view that curriculum and subject area, didactic, transitional and conceptual structure from the point of view that students' learnings and didactic, transitional and conceptual structure from the point of view that measurement and evaluation. But findings show that teacher E is at *didactic* structure more.

Table 14. Teacher F interview results

	Teacher Centered		Conceptual	Student Centered		
	Didactic	Transitional	Conceptual	Early Const.	Exp. Const.	Inq. Const.
Learning/Teaching Philosophy	6 d, g			6 m		
	15 l		15 j	15 h		
Curriculum and subject area		18 c				
		19 c				
Students' Learnings			20 f			
			29 l			
Measurement and Evaluation			30 e			
				31 a, f		

Teacher F shows didactic, conceptual and early constructivist structure from the point of view that learning/teaching philosophy, transitional structure from the point of view that curriculum and subject area, conceptual structure from the point of view that students' learnings and conceptual and early constructivist structure from the point of view that measurement and evaluation. But findings show that teacher F is at *conceptual* structure more.

Results and Discussion

In this study, that aimed to determine the primary school teachers' opinions and application levels related to constructivist approach, qualitative research method, interview and observation techniques are used. Teachers' expression forms of themselves are determined with interview records and behavior forms are determined with observation forms.

Findings taken from interview (TPPI) and observation (STAM) records are summarized at Table 15.

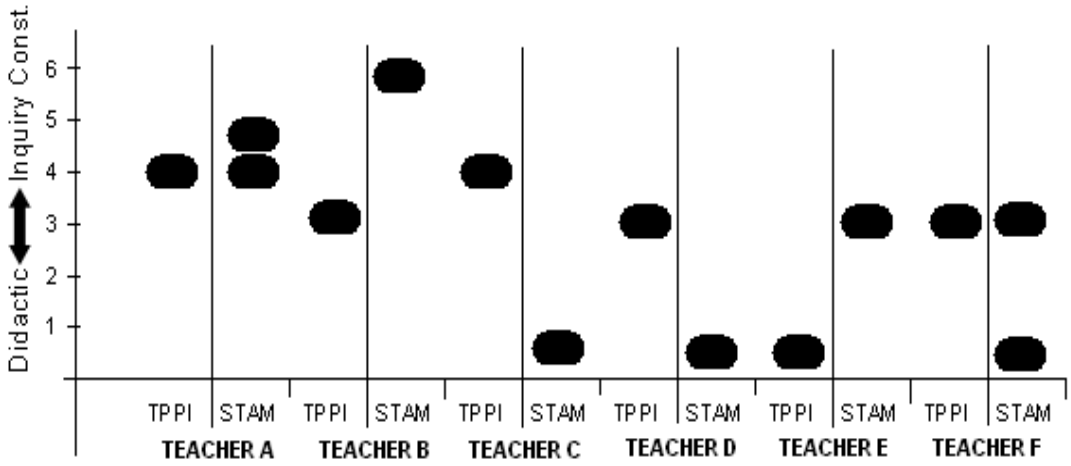

Figure 1. Teachers' analysis findings according to TPPI and STAM (Participant Codes Where 1=Didactic, 2=Transitional, 3=Conceptual, 4=Early Constructivist, 5=Experienced Constructivist, and 6=Inquiry Constructivist)

According to findings taken from the analysis of observation records, as teacher A is determined from the point of view that behavior form, he/she is generally early constructivist and experienced constructivist. Except subject content structure and teacher-student interaction about subject area, teacher A, shows wholly constructivist approach and teach lessons using constructivism. According to findings taken from the interview records, teacher A is at early constructivist structure. As teacher's expression form of him/herself and behavior form compared, it is seen that closeness to constructivism shows a consistency. As teacher B is determined from the point of view that behavior form, he/she generally shows an inquiry constructivist structure. But beside this as he/she determined from the point of view that expression form of him/herself, teacher B is at conceptual structure more.

As teacher C is determined from the point of view that behavior form, teacher C shows a traditional teacher behavior and didactic structure at every step of instruction beginning from the subject content process. Although teacher C expresses him/herself as nearby to constructivism, he/she shows a traditional structure at lessons. As teacher D is determined from the point of view that behavior form, teacher D shows a traditional teacher behavior and didactic structure at every step of instruction beginning from the subject content process. But this teacher shows a conceptual teacher structure as determined from the point of view that expression form of him/her. As teacher E is determined from the point of view that behaviour form, he/she shows a transitional and conceptual structure, beside this he/she is at didactic structure as determined from the point of view that expression form of him/herself. As teacher F is determined from the point of view that behaviour form, he/she generally shows a didactic and conceptual structure, beside this he/she is at conceptual structure as determined from the point of view that expression form of him/herself.

This study reported the distinction between what the participants believed and what they practiced expect teachers at school A and school F. The teacher-centered didactic/transitional code beliefs and actions occurred when the teacher was the chief conduit of the content knowledge; in essence, the teacher transmitted the content knowledge to the passive students.

The teacher delivered factual information from textbooks, videos, and other resource with minimal student input. The conceptual code beliefs and actions occurred when the teacher emphasized the exploratory nature of science. Teachers encouraged some student-to-student interaction and explored science content via important ideas and key concepts. The student-centered early constructivist/experienced constructivist code beliefs and actions occurred when the teacher acted as a facilitator in guiding the students' activities. The students were responsible in acquiring and processing their own scientific knowledge, thereby gaining knowledge through their own actions (Simmons et al., 1999).

The participants displayed in their practice and professed in their interview predominantly teacher-centered transitional and conceptual teaching styles. According to the results of the Salish (1997) and Waggett's (1999) study, one would have expected to find incongruity between the interview responses and the observed behavior. From their studies, one would have predicted that the participant's observed behavior would be more teacher-centered, while the participant's interview responses would be more student-centered (Brown, 2002). My study's results were not contradictory to Simmons et al. (1999) and Waggett's (1999) findings. Consequently, this study reported disagrees between what the participants believed and what they practiced except A and F school teachers.

Conclusions

Constructivism has begun to implemented in education and teaching by the new Science and Technology National Curriculum in 2005-06 school year in Turkey. Since this major change, teachers have been in an alteration process. This process has been emerged a change for existing and old teachers in the means of both theoretical and practical. Even though the change has occurred in the mean of theoretical through in-service education, unfortunately this change couldn't have occurred in practical mean. In this respect, constructivist approach oriented activities should be more allowed for in the in-service education courses to the teachers. The teachers should be encouraged to make practices about constructivist learning.

Existing teachers should improve themselves about constructivism and its applications. They were forced to apply a new philosophy (constructivism) to their learning teaching activities, but unfortunately they were not experienced at applying this approach to teaching and learning. They have just theoretically learned new teaching-learning methods or techniques or strategies which are convenient with constructivism and they were asked to apply this theory to their instruction. Therefore, teachers could only learn to apply new techniques but they had not internalized the new approach or philosophy. For their students, It is requested that they ensure an experience which they didn't live themselves in their learning teaching experience. To achieve this, they need more time. So, because of the teachers did not have such a teaching-learning experience, it should be given more time for their internalization to this new philosophy.

The clause of "Changing biases of peoples more difficult from to split atoms" was spoken by Einstein and this comment is valid for our actual and beginning teachers at the present time, because they were teaching their contents via traditional approaches for years. They will need time and guiding to internalize to new philosophy.

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