Reflection of an In-Service Education Course Program: Pedagogical Content Knowledge about alternative measurement and assessment techniques and Attitude Development

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ABSTRACT The aim of this study is to investigate the effects of an in service training course program related to alternative measurement and assessment techniques on teachers' pedagogical content knowledge and attitudes towards in-service education (INSET). The case study research method was used in this study. The sample of this study consists of 6 science and technology teachers. Achievement test, attitude survey and a semi-structured interview were used for data collection. SPSS 15.0 package program was used in analysis of achievement test and attitude survey. Content analysis was used for interview analysis. At the end of the study; it was found out that, in service training course program had a meaningful effect on improving science and technology teachers' pedagogical content knowledge ($z=2.20$, $p<.05$). It is recommended that, in-service training course program should be arranged to reorganize new curriculums and this course include lots of applications for teachers.
Key words: Alternative measurement and assessment, in-service education

INTRODUCTION

Catching up increasing knowledge and technology is mostly relying on doing reform in education. Educational reform mostly starts with curriculum development. With the establishment of The Turkish Republic many curriculum development studies have been implemented at the primary level; 1924, 1926, 1936, 1948, 1962, 1968, 1980 and at last the new primary school curriculum was prepared in 2004. In 2004; 4th and 5th grade; in 2006, 6th grade; in 2007, 7th grade and at last in 2008, 8th grade started to be implemented the new program.

This new curriculum program (4-8th level) is based on constructivist learning approach and considers students' diversity (MEB, 2006). Students' pre-knowledge considered to be very important in constructivist learning approach (Bodner 1986; Novak 2002; O'shaughnessy, 2006; Sweeney, 2007). Students were centralized and cognitive learning is very important in constructivism (Esmaiel, 2006). In teaching-learning process students construct knowledge and design their own learning (Perkins, 1999; Gold, 2001; Küçüközer et all, 2008). Constructivist learning environment gives opportunity to students to be built their own knowledge (Breen, 1998; Kopinski, 2007).

The new curriculum brings new changes about teaching strategies, approaches and techniques. Also main changes took place in measurement and evaluation area. For example; new curriculum requires a shift from traditional assessment techniques to alternative assessment techniques. New curriculum supports using alternative assessment techniques in learning environment. It comes from the nature of the constructivist learning environment, because it requires using alternative assessment techniques more than traditional assessment techniques (Wright, 2002).

Specially, determining students' performance is very important in science and technology curriculum. Students' progress can be watched with alternative assessment techniques and students are aware of what they learn in every level of the teaching-learning process (Culbertson, 2000). Alternative assessment approach supports using a variety of methods such as; project based assessment, self-assessment, performance based assessment, rubrics, portfolios and so on (Hambleton & Murphy, 1992; MEB, 2006; Çepni, 2007; Zimbicki, 2007; Şenel Çoruhlu, Er Nas & Çepni, 2008). However, alternative assessment techniques are quite new for teachers in Turkey, because these techniques haven't been used before in previous curriculums. The new curriculum enhanced teachers to use alternative assessment techniques and curriculum executors should be familiar with these new techniques. Also many researchers focus classroom teachers' attitudes are very important in a systematic educational reform including curriculum changes (Sarason, 1991; Hargreaves, 1994). Teachers must absorb the philosophy of the new curriculum before implementation of the curriculum (Stein, Mc Robbie, & Ginns, 1999). Changing teacher's philosophy requires teacher awareness about new curriculum (Brady & Kennedy, 1999). If the teacher development does not occur then there is no

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curriculum development. On the other hand, implementation of new curriculum becomes impossible, too (Givens, 2000).

Also Hambleton and Murphy (1992) stated that lack of teacher's experience and awareness are major challenges while using alternative assessment techniques. Gözütok, Akgün and Karacaoğlu (2005) stated that teachers feel the less inadequate while using alternative measuring and evaluating techniques. Furthermore, Johnson (1999) stated that teachers training about alternative assessment help teachers to overcome barriers in learning environments. Therefore science teacher training is very important for professional development (Pittman, 2000; Bekiroğlu, 2004). Growing demands on the teacher's role in education environment lead to the need of advanced in-service training courses (Davies & Preston, 2002). In addition, many researchers stated that teachers need to get in-service training course related to alternative assessment techniques (Hambleton & Murphy 1992; Neukom 2000; Kutlu 2005; Zimbicki 2007; Roach, Elliott & Berndt, 2007; Şenel 2008). Teachers didn't use alternative assessment techniques before the 2004 curriculum in Turkey, so teachers should be educated about new techniques in curriculum. It can be thought that teacher development can be achieved with advanced in service training courses relate to alternative assessment techniques.

The aim of this study is to investigate effects of in-service training course about alternative assessment techniques including portfolio, performance assessment, diagnosis test and structured grid on teachers' pedagogical content knowledge and attitudes towards inset.

METHOD

Case study research was used in this study. Case study allows researchers to investigate research questions in depth for a short time (Denscombe, 1998; Wellington, 2000; Çepni, 2007). The reason for choosing the case study in this research can be explained as; this study is conducted with 6 science and technology teachers and every teacher under investigation accepted as case. Also teacher changes in pedagogical content knowledge and attitude were investigated in depth.

Table 1. *Stages of system approach and what were done in each steps*

Steps of System Approach	Teachers needs were determine	Time-content instruction plan were done	To prepare course evaluation materials	Deficiencies were determined	To apply course program	To apply course evaluation materials
Analysis step	Interviews and surveys were used					
Design step		Instruction plan was done (can be seen in table 2)	Attitude survey, achievement test, and interview questions were prepared			
Developmental step				Course instruction plan and evaluation materials investigated researchers		
Practice step					Course program was applied to participant	
Evaluation step						Evaluation materials were applied to course participants

In-service training course was arranged based on the system approach. This approach was used a lot by Turkey's Ministry of National Education. System approach consists of 5 steps; analysis, design, develop, practice and evaluation. Teachers' needs were determined in the analysis step. Obviously, determination of teacher needs is very important for a successful in-service training course program (Bell, 1999; Kop, 2003). What were done in each step in system approach is presented detail in Table 1.

Procedure

The content of in-service training course program includes some alternative assessment techniques; performance assessment, portfolio, structured grid and diagnosis test. During the course, theoretic knowledge and their practical application with teachers were given. Teachers make some practical workshops and activities about performance assessment, analytical rubric, holistic rubric, structured grid and diagnosis test. Table 2 shows time and content of in-service course program.

Table 2. *Instruction plan of in-service training course program*

Time			Content of in-service course program	Learning outcomes	Methods and techniques	Evaluation materials
Week	Day	Hour				
Week 1	1	5	Measurement and evaluation in education Traditional and alternative assessment Presentation of new 2004 science and technology curriculums' philosophy and learning theories Alternative assessment techniques	To learn new science and technology curriculums' measurement and assessment philosophy To inform about alternative measurement and evaluation techniques	Presentation Demonstration Discussion	To apply achievement test and attitude survey (pre test)
Week 2	2	6	Performance assessment Analytical rubric Holistic rubric Check list Rating scale Observation forms Practice 1 (compose of a performance assessment homework with directive)	To learn what is performance assessment To inform what can be used for performance assessment To compose a performance assessment homework	Presentation Demonstration Discussion Brain storming	
Week 3	3	5	Analytical rubric Holistic rubric Practice 2 (compose of an analytical rubric) Practice 3 (compose of a holistic rubric) Self assessment Peer assessment Anectod record	To compose of an analytical and holistic rubric individual To inform how self assessment, peer assessment and anectod record use in performance assessment	Presentation Demonstration Discussion	
Week 4	4	6	Portfolio Content of portfolio Types of portfolio Teachers, students and parents role in portfolio Advantages and disadvantages of portfolio Evaluation of portfolio	To know what is portfolio, what kind of portfolio To understand teachers, students and students' parents role in portfolio To understand advantages, disadvantages of portfolio To inform how a portfolio used for evaluation	Presentation Demonstration Discussion	
Week 5	5	4	Structured Grid Prepare of structured grid Advantages and disadvantages of structured grid Practice 4 (Compose of structured grid)	To understand which advantages and disadvantages have structured grid To compose of a structured grid individually	Presentation Demonstration Discussion Brain storming	

Table 2 (Devamı). *Instruction plan of in-service training course program*

Time			Content of in-service course program	Learning outcomes	Methods and techniques	Evaluation materials
Week	Day	Hour				
Week 5	6	4	Diagnosis test Prepare of diagnosis test Advantages and disadvantages of diagnosis test Practice 5 (Compose of diagnosis test)	To understand what a diagnosis test present advantages and disadvantages in education To compose of a diagnosis test individually	Presentation Demonstration Discussion	**To apply achievement test and attitude survey (post test), interviews**

Sample

The sample of this study was consisted of 6 science and technology teachers working at an elementary school in Trabzon, Turkey. These teachers were voluntary. Profiles of research sample can be seen in Table 3.

Table 3. *Teacher codes and profiles*

Teachers codes	Age	Gender	Experience year	Teachers' Graduate Department
A	30	Female	5	Physics (Education)
B	37	Male	13	Chemistry (Department)
C	38	Male	14	Chemistry (Education)
D	39	Female	16	Chemistry (Department)
E	43	Male	20	Chemistry (Education)
F	44	Male	9	Physics (Department)

As it seen in table 3, four teachers are males and two teachers are females. Teachers' ages are above 30 and teachers' experience ranged between 5 and 20 years. Half of the teachers are graduated from educational faculties in universities. Also F coded teacher is worked in different sector before working as a teacher. So his experience year is only 9, although his age is 44.

Data collection

In this study; an achievement test, an attitude survey and semi structured interviews including 2 questions were used for data collection.

Achievement test was constructed to evaluate the teachers' pedagogical content knowledge development before and after the in-service education course program. Blooms' cognitive development stages were taken into consideration preparing achievement test questions. Multiple choice questions exist in achievement test consists of knowledge and comprehension level and most of the open ended questions prepared according to comprehension and application level. Also it is known that *Knowledge* level questions involve students to recall or recognition of ideas or concepts; *comprehension* level questions emphasize on student understanding of ideas or concepts; *application* level questions include application knowledge to new situations (Collette and Chiappetta, 1989). In service education instruction program (See Table 2) included theoretic presentation and application about alternative assessment techniques, so achievement test

questions prepared according to course instruction program. We decided to use knowledge, comprehension and application level in bloom taxonomy to overlap course instruction program.

At the beginning the achievement test includes 15 multiple choice questions and 5 open ended questions. The achievement test implemented 40 science and technology teacher students at 4th grade in education faculty. After plot study, the test included 13 multiple questions and 5 open ended questions. Achievement test's content validity was done according to expert opinion. Table of specifications was composed and this table examined to expert whether or not these test questions were overlap to course instruction program. The achievement test's Pearson Sperman Brown reliability was found as (r=0, 88). The achievement test was applied as pre-test and a post-test to the sample. The final version of achievement test cognitive levels showing below in Table 4.

Table 4. *Questions of achievement test and Bloom's cognitive domain*

Questions	Knowledge level	Comprehension level	Application level
1 (m.q)	*		
2 (m.q)		*	
3 (m.q)	*		
4 (m.q)	*		
5 (m.q)		*	
6 (m.q)	*		
7 (m.q)		*	
8 (m.q)		*	
9 (m.q)		*	
10 (m.q)		*	
11 (m.q)	*		
12 (m.q)		*	
13 (m.q)	*		
14 (o.e.q)		*	
15 (o.e.q)			*
16 (o.e.q)			*
17 (o.e.q)		*	
18 (o.e.q)	*		

m.q.: multiple question
o.e.q : open-ended question

Samples are given below.
Knowledge level
Which of the following alternative assessment technique include participating students' parents in evaluation system?
a) Portfolio
b) Performance assessment
c) Self assessment
d) Group/Peer assessment
Comprehensive level
Which of the following doesn't aim of prepare a portfolio?
a) To gain knowledge about students' performance
b) To help students to evaluate themselves and develop sense of responsibility
c)To evaluate students with point not involve process development
d) To communicate with students' parents.
Which of the following does true for alternative measurement and assessment techniques using in new science and technology instruction program?
a) Teaching and learning process are independent each other in these techniques.
b) These techniques emphasis on results not process.
c) These techniques give opportunity students evaluate themselves
d) What student know is more important than what students understand about concept in these techniques.

Application level

Can you develop a rubric (analytic or holistic) for performance assessment and explain each step when you prepare this rubric.

The attitude survey was used by Gökdere (2004) before. This survey included 15 items. Also negative items took part in the survey. Attitude survey was designed to measure teachers' attitudes toward in service education course program. Likert scale was used. Each item was on a five point rating scale (1=strongly disagree and 5=strongly agree). Survey was applied before and at the end of the in-service training course period. Content validity was done according to expert opinion. Survey items examined to experts also 2 expert pointed out that all 15 items took part in attitude survey. Factor analysis didn't use in this study. Attitude survey's cronbach alpha reliability was found .88

Semi-structured interview included two open ended questions. Semi structured interviews aimed to obtain data relate to teachers' attitude towards in service education. First question was related to in-service education course's effect on teachers' professional development and second question was related to in-service education course effect on teachers' attitude towards INSET. Each teacher was interviewed after the in-service training course program and each interview took approximately half an hour.

Data analysis

SPSS 15.0 packet program was used in the analysis of achievement test and attitude survey. Content analysis was used for interview analysis process.

Wilcoxon signed rank test is a non- parametric test and used to analyze the achievement test. In this way the differences between pre test and post test were found out (Büyüköztürk, 2002).

The Pearson correlation is a test to determine the degree of correlation between two variables (Büyüköztürk, 2002) and used for analysis of attitude survey.

Content analysis was used for semi-structured interviews analysis. A matrix form was established in order to coding data. Matrix is a table that illustrates the connections between two variables (Milles & Huberman, 1994; Çepni, 2007).

RESULTS

Findings from the achievement test, the attitude survey and interviews are presented below. Achievement test findings can be seen in Table 5, Table 6 and Table 7; attitude survey's statistical analysis can be seen in Table 8 and Table 9 and semi structured interviews' matrix presented in Table 10 and Table 11.

Table 5. *Participating science and technology teachers' pretest and post test scores*

Teachers Codes	Pre test Score	Post test score
A	39	82
B	24	70
C	21	74
D	28	75
E	23	70
F	33	84

As it can be seen in Table 5 the highest ranj can be seen in C coded teacher's pre test and post test scores.

Wilcoxon Signed Rank test results which applied pre test and post test scores can be seen Table 6.

Table 6. *Result of wilcoxon signed rank test which applied in-service training teachers' pre and post test score*

Post test-Pre test	n	Mean Rank	Sum of Ranks	z	p
Negative Ranks	0	.00	.00	2.20[*]	.027
Positive Ranks	6	3.50	21.00		
Equal	0				

*Based on negative ranks

It was found that (Table 6) there is a significant difference between in service training teachers' pre and post test scores (z=2.20, p<.05). Taking into consideration of mean rank and sum of rank; it is clear that observed difference in favors of the post test towards positive rank.

Table 7. *Teachers' pre-test and post test answers to questions*

Q	Know. level	Comp. level	App. level	A Pre test	A Post test	B Pre test	B Post test	C Pre test	C Post test	D Pre test	D Post test	E Pre test	E Post test	F Pre test	F Post test
1	*			F	T	F	T	F	T	F	T	F	T	F	T
2		*		F	T	F	T	F	T	E	T	E	T	E	T
3	*			T	T	F	T	F	T	T	T	F	T	F	T
4	*			T	T	T	T	T	T	T	T	T	T	T	T
5		*		T	T	T	T	T	T	T	T	F	T	T	T
6	*			F	T	F	T	E	T	T	F	F	T	T	T
7		*		T	T	T	T	E	T	F	T	T	T	T	T
8		*		F	T	F	F	F	F	E	T	T	T	T	F
9		*		F	T	F	T	E	T	T	T	T	T	F	T
10		*		T	T	F	T	E	T	T	T	F	T	T	T
11	*			T	T	T	T	T	T	T	T	T	T	T	T
12		*		T	T	T	T	F	T	F	T	F	T	F	T
13	*			T	T	T	T	F	T	F	T	T	T	T	T
14		*		E	T	E	T	I	T	E	T	E	I	E	I
15			*	E	T	E	T	I	T	E	I	E	I	E	T
16			*	E	T	E	E	I	I	E	T	E	E	I	T
17		*		I	T	E	T	E	T	E	T	I	T	I	I
18	*			E	I	E	I	E	I	E	I	E	I	I	T

F means: Teacher's answer to question is false
T means: Teacher's answer to question is true
E means: Teacher didn't answer this question
I means: Teacher's answer is correct but not adequate

It can be seen that (table 7) teachers mostly answered low cognitive level questions in achievement test. If the question level is high teachers don't answer. Also the teachers found multiple questions easier than open ended questions in pre tests. Almost all of the open ended questions did not answered completely by teachers in pre test. But teachers answered all of the open ended questions in post tests.

Table 8. *Attitude survey's pre test and post test results*

Teachers codes	Pre application Total	Post application Total	Medium of Pre application	Medium of Post application
A	54	57	3,60	3,80
B	52	54	3,47	3,60
C	52	55	3,47	3,67
D	52	59	3,47	3,93
E	50	51	3,33	3,40
F	58	59	3,87	3,93
Total	318	335	3,5328	3,7222

It was seen that (table 8) medium of pre application and post application of teachers' test results were closed to each other.

Pearson correlation test was applied because of the differences between pre test and post test medium. Table 9 shows data from Pearson Correlation Test.

Table 9. *Pearson correlation test applied attitude survey's pre test and post test results*

Measurement	N	$X_{(ort)}$	S	r	r^2
Pre attitude	6	3,5328	0,18	0.722	0,52
Post attitude	6	3,7222	0,20		

Taking into account of determination coefficient ($r^2 =0, 52$) it can be seen that the % 52 ratio change of teachers' attitude results from in-service training course program. It can be seen that teachers' attitude change is not statistically meaningful, but teachers' attitude level is rise to upper level.

Data from semi-structured interviews are presented below.

Teachers' answers to first interview question; "Did the in-service training course program effect your professional development? If your answer is yes or no, can you explain it" is below.

All of the teachers said that the in-service training course program had a positive effect on their professional development. A matrix (in the table 10) showing the themes ranked by teachers as important in process of the professional development was composed below. The table also gives to answer the question *'Did the in-service training course program effect your professional development? If your answer is yes or no, can you explain'*

Table 10. *The themes seen as important in the professional development process*

Themes Codes	Obtaining knowledge	Experiencing concrete samples	Obtaining opportunity balancing theory and practice	Understanding science and technology curriculum philosophy
A	Obtaining knowledge relating portfolio, performance assessment and so on	*No idea	Having opportunity in developing analytic and holistic rubric	Understanding the structure and feature of new curriculum
B	Obtaining knowledge about rubric, grid, portfolio	Search concrete samples relating alternative assessment techniques	*No idea	*No idea
C	Obtaining knowledge about rubrics	*No idea	Having opportunity about improving rubric	Understanding new curriculum's philosophy in measurement and evaluation
D	Learning techniques about how to use alternative assessment	Search concrete samples relating analytic and holistic rubric	Having opportunity about improving holistic rubric	* No idea
E	Obtaining knowledge about portfolio, performance assessment, and how to evaluate with these techniques	* No idea	Having opportunity about different techniques such as; grid, diagnosis test, rubric	Understanding new curriculum's philosophy
F	Learning how to compose a portfolio	Experiencing specifically what a portfolio include	* No idea	* No idea

As it can be seen in Table 10, the in-service training course had a positive effect on teachers' development concerning in both area; theoretic knowledge and abilities in applying the new alternative assessment techniques.

Teachers' answers to the second interview question "Did the in-service education course program influence your attitude towards in-service training program in general. If your answer is yes or no can you explain reasons?" is presented below in Table 11.

Table 11. *The themes seen as important in the attitude development*

Themes / Codes	Teacher needs	Debates	Practices	Course environment	Difficult practices
A	This course is overlap to our needs	* No idea	Doing practices in course can contributed to our attitude of using this techniques	* No idea	I had difficulties to compose the sub performance criteria for analytic rubric
B	We don't understand the alternative assessment techniques and this course met our needs.	* No idea	* No idea	* No idea	* No idea
C	This in-service training consistent with our needs	The debates in the course can contributed to our development	* No idea	Course environment is warm	The most difficult practice was the composing of the analytic rubric. I had difficulties while determining the sub performance criteria.
D	We need to in service training relating alternative assessment techniques.	* No idea	Application of practices can helped on our development	* No idea	Converting performance level to a performance criteria is very difficult and to evaluate performance criteria is also very difficult
E	* No idea	The debates between teachers are helpful to our development	* No idea	We took a course relating alternative assessment before, but this course environment is warmer than before.	* No idea
F	This course is address to our needs	* No idea	* No idea	* No idea	* No idea

Almost all of the teachers stated that the in-service education course had positive effect to teachers' attitudes towards the in-service education. Teachers gave the emphasis on the idea that 'new curriculum brings new changes and we don't understand lots of things in the new curriculum and this course was arranged to overlap our needs, so we glad to join this course'. Only three teachers stated that difficult activities like 'compose of an analytic rubric' affected our attitude the new assessment techniques because of the difficulties in preparing.

DISCUSSION

This study focuses on the contribution of an in-service training course to teachers' professional development including teachers' pedagogical content knowledge and attitude development towards INSET. An achievement test, attitude survey and interview questions were used to reach this aim.

The achievement test included both multiple questions and open ended questions. There are a lot of studies in literature using open ended questions and multiple choice questions to determine teachers' pedagogical content knowledge improvement (Kanlı 2001; Kaya, 2003; Gökdere 2004; Tekin 2004). In this study, teachers' pre-test answers were investigated in depth and teachers didn't answered questions accurately in pre test. Also it can be seen in teachers' pre test scores (see Table 5). The reason for this finding could be explained that teachers started to use alternative assessment techniques even having very little information. It can be said that, teachers were insufficient before the in-service course program. Also many researchers in Turkey emphasis on the teachers' adequacies on theoretical knowledge and using alternative assessment in practice (Gözütok et all 2005; Kutlu, 2005; Erdemir, 2007; Bacanak 2008). Samely, Kutlu (2005), stated that teachers haven't got adequate knowledge about alternative assessment techniques and Gözütok et all (2005), emphasis that in service education courses relating curriculum didn't give adequate information about alternative assessment techniques and teachers started to use these techniques with little adequacy.

Wilcoxon signed rank test was applied the achievement test. It was seen that there was a significant difference between pre and post-test scores ($z=2.20$, $p<.05$). It was stated that, the in-service training course program had meaningful effect on teachers' pedagogical content knowledge development. This finding is consistent with Tekin (2004), who found that in-service education course supports participants' cognitive learning about learning theories, instruction models and techniques using in meaningful learning process. This course contributed on teachers' pedagogical knowledge development about alternative assessment techniques. The reason for this finding could be explained that teachers didn't have enough information about alternative assessment techniques and they inform alternative assessment techniques such as; portfolio, performance assessment, structured grid and so on with this course. Also activities in in-service education course program can lead to this improvement. Similar studies (Anderson, Harty & Samuel, 1986; King, 1991; Zoller, Donn, Wild & Beckett, 1991) found that in service education workshops promote understanding of teachers. Also, it is known that teacher need in-service education relate to alternative assessment techniques (Hambleton & Murphy 1992; Neukom 2000; Kutlu 2005; Zimbicki 2007; Roach, Elliott & Berndt, 2007; Bacanak, 2008; Şenel et all, 2008).

After the examined answers of teachers' pre-test and post-test; it was showed that teachers answered multiple questions better than open ended questions. The reason for this finding could be caused of knowledge and comprehensive level questions can be answered easier than application level questions. Open ended questions including 'compose of a rubric', 'understand new curriculum philosophy' and 'compose of performance assessment homework with directive'. Also teachers didn't answer or gave wrong answers to the open ended questions in pre test, but almost all of the teachers answered questions in post test. It can be thought that; practices doing by teachers during in-service training course program can lead to this improvement. Because teachers had opportunities in doing practices related to; performance assessment, analytic rubric, holistic rubric, structured grid and diagnosis test. Apart from the teachers' pedagogical content knowledge skills in putting them practice were also developed during the in-service course program. The reason for this finding can be explained with activities doing by teachers in course times (See Table 2). Also, Makang (2003), found that hands on learning activities in in-service courses had contributed on teachers development. Similar to previous researcher Mcgowin (1996), we found that workshops doing in-service course can improve teachers' knowledge about assessment. In this point Klein (1996), states that an effective in-service science teacher training should provide skill enhancement for teachers. The findings in this study is consisted with Kop (2003), who arranged an in-service training course program to introduce new science program, such an in-service training course program was not so effective for teachers because this course had to much theoretical information which was not including any practical implication for teachers.

Attitude survey was applied to 6 science and technology teachers' pre test and post test. Pearson correlation test was used to analyze the attitude survey. It can be seen that teacher's attitudes change towards positive. It is found out that the reason of 52 percent attitude change is mainly caused by in-

service training course program. The remaining of the 48 percent change is caused by other factors. But teachers' attitude change is not statistically meaningful (see Table 9). Also it is known that changing attitudes in a very short time is very difficult (Şengül & Ekinözü, 2006). It can be thought that attitude change requires long time. It is found out that, science and technology teachers have positive attitude before in-service training course have started, but at the end of the in-service training course, teachers' attitude changed positively to upper level. The reason for the change in teacher attitude caused by in-service training course program, which was prepared based on teacher needs. Also it can be thought that teachers' positive attitude change stem from in-service training course program including alternative assessment techniques, which are new and interesting for teachers in Turkey. Teachers want to join in service education course program. Also similar studies (Hambleton & Murphy 1992; Neukom 2000; Kutlu, 2005; Erdemir 2007; Zimbicki 2007) found that teachers need training relate to alternative assessment techniques. Samely, Degroot (1995) stated that in service courses are more effective to change teachers attitude, if teachers are active in need determine process or the in-service course presents new information that include practical application for teachers. This in-service course arranged based on teacher needs and include practices for teachers also. Teachers enable to understand the philosophy of new curriculum, gain knowledge and experience with practices in in-service education. Teachers' attitude change towards positive, but is not statistically meaningful. Some teachers thought that difficult activities can lead to this situation. Also teachers had difficulties to find sub performance criteria to compose an analytic rubric. Luft (1999) stated that composing of an analytic rubric is a challenging activity because it requires structuring of sub performance criteria. Similar to previous researchers' Şenel Çoruhlu (2008) et all, we found out that composing an analytic rubric was found difficult by teachers. Teachers did difficult activities like 'composing an analytic rubric' in service education course program. But teachers' attitudes return to positive with respect to in-service education course program which based on teachers' needs.

CONCLUSION AND IMPLICATION

The new curriculum brings new changes in measurement and evaluation area. The curriculum wants teachers to use alternative assessment techniques in educational environment. But it can be seen in this study that teachers started to use these new assessment techniques with very little information. They need to in-service education course. This study was conducted to overlap this deficiency in the literature. This study aimed to investigate in-service teachers' attitude and pedagogical knowledge development after an in-service education course program.

In-service training course had a positive effect on teachers' pedagogical content knowledge development. This result was consistent with the findings by Berg 2001; Kaya, 2003; Tekin, 2004; Gökdere, 2004. There are a lot of studies relating in service education courses' positive impact on the development of teachers' pedagogical content knowledge (Mcgowin, 1996; Kaya 2003; Makang, 2003; Tekin, 2004; Sandberg, 2007). Teachers experience about alternative assessment techniques developed because of applications which placed in-service training course content. This result was consistent with Makang (2003) who emphasis that activities can contributed on teachers' pedagogical knowledge development. Teachers do activities relate to alternative assessment techniques. These activities can contribute teachers' pedagogical knowledge and also skill development.

In service education courses which based on teachers' needs are effect on participants' attitudes. Samely Degroot (1995), found that in-service education courses based on teachers' needs had positive impact on the development of teachers' attitudes towards inset. In this study, however, the in-service education course did not change teachers' attitudes towards inset statistically meaningful (see Table 9).

It can be concluded that in-service education course developed teachers' pedagogical knowledge about alternative assessment techniques, some extent change teachers' attitude towards inset but this change is not statistically meaningful.

Based on the findings in this research, the following suggestions can be made:

To develop teachers' pedagogical content knowledge about alternative assessment techniques, in-service training course program not only include theoretical information but also include practical activities for teachers. Because teachers gain possibility for practices and apply theoretical information. Also in-service education course program should be included all alternative assessment techniques and this course give possibility to teachers application of these new techniques.

In-service training course program should be arranged based on teachers' needs. If teachers' need is taken into consideration while preparing an in-service training course, teachers would want to participate in the in-service training course, so the teachers' attitude toward in-service training could be improved.

In service training course should be arranged in order to acknowledge new curriculums. Teachers can understand the philosophy of new curriculums with respect to in service training courses. Also in-service training course program should include practices for teachers. Teachers enable to learn and use the new techniques with practices and gained experiences. Also future researches can be done relate to investigate in service education courses long term effects. Follow up studies should be done for this aim.

This research is pointed out many important findings. But this study included a limited participants, future research should be done with large samples.

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Hizmet içi Eğitim Kurs Programından Yansımalar: Alternatif Ölçme Değerlendirme Teknikleri Hakkında Pedagojik Alan Bilgisi ve Tutum Gelişimi

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ÖZ: Bu çalışmanın amacı; alternatif ölçme değerlendirme teknikleri ile ilgili olarak düzenlenen hizmet içi eğitim kursunun, kursa katılan öğretmenlerin pedagojik alan bilgileri ve hizmet içi eğitim kursuna karşı tutumları üzerine olan etkisini araştırmaktır. Çalışmada özel durum yöntemi kullanılmıştır. Çalışmanın örneklemini 6 Fen ve Teknoloji öğretmeni oluşturmuştur. Veri toplama aracı olarak; başarı testi, tutum anketi ve yarı yapılandırılmış mülakatlar kullanılmıştır. Başarı testi ve tutum anketi verilerinin analizinde SPSS 15.0 paket programı kullanılmıştır. Mülakat sorularının analizinde içerik analizinden yararlanılmıştır. Araştırmanın sonucunda; düzenlenen hizmet içi eğitim kurs programının kursa katılan öğretmenlerin pedagojik alan bilgilerinin değişiminde anlamlı bir etkide bulunduğu sonucuna ulaşılmıştır ($z=2.20$, $p<.05$). Yeni öğretim programının öğretmenlere tanıtımı amacıyla hizmet içi eğitim kurs programlarının düzenlenmesi ve bu kurslarda uygulamalara yer verilerek öğretmenlerin öğrenmelerine katkıda bulunulacak ortamların oluşturulması gerektiği öneri olarak sunulmuştur.

Anahtar kelimeler: Alternatif ölçme ve değerlendirme, hizmet içi eğitim.

Araştırmanın problemi: Ülkemizde 2006 yılında yeni Fen ve Teknoloji Öğretim Programı geliştirilmiş ve uygulanmaya başlanmıştır. Programda ölçme ve değerlendirme boyutuna ayrı vurgu yapılmaktadır ve bu boyut köklü değişiklikler içermektedir. Program üründen daha çok sürecin değerlendirilmesi üzerine odaklanan alternatif ölçme değerlendirme tekniklerinin kullanılması üzerine odaklanmaktadır. Bu açıdan bu teknikleri kullanacak öğretmenlerin belli bilgi ve becerileri sahip olmaları gerekmektedir. Mevcut literatür incelendiğinde ise öğretmenlerin yeni olan bu teknikleri kullanabilme bilgi ve becerisine sahip olmadıkları görülmektedir.

Bu çalışmanın amacı; Alternatif ölçme ve değerlendirme tekniklerinden olan öğrenci ürün dosyası, performans değerlendirme, yapılandırılmış grid ve tanılayıcı dallanmış ağaç tekniklerini içeren bir hizmet içi eğitim kursunun kursa katılan Fen ve Teknoloji öğretmenlerinin pedagojik alan bilgileri ve hizmet içi eğitime yönelik tutumlarındaki değişimi araştırmaktır.

Yöntem: Bu çalışmada özel durum yöntemi kullanılmıştır. Araştırmanın örneklemini 6 Fen ve Teknoloji öğretmeni oluşturmuştur. Araştırmada veri toplama aracı olarak; başarı testi, tutum anketi ve mülakat kullanılmıştır. Başarı testi çoktan seçmeli ve açık uçlu sorulardan oluşmuştur. Başarı testi soruları Bloom taksonomisinin bilişsel alan basamaklarına uygun olarak hazırlanmıştır. Başarı testi ve tutum anketinden elde edilen veriler SPSS'de analiz edilmiştir. Mülakattan elde edilen veriler içerik analizine uygun olarak analiz edilmiş kodlamalardan yararlanılarak matris oluşturulmuştur.

Bulgular ve Tartışma: Kursa katılan Fen ve Teknoloji öğretmenlerinin ön ve son test puanlarında anlamlı bir farklılığın olduğu ($z=2.20$, $p<.05$), fark puanlarının sıra ortalaması ve toplamları dikkate alındığında, gözlenen farkın pozitif sıralar yani son test puanı lehinde olduğu analizler sonucunda anlaşılmıştır. HİE kursunun kursa katılan Fen ve Teknoloji öğretmenlerinin başarılarının artmasında anlamlı etkide bulunduğu ifade edilebilir. Öğretmenlerin ön test ve son testte verdikleri cevaplar incelendiğinde öğretmenlerin çoktan seçmeli soruları klasik sorulara göre daha kolay cevaplayabildikleri görülmektedir. Bu da daha çok bilgi ve kavrama düzeyi içeren çoktan seçmeli

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soruların birçoğu uygulama düzeyinde olan açık uçlu sorulara göre daha kolay cevaplanabilmesi ile ilişkilendirilebilir. Öğretmenlerin ön testte yer alan açık uçlu soruların çoğuna tam olarak cevap veremedikleri fakat son testte açık uçlu soruların büyük bir kısmının bütün öğretmenler tarafından doğru yapıldıkları söylenebilir. HİE kursunda yer alan ve öğretmenlerin bireysel geliştirmelerini sağlayan etkinliklerin bu gelişim üzerinde etkili olduğu düşünülebilir.

Hazırlanan HİE kursu tutum anketi ön ve son test olarak kursa katılan 6 Fen ve Teknoloji öğretmenine uygulanmıştır. Determinasyon katsayısı (r^2 =0,52) göz önüne alındığında HİE kursuna katılan Fen ve Teknoloji öğretmenlerinin tutumlarının değişmesinin % 52 oranında uygulanan hizmet içi eğitim kursundan kaynaklandığı görülmüştür. Öğretmenlerin tutumlarında meydana gelen bu değişim kurs ortamının öğretmen ihtiyaçlarını temel alan bir kurs programının düzenlenmesi ile ilişkilendirilebilir. HİE kursunun öğretmenlerin içinde bulundukları sıkıntıları giderebilecek bilgi, beceri sunduğu ve onlar için yeni olan birçok tekniğin tanıtımını içerdiğinden ilgilerini çekmesi ile kursa karşı tutumlarında pozitif yönde artışın olduğu düşünülebilir.

Öneriler: Bu çalışmada; yapılandırılmış grid, tanılayıcı dallanmış ağaç, performans değerlendirme ve portfolyo ile ilgili bir hizmet içi eğitim kursu düzenlenmiştir. Benzer şekilde diğer alternatif ölçme-değerlendirme tekniklerini içerisine alan hizmet içi eğitim kurs programları düzenlenebilir. Düzenlenen hizmet içi eğitim kurslarında teorik bilgilerden ziyade uygulamalı çalışmalara yer verilerek öğretmenlerin gelişimine katkıda bulunularak öğretmenlerin bu teknikleri kullanabilme becerilerine katkıda bulunulabilir. Ayrıca öğretmenlerin ihtiyaçları göz önünde bulundurularak hizmet içi eğitim düzenlenmeli ve bu sayede öğretmenlerin bu kurslara daha istekli katılmaları sağlanabilir.