The Evaluation of the Implementation Process of Science and Technology Course Curriculum in Elementary Education According to Teachers' Opinions

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Abstract: The aim of the current study is to evaluate the implementation process of the Science and Technology course curriculum based on teachers' opinions in schools with different socioeconomic status (SES). The sample of the current study includes Science and Technology teachers in elementary schools; two of them have high SES, two have middle SES, and two have low SES. These elementary schools were chosen from low- to middle and high SES elementary schools in central district of Sakarya via stratified sampling. The teachers' opinions about the competence of the implementation of the program were obtained by semi- structured interview. The obtained qualitative data was analyzed via content analysis. It was founded that the current program is superior to the old one according to teachers' opinions. However, several factors prevent the implementations of the program, such as insufficient time, insufficiency of materials, individual differences, the population density in some units, class crowding, unprepared students to lessons, placement test (special name is SBS in Turkey), and the process of preparation to exams city- wide, the inappropriateness of the activities to students' level, the unawareness of parents, the difficulty in the access to the sources for students who are not capable of.

Keywords: Science and technology course, curriculum, program evaluation, teachers' opinions.

Introduction

The programs that are used in Teaching- learning process are evaluated to understand the effectiveness of them; if they are not effective, to understand where the problem is derived from. The results of this evaluation serve as a resource to the process of later program development.

With the evaluation of the programs, several factors are supplied, such as making better decisions about the programs, developing better programs, the better use of curriculum (Stake, 1967). Especially, the analysis, and continuous evaluation of "the learning activities that are conducted in classes" elicit the rise of more realistic approaches in the evaluation of the system of education, and the curriculum (Fidan, 1997: 3).

The implementation of the curriculum of any lesson means the development of a teaching and learning process based on the rudiments of that program, and making use of this (Özçelik, 1987:4). The implementation of the curriculum is in the case of linear and straight stages, and occurs radially (Shawer, 2010). In addition, several factors can affect the implementation of the curriculum both positively, and negatively.

In the process of the implementation of the curriculum, important variables that give rise to the actualization of all learning processes take place in all components of the system of education. When the teaching and learning environment is arranged, those variables should be used in a way that fit for purpose because each variable can affect the outcomes of the system. In an education system, which brings students in pre- determined goals of the program, cues, corrections, feedback, and reinforcements should be used in the right place at the right time. Moreover, the equipments, time, and the organization of the classrooms should be arranged in a way that fits to the goals of the learning. Furthermore, the participation of the students to the learning process, the arrangement of the activities that improve the critical, and creative thinking of the students should be supplied with the help of appropriate teaching- learning strategies, methods, and techniques. All of those aforementioned suggestions should intertwine to each other (Sönmez, 2007). Those teaching- learning activities are actualized in stages as preparation (attention getting, motivation, revision), presentation (passing to the lesson, and development), application (individual and group learning activities), and with the implementation of curriculum in stages of application, summation- evaluation, that is in the course of teaching lesson (Akbaşlı, 2011).

Teacher factor comes first among possible factors that affect the implementation of the curriculum because the meaning that teachers give to new curriculum functions as a map in the implementation process of

the curriculum, and this situation indicates the success of the curriculum. Teachers are key factors in the success of new curriculum. The knowledge, beliefs, and understandings of the teachers play a crucial role in understanding new curriculum. Teachers use their daily knowledge and experiences to make sense of new curriculum process, and this affect and shape the meaning that is given by teachers to new curriculum. The understanding and the acceptance of teachers about the new curriculum process have an impact on the implementation of the curriculum (Bantwini, 2010). Spears (1950) stated that to an effective curriculum it should not be forgotten that the curriculum lies in the heart and mind of the teacher (Varış, 1988: 17). Those are teachers, who transform the curriculum from institutional to educational (Shawer, 2010).

In today's world, curriculums are based on constructivist approach, which provide more roles to teachers. It is expected that teachers should be in the center of teaching- learning process, encourage, and guide students. Teaching- learning process should be undergone with activities, experiments, projects, which are conducted with students, because Science and Technology course is learned with doing and experiencing. That is the purpose of the curriculum. Therefore, teachers should apply stuffs that are foreseen in the curriculum in classroom settings.

According to researches, the approach of teachers to the curriculum has significant effects on both their occupational development, students' learning, and in encouraging them to learning (Shawer, 2010).

Depending on aforementioned factors, the purpose of the current study is to determine how teachers implement the curriculum of Science and Technology course, and what they encounter with while implementing it.

Method

Research Method

In the current study, qualitative research method was used.

Population and Sample

The sample of the current study includes Science and Technology teachers in elementary schools; two of them have high SES, two have middle SES, and two have low SES. These elementary schools were chosen from low- to middle and high SES elementary schools in central district of Sakarya via stratified sampling.

Data Collection

In the current study, the interview form that was designed to measure the general views of Science and Technology teachers about the applicability of the foreseen factors in the curriculum of 6th grade Science and Technology course was used. This interview measures not only the opinions of the teachers but also do measure the attitudes and judgments of them toward the curriculum.

Before the preparation of the interview form, the literature was reviewed, and open-ended questions that best describe the sub-problems were written. For the Content validity of the interview, it was consulted to the opinions of the Science and Technology field experts (n=3), teachers (n=5), and program development experts (n=7). The form of the questions was revised based on the feedbacks of experts. Revised version was broached to same experts again. After taking the expert approval, the interview form was filled out by Science and Technology teachers other than research sample (n=3) to test the functionality and the clarity of the questions. Then structured interview was applied to sample.

Interviews were carried out at times that were suitable for the teachers' schedule. In order to prevent data loss, recorder was used during interviews with taking the permission of the teachers, and the interviews lasted approximately 25-35 minutes.

Analysis of Data

Data that was obtained by interview form was analyzed with content analysis. For the content analysis, firstly, data was recorded to a recorder, and then was transformed into a written material. The written materials were examined repeatedly, and data that was appropriate for the purpose of the study were codified. Then categories (themes) that described codified data generally were determined. Those findings were organized as tables. Teachers, participating in interview, were coded as G1, G2, G3, G4, G5, and G6. In the evaluation process of the findings, direct quotations about opinions of teachers were used.

Result and Discussion

Data that was obtained through interviews with teachers was coded in accordance with determined categories, and was presented as tables.

- Teachers' Opinions About Preparation Of The Learning Environment That Fits the Gains

  Themes that are effective in the preparation of the learning environment, which fits to the gains, according to teachers' opinions, and the codes are represented in Table 1.

Table 1. Teachers' opinions about preparation of the learning environment that fits the gains

Teacher	School SES	Themes (categories)		
		Preparation Situation	**Positive Effect**	**Negative Effect**
G1	High	I try to prepare a suitable learning environment with respect to the potential of the school	Utilization of the guidance book	Unprepared students come to classes Insufficiency of materials Insufficiency in the technological condition of the school
G2	High	I prepare learning environment that fits most of the gains	Utilization of the guidance book Utilization of the computer and the projector	Insufficiency of materials Students' levels are low
G3	Middle	I try to prepare a suitable learning environment with respect to the potential of the school	-	Unprepared students come to classes
G4	Low	I cannot prepare a learning environment that fits to every gain	Utilization of the guidance book	Insufficiency of materials Crowded classes Insufficiency in time Density in the program
G5	High	I prepare learning environment that fits most of the gains	Utilization of the guidance book Having a laboratory Utilization of the computer and the projector	Crowded classes Insufficiency in time Density in the program The early application of the SBS
G6	Middle	I cannot prepare a learning environment that fits to every gain	-	Unprepared students come to classes Insufficiency in materials

As represented in Table 1, opinions of teachers were gathered into three categories, namely "Preparation Situation," "Positive Effect," and "Negative Effect." When teachers' situations about preparing a learning environment that fits to gains were investigated, it was founded that two teachers prepare learning environment that fits to most of the gains, two of them try to prepare learning environment according to the potential of the school, and two of them cannot prepare learning environment that fits to every gains. Direct quotations that were gotten from teachers' opinions are as follows:

"It differs according to the situation of the school… gains are useful but it is not possible to apply all of them. (G1)

"I have the edge on this situation because there is a laboratory, computer, and projector in the school. I can provide visuality to students by using them. I think that I cannot provide all the gains but I can do most of them..." (G5)

When teachers' opinions about the negative effect of preparing a learning environment were investigated, it was founded that four of them mentioned the insufficiency of the materials; three of them mentioned students' unpreparedness; two of them mentioned the crowdedness of the classes, insufficiency in time, density in the program; one of them mentioned the insufficiency in the technological condition of the school; one of them mentioned the low level of students' capacity, and one of them mentioned the early application of SBS exam in Turkey. Direct quotations that were gotten from teachers' opinions are as follows:

"… because of the crowdedness of the classes, insufficiency in the materials of laboratory, we cannot do experiments, so we cannot give every gain to students. In addition to these, there is a problem in time management; the subjects of 7th grade cannot be finished. It is important to learn Science and Technology course with seeing, and doing, but we cannot fulfill it..." (G4)

- Teachers' Opinions About The Improvement In Students' Learning Desires

What teachers do at the beginning of the classes to increase the desires of students' in terms of learning in the process of teaching- learning was shown in Table 2.

Table 2. Teachers' Opinions About The Improvement In Students' Learning Desires

Teachers	**School SES**	**Themes (categories)**	
		Example	**Question**
G1	Low	I give examples from daily life I give examples from news in TV programs and news in the media	-
G2	High	I give examples from daily life I use pictures at the beginning of the units	I test the knowledge of students that they learned at 4th and 5th grades
G3	Middle	I give examples from daily life	I test the knowledge of students that they learned at 4th and 5th grades
G4	Low	I give examples from daily life	I begin classes with asking questions
G5	High	I give examples from daily life I begin classes with a suitable object to the subject	I test the knowledge of students that they learned at 4th and 5th grades
G6	Middle	I give examples from daily life I give examples from news in TV programs and news in the media	I begin classes with asking questions

As shown in Table 2, the opinions of teachers were gathered into two categories, namely "example," and "question." When opinions of teachers who want to choose giving examples to increase students' desires were investigated, all of the teachers stated that they give examples from daily life. Direct quotations that were gotten from teachers' opinions are as follows:

"By giving examples from daily life, I try to draw students' attention to the subject…" (G4)

"It could be an object that draws attention to the subject… I try to capture their attention by giving examples from daily life because the lesson is about the real life…" (G5)

When opinions of teachers who want to chose questions to increase students' desires were investigated, three of the teachers begin classes with testing students' knowledge that they learned at 4th and 5th grades, two of them begin classes with asking questions to capture attention. Direct quotations that were gotten from teachers' opinions are as follows:

"… I begin classes with question and answer section to draw attention of the students… "(G4)

"… The method that I use mostly is asking questions about daily life… for example, in order to explain the movement of the Earth and the Moon, I ask that "did you see the Moon last night?","how it looked like?" Thus, I can draw their attention… (G6)

- Teachers' Opinions About The Implementation Of The Activities That Fit To The Gains

Teachers' opinions about the implementation of the activities that fit to the gains in the teaching-learning process was shown in Table 3.

Table 3. Teachers' opinions about the implementation of the activities that fit to the gains

Teacher	School SES	Themes (categories)	
		Planning, presenting, and creating activities	**Application time, place, and opportunities**
G1	Low	-	I cannot apply because there is no laboratory and materials
G2	High	I try to apply two out of three activities in the guidance book I want students to bring materials for some activities I get students to watch activities that we cannot do in class on the internet	-
G3	Middle	We cannot apply all the activities I give homework to students about activities that we cannot do in class. I get students to watch activities that we cannot do in class on the internet	I have trouble in terms of timing The capacity and the readiness of the students affect the application of the activities
G4	Low	I sometimes do activities	I have trouble in terms of timing The crowdedness of the class prevents the application of the activities I do not get students to do activities because it is dangerous
G5	High	I try to apply two out of three activities in the guidance book I want students to bring materials for some activities I give homework to students about activities that we cannot do in class If I find different activities, I try to do them also. I do some activities myself and students watch me.	I have trouble in terms of timing The crowdedness of the class prevents the application of the activities
G6	Middle	I want students to bring materials for some activities	I cannot apply because there is no laboratory and materials

As shown in Table 3, teachers' opinions were gathered into two categories, namely "Planning, Presenting, And Creating the Activities," and "Application Time, Place, and Opportunities."

When teachers' opinions about the planning, presenting, and creating the activities category was investigated, it was founded that three of them reflected that they want students to bring materials, two of them stated that they try to do two out of three activities in the guidance book, two of them reflected that they get students to watch the activities that they cannot do in class, on the internet, two of them reflected that they give homework to students about activities that they cannot do in class, one of them pointed out that he does activities sometimes, and one of them declared that he tries to do different activities, and he does some activities himself and gets students to watch him. Direct quotations that were gotten from teachers' opinions are as follows:

"I cannot do all activities. I give homework to students about activities that we cannot do in class or I get students to watch them on Vitamin program on internet…" (G3)

"… I want students to bring some materials from their home and we try to do activities with them as much as possible …" (G6)

When teachers' opinions about the application time, place, and opportunities of the activities category was investigated, it was founded that three of them stated that they have troubles in terms of timing, two of them stated that the crowdedness of the classes prevent the application of the activities, two of them stated that they cannot do activities because there is no laboratory and materials, one of them stated that the capacity and the readiness of the students affect the application of the activities, and one of them stated that she does not get students to do activities because it is dangerous. Direct quotations that were gotten from teachers' opinions are as follows:

"The activities cannot be done because of the school's conditions, like lack of laboratory and insufficiency in materials." (G1)

"If we try to do activities, we have trouble in timing. All activities that are mentioned in the program can surpass students' capacity. Students' readiness affects the application of the activities." (G3)

Researches show that teachers adopt the activities largely, and they try to do them (Doğan, 2009), but the high number of activities (Sert, 2008) and the lack of time make them have trouble in the application process (Wood, 2001; Sert, 2008; Tekbıyık ve Akdeniz, 2008). Moreover, only a few number of teachers do activities about subject in class (Akdeniz, Yiğit ve Kurt, 2002), and the program is not fulfilled as foreseen and enough (Gözütok, Akgün ve Karacaoğlu, 2005; Kurtuluş ve Çavdar, 2011). Besides, teachers have trouble in using local opportunities, organizing excursions, and doing research about immediate surroundings in the application of activities (EARGED, 2006). Similarly, teachers stated that they can do one experiment in a week because of the conditions of classes, they give activities as homework (Kesercioğlu, Türkoğuz, Kılınç ve Toprak, 2006), and the lack of experiments in the application of the curriculum (Wood, 2001).

- Teachers' Opinions About The Methods And Techniques That They Use In The Learning Process

Teachers' opinions about which methods and techniques they use mostly in the teaching- learning process were shown in Table 4.

Table 4. Teachers' Opinions About The Methods And Techniques That They Use In The Learning Process

Teachers	**School SES**	**Themes (categories)**	
		Teacher- centered	**Student- centered**
G1	Low	Question- answer teaching method	Brainstorming
G2	High	Formal lecture method Question- answer teaching method Demonstration	Discussion Brainstorming Six thinking hats Drama
G3	Middle	Question- answer teaching method Demonstration	Discussion Group work
G4	Low	Question- answer teaching method	Discussion Brainstorming
G5	High	Formal lectures Question- answer teaching method Demonstration	Observation
G6	Middle	Question- answer teaching method	Drama

As demonstrated in Table 4, teachers' opinions were gathered into two categories, namely "Teacher-centered," and "Student- centered."

When the opinions of teachers that use the teacher- centered approach were investigated, it was founded that all of them use mostly question- answer method, three of them use demonstration method, and two of them use formal lectures. Direct quotations that were gotten from teachers' opinions are as follows:

"I use firstly the formal lectures, I use mostly the question- answer, I give examples from daily life, and I use visual materials…" (G2)

"The method that I use mostly is question- answer …" (G6)

When the opinions of teachers that use the student- centered approach were investigated, it was founded that three of them use discussion method, three of them use brainstorming, two of them use drama, one of them uses six thinking hats, one of them uses observation, and one of them uses group work technique. Direct quotations that were gotten from teachers' opinions are as follows:

"… I sometimes use brainstorming and discussion. This change depends on the subject." (G4)

"… I use drama to show the atom models, the movement of the gases, liquids, and solids…" (G6)

Studies indicate that in the teaching process, the applicability of methods and techniques that foreseen in the curriculum in the class settings is not sufficient. Besides, the student- centered method is not common (Bayrak ve Erden, 2007), and it is not possible to use different teaching methods because of the crowdedness of classes (Erdoğan, 2007). Most of the teachers teach according to teacher- centered approach (Akdeniz, Yiğit ve Kurt, 2002; Yıldırım, 2011), and they use mostly the brainstorming, discussion, question- answer, group work, expression, and examples. On the contrary, they occasionally use problem solving, role playing, drama, demonstration, game method (Şahin, Turan ve Apak, 2005). Moreover, they focus on cooperative teaching (Özdemir, 2006), question- answer formal lectures (Özdemir, 2006; Güneş, Şener-Dilek, Hoplan ve Güneş, 2012). On the other hand, they seldom use laboratory, demonstration, experiment, travel- observation, analogy, projects (İzci, Özden ve Tekin, 2006).

- Teachers' Opinions About The Creation Of Democratic Learning Environment

When teachers' opinions about what they do for the creation of democratic learning environment was investigated, G6 teacher that work at a school with middle SES, stated that it is hard to create a democratic learning environment in class. G4 teacher, who work in a school with low SES indicated that the intergroup communication of students is low because of the lack of group works. Direct quotations that were gotten from teachers' opinions are as follows:

"It is difficult to create a democratic learning environment in classes because there are active students as well as passive ones…" (G6)

"… I cannot get students do group work, so that the interaction within students is not well enough…" (G4)

Factors that are important in terms of the creation of democratic learning environment according to teachers' opinions were demonstrated in Table 5.

Table 5. Teachers' opinions about the creation of democratic learning environment

Teachers	**School SES**	**Themes (categories)**			
		Encouragement	**Respect**	**Giving opportunity to speak**	**Trust**
G1	Low	-	I give importance to students' respect to each other	I try to give equal opportunity to speak to each student	-
G2	High	-	-	I try to give opportunity to speak to all students	I try to call students by their first name to make them trust themselves
G3	Middle	I encourage students to express their opinions clearly	-	-	-
G4	Low	I try to make students, who are passive and timid, involve in discussion by asking questions	-	-	-
G5	High	I tell students that they can ask questions about everything	I give importance to students' respect to each other	-	-
G6	Middle	-	-	I try to give equal opportunity to speak to each student	-

According to Table 5, teachers' opinions were gathered in four categories, namely "Encouragement," "Respect", "Giving Opportunity to Speak," and "Trust."

When teachers' opinions about the category of encouragement were investigated, it was founded that one of them encourages students to explain their ideas clearly, one of them tells students to ask questions about everything, one of them tries to get passive students participate to lesson with asking questions. Direct quotations that were gotten from teachers' opinions are as follows:

"… I try to encourage students to participate in class. I try to get them participate in class. When they give wrong answers I say "maybe, we think in detail," instead of "it is wrong" to make them explain their ideas without hesitation. Thus, I try to create a democratic learning environment…" (G3)

When teachers' opinions in the category of respect were investigated, it was founded that two of them give importance to make students respect for each other. Direct quotations that were gotten from teachers' opinions are as follows:

"When students share their opinions, I give importance to make others not tease. I try to give awareness to students about this issue…" (G1)

When teachers' opinions about giving opportunity to speak were investigated, it was founded that two of them try to give equal opportunity to every students, one of them tries to give opportunity to speak to every student. Direct quotations that were gotten from teachers' opinions are as follows:

"I give opportunity to speak to every student." (G1)

"… I try to give equal opportunity to speak to students as far as in me lies..." (G6)

When teachers' opinions about the category of trust were investigated, it was founded that G2 teacher that work at a school with high SES uses students' first names to make them believe in themselves.

Gözütok, Akgün and Karacaoğlu (2005) stated that teachers do not give importance to students' opinions, and there is no positive democratic learning environment in classes.

- Teachers' Opinions About Alternative Testing And Measurement Methods

Teachers' opinions about alternative testing and measurement methods in teaching- learning process were demonstrated in Table 6.

Table 6. Teachers' opinions about alternative testing and measurement methods

Teachers	**School SES**	**Themes (categories)**	
		Alternative methods and their drawbacks	**Classic methods**
G1	Low	I do not use alternative testing and measurement methods Scales place a burden because there is too much work related to photocopy	In exams, I prepare multiple choice, short essays, true false, and fill in the blanks questions. In class, I do verbal exam in question and answer format
G2	High	I do not prefer to use alternative testing and measurement methods that foreseen in the curriculum Volunteer students prepare product file I give performance grade (final grade) according to students' participation in classes Extra time is needed to use scales	In exams, I prepare multiple choice, short essays, true- false, matching fill in the blank questions I prefer mostly multiple choice questions because we prepare students to SBS exam
G3	Middle	I do not prefer to use alternative testing and measurement methods that foreseen in the curriculum Volunteer students prepare product file I give performance grade (final grade) according to students' participation in classes Scales place a burden because there is too much work related to photocopy	In exams, I prepare multiple choice, short essays, true- false, matching fill in the blank questions
G4	Low	I give projects to volunteer students I give performance projects to students about subjects that they can do research	In exams, I prepare multiple choice, short essays, true- false, matching fill in the blank questions
G5	High	I do not prefer to use alternative testing and measurement methods that foreseen in the curriculum I give projects to volunteer students Extra time is needed to use scales	In exams, I prepare multiple choice, short essays, true- false, matching fill in the blank questions
G6	Middle	I do not prefer to use alternative testing and measurement methods that foreseen in the curriculum I give projects to volunteer students I give performance grade (final grade) according to students' participation in classes Students determine their project subject Extra time is needed to use scales Scales place a burden because there is too much work related to photocopy	In exams, I prepare multiple choice, short essays, true- false, matching fill in the blank questions

According to Table 6, teachers' opinions were gathered into two categories namely, "Alternative Methods, and Their Drawbacks," and "Classic Methods."

When teachers' opinion about the category of alternative methods and their drawbacks were investigated, it was founded that four of them do not prefer to use alternative testing and measurement methods that foreseen in curriculum, three of them give performance note (final grade) to students according to their participation in class, there of them give projects to volunteer students, three of them stated that extra time is needed to use scales, three of them indicated that scales place a burden because there is too much work related to photocopy, two of them mentioned that volunteer students prepare product file, one of them does not use alternative testing and measurement methods, one of them gives projects and performance home works seldom, one of them stated that students determine their own project subject, one of them gives performance home works that enable students to do research. Direct quotations that were gotten from teachers' opinions are as follows:

"Scales that are foreseen in the guidance book do not allow us to teach a lesson. So I do not use that scales." (G1)

"… I give projects to volunteer students as term paper. They chose their own subject themselves after I determine possible subjects. I give performance homework that enables them to do research…" (G4)

When teachers' opinions about classic methods were investigated, it was founded that all teachers prepare multiple choice, short essays, true- false, matching, fill in the blank questions in exams. One of them does verbal exam in class as question- answer format. One of them prefers multiple-choice questions because we prepare students to SBS. Direct quotations that were gotten from teachers' opinions are as follows:

"I try to prepare exam questions in accordance with curriculum. I use multiple- choice, fill in the blank, short essays questions in exams, but not the scales that are foreseen because there is too much photocopy work there, which brings extra burden. Thus, I evaluate students with my own exams…" (G3)

"…My exam questions are multifarious. Indeed, they include true- false, fill in the blank, multiple-choice question…" (G5)

Researches show that teachers pointed out about the evaluation of the curriculum that evaluation examples foreseen in the curriculum is necessary but they are not sure about the applicability of it (Bayrak ve Erden, 2007), even they do not apply it (Kurtuluş ve Çavdar, 2011). Similarly, they stated that the testing and measurement is not done enough because there is too much evaluation methods (Gündoğar, 2006; Sert, 2008), they are too complicated (Ersoy, 2008; ERAGED, 2006; Selvi, 2006), and they place a burden to teachers (Aydın ve Çakıroğlu, 2010; Özdemir, 2007), and there are some problems related to its implementation (Ayvacı ve Devecioğlu, 2009; Kurtuluş ve Çavdar, 2011; Bantwini, 2010). Moreover, they indicated that they have problems in terms of the implementation of the testing and measurement methods (Ayvacı ve Devecioğlu, 2009), and they consider themselves as inadequate in this issue (Gözütok, Akgün ve Karacaoğlu, 2005). Doğan (2009) founded that teachers who work in schools with high SES are more likely to use testing and measurement methods.

- Teachers' Opinions About The Implementation Of Science And Technology Curriculum

Teachers' opinions about the implementation of the Science and Technology curriculum in teaching-learning process were shown in Table 7.

Table 7. Teachers' opinions about the implementation of the Science and Technology curriculum

Teachers	School SES	Themes (categories)		
		Application situation	**Factors making application easier**	**Factors making application difficult**
G1	Low	I think that I do not apply	-	The potentials of the school is not suitable Parents' unconcernedness and their economical problems are disadvantages
G2	High	I apply	In the application process, I use teacher guidance book	The insufficiency in materials is a problem The preparation to SBS exam affects the application of the program
G3	Middle	I think that I apply in terms of approach	In the application process, I use teacher guidance book	-
G4	Low	I think that I do not apply	-	The crowdedness of the classes affect the application The laboratory is not available The potentials of the school are not enough
G5	High	I think I apply by 80%	The student exercise books make it easier to apply the program	The crowdedness of the classes affect the application The preparation to SBS exam affects the application of the program
G6	Middle	In think that I apply in terms of approach	-	The laboratory is not available The insufficiency in materials is a problem

According to Table 7, teachers' opinions were gathered into three categories, namely "Application Situation," "Factors Making Application Easier," "Factors Making Application Difficult."

When teachers' opinions in the category of application situation were investigated, it was founded that two of them do not think they apply the program, two of them think they apply in terms of approach, one of them applies, one of them thinks he applies by 80%. G1 and G4 who think that they do not apply the program work at schools with low SES. Direct quotations that were gotten from teachers' opinions are as follows:

"… There are several factors that affect the application of the curriculum… it is not only about the teacher… I do not think that I apply…" (G1)

"I think I apply by 80%" (G5)

When teachers' opinions about the category of factors making application easier were investigated, it was founded that two of them use teacher guidance book in the application process of the program, one of them considers student exercise books as useful in terms of the application of the program. Direct quotations that were gotten from teachers' opinions are as follows:

"I apply the program on the basis of guidance book …" (G2)

"I follow the guidance book in the application process…" (G3)

When teachers' opinions about the category of factors making application difficult were investigated, it was founded that two of them stated that the potentials of the school are not enough, two of them consider material insufficiency as a problem, two of them see laboratory as unavailable, two of them consider the crowdedness of the classes as a problem, two of them stated that the preparation process to SBS affects the application, and one of them considers the unconcernedness and economical problems of the parents as problems. Direct quotations that were gotten from teachers' opinions are as follows:

"… This problem is specific to our school, if we had a laboratory, materials, or a Science and Technology class, I would be able to apply the program better …" (G6)

- Teachers' Opinions About The Positive And Negative Aspects In The Application Process Of The Program

Teachers' opinions about the positive and negative aspects in the application process of the program were shown in Table 8.

Table 8. Teachers' opinions about the positive and negative aspects in the application process of the program

Teachers	School SES	Themes (categories)	
		Positive	**Negative**
G1	Low	It is better to be student- centered It is superior to the old curriculum	The time is not sufficient Exam subjects are not taken place Subjects are very superficial
G2	High	I think that positive aspects are more than negative ones In general, the program is better, it can be applied I am satisfied with the program It is better than the old one It is suitable for student level It is suitable for schools	Material insufficiency is a problem Time is not sufficient Some units are very extensive Individual differences create problems
G3	Middle	It is better to be student- centered Being superficial of the subjects prevent students to be bored It encourage students to think and research Being spiral of the program is good	Time is not sufficient Activities foreseen in the program are too much for students' capacity
G4	Low	I think that it has positive aspects as compared to the old one	Material insufficiency is a problem Time is not sufficient Individual differences create problems The crowdedness of the classes is a problem Students' unpreparedness for lessons is a problem SBS and the exams city- wide are problems Parents do not have awareness It is difficult for some students to reach resources
G5	High	I am satisfied with the program It is better than the old one It is more current than the old one	Some units are extensive The crowdedness of the classes is a problem SBS exam and other exams city-wide are problems
G6	Middle	I think positive aspects are more than negative ones It is better than the old one It is suitable for student level It is more current than the old one Being spiral of the program is good Students are more likely to love Science and Technology lesson compared to the past	The material insufficiency is a problem Time is insufficient Students' unpreparedness for classes is a problem

As shown in Table 8, teachers' opinions were gathered into two categories, namely "Positive," and "Negative."

When teachers' opinions in the category of positive aspect were investigated, it was founded that four of them consider the curriculum better than the old one, two of them stated that being student- centered is well, two of them pointed out that positive aspects are more than the negative ones, two of them are satisfied with the program, two of them consider the program as appropriate for student level, two of them consider being spiral as a good thing, two of them stated that new program is more current than the old one, one of them stated that the

program is better, it can be applied, one of them mentioned that being superficial prevent students to be bored, and make students think and research, and one of them stated that students are more likely to love Science and Technology course compared to the past. Direct quotations that were gotten from teachers' opinions are as follows:

"… In terms of positive aspects, it is better than the old one by %80-%90. Being student- centered, activities, different teaching methods are good…" (G1)

"… The program has positive aspects as compared to the old one but…" (G4)

"… Program is better than the old one. I am satisfied with the program. Its intensity is decreased compared to the past. The old program based upon the formulas, problem- solving. Now, it based upon commentary, observation, and it is more current…" (G5)

Teachers' opinions about positive aspects of the curriculum are supported by researches. Researches indicated that teachers' opinions about the curriculum focus on the easiness of its applicability (Probart, McDonnell, Achterberg ve Anger, 1997), its application in the current circumstances (Dellalbaşı, 2010), its being spiral (Ayvacı ve Devecioğlu, 2009; Sert, 2008). The subject intensity decreased (Ercan ve Akbaba-Altun, 2005). Thus, teachers are satisfied with the program. In terms of student perspective, it was founded that program is student-centered (Tüysüz ve Aydın, 2009; Aydın ve Çakıroğlu, 2010), it is appropriate for student level (Dellalbaşı, 2010; Ayvacı ve Devecioğlu, 2009; Tüysüz ve Aydın, 2009), it is current and has an interaction to real life (Tekbıyık ve Akdeniz, 2008; Ayvacı ve Devecioğlu, 2009), it allows students to learn with doing, experiencing, thinking (Sert, 2008; Yıldırım ve Dönmez, 2008), it encourages students to do research and think critically (Çınar, Teyfur ve Teyfur, 2006; Selvi, 2006), it is interesting and attention getting (Tekbıyık ve Akdeniz, 2008; Kurtuluş ve Çavdar, 2011). Hence, students are more likely to love Science and Technology course now.

When teachers' opinions about negative aspects of the curriculum were investigated, it was founded that five of them stated that time is insufficient, two of them stated that materials are insufficient, two of them consider individual differences as problem, two of them consider some units as intensive, two of them see crowdedness of the classes as problem, two of them regard student' unpreparedness as problem, two of them consider the preparation process in SBS exam and city-wide exams as problems, one of them stated that in the curriculum exam subjects do not take place, and subjects are very superficial, one of them mentioned that activities in the curriculum surpass students' capacity, one of them stated that parents do not have awareness, and finally it is difficult to reach sources for students who are not capable of. Direct quotations that were gotten from teachers' opinions are as follows:

"In terms of negative aspects, time is not sufficient for all activities. Formal lecture, answering questions, and experiments cannot be finished in a 4 hour- period. Topics are too much disjointed, and they cannot be put together… in terms of subjects, there is not enough details. Exam subjects do not take place in the course book. There is no summary section in the course book. The important aspects about subjects do not take place in the course book. Subjects are too superficial…" (G1)

"…In terms of negative aspects, if we tried to do all activities we would be in trouble in terms of time. In addition, doing all activities in the curriculum surpass students' level." (G3)

Teachers' opinions about negative aspects of the curriculum are supported by researches. Studies show that time is not enough in terms of doing activities, and using testing and measurement techniques foreseen in the curriculum (Doğan, 2009; Yıldırım ve Dönmez, 2008; Sert, 2008; Erdoğan, 2007; Bantwini, 2010; Güneş, Şener-Dilek, Hoplan ve Güneş, 2012). The curriculum cannot be implemented because of material, equipment insufficiencies in schools (Tekbıyık ve Akdeniz, 2008; Ayvacı ve Devecioğlu, 2009; Aydın ve Çakıroğlu, 2010; Kurtuluş ve Çavdar, 2011). Moreover, the classes are too crowded (Doğan, 2009; Tüysüz ve Aydın, 2009; Adıgüzel, 2009; Bantwini, 2010; Ersoy, 2008; Delllbaşı, 2010; Okur, 2008), the content is too intensive, the number of activities, and gains are too much (Güneş, Şener-Dilek, Hoplan ve Güneş, 2012; Tekbıyık ve Akdeniz, 2008; Sert, 2008). The content is too superficial (Sert, 2008; Güneş, Şener-Dilek, Hoplan ve Güneş, 2012), the subjects surpass students' level (Ayvacı ve Devecioğlu, 2009¸ Güneş, Şener-Dilek, Hoplan ve Güneş, 2012), the content is not balanced with the exams in city- wide (Karaer, 2006; Sert, 2008).

If negative aspects in terms of students are considered, students tend to study in accordance with SBS exam (Özden ve Tekin, 2006); they do not do projects and performance home works (Özdemir, 2007; Dellalbaşı, 2010). Furthermore, projects surpass students' levels (Tabak, 2007), and students cannot do activities that aim to process knowledge (Adıgüzel, 2009).

Negative aspects of the curriculum in terms of parents are as follows: parents' teaching perspective focus on SBS, and they cannot change their habits (Aydın ve Çakıroğlu 2010). Parents do not have awareness and attention (Adıgüzel, 2009; Doğan, 2009; Bantwini 2010), their SES are low (Aydın ve Çakıroğlu, 2010; Özdemir, 2007). Thus, they cannot add too much thing to their children.

Besides to aforementioned factors, studies indicated that substructure, equipments, and opportunities in schools are not enough (Erdoğan, 2007; Yıldırım ve Dönmez, 2008; Ercan, 2007). Similarly, the physical conditions of classes are not suitable (Tekbıyık ve Akdeniz, 2008; Doğan, 2009; Güneş, Şener-Dilek, Hoplan ve

Güneş, 2012), the school environments are negative (Hardal-Ateş ve Aşçı-Akdağ, 2006; Bağdatlı, 2005). The teaching environment is insufficient for student- centered applications (Bulut, 2008; Erdoğan, 2007); there is insufficiency in laboratories in schools (Tabak, 2007; İzci, Özden ve Tekin, 2006; Kesercioğlu, Türkoğuz, Kılınç ve Toprak, 2006). Moreover, new methods and techniques cannot be used (Gündoğar, 2006; Bantwini, 2010), students' active participation cannot be achieved (Tekbıyık ve Akdeniz, 2008; Tabak, 2007), activities cannot be implemented (Kurtuluş ve Çavdar, 2011; Wood, 2001). Besides, some activities are under the level of students (Aydın ve Çakıroğlu, 2010; Kurtuluş ve Çavdar, 2011).

Conclusion and Suggestions

In general, it is obvious that teachers cannot implement the curriculum of Science and Technology course in classes. In order to compensate shortcomings in the application process, followings are suggested:

1. There should be some amendment in the physical conditions of schools and classes. By focusing on SES factor, teachers should determine insufficiencies in their own classes, and those should be compensated.
2. Materials that are needed for the application of activities foreseen in the curriculum should be gathered, and should be supplied to each school in the form of boxes. Those boxes should be gathered according to class, units, and subjects and they should be enough for the whole semester.
3. Teaching seminars should be organized during the semester in accordance with teachers' desires, demands, and opinions about the implementation of the curriculum.
4. For the application based Science and Technology course, the elements of the curriculum should be revised and its intensity should be minimized.
5. Duration of lessons should be revised and time management problem should be solved. The duration may be divided into three categories, namely course hour, activity hour, testing and measurement hour, which is similar to reading hour, guidance hour in schools.

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