

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

Procedia Social and Behavioral Sciences 15 (2011) 1092–1096

---

---

**Procedia**  
Social and Behavioral Sciences

---

---

WCES-2011

## The using levels of the teaching methods and techniques by teachers

Tohit Güneş<sup>a\*</sup>, Nilay Şener Dilek<sup>a</sup>, Murat Çelikoğlu<sup>a</sup>, Engin Serdar Demir<sup>a</sup><sup>a</sup>*Ondokuz Mayıs University Faculty of Education Department of Elementary Education, Samsun, Turkey*

---

### Abstract

This study aims to determine the teaching strategies, methods and techniques teachers use in Science and Technology classes and what they lack in this issue. 95 teachers, 45 of whom are science teachers and 50 of whom are primary school teachers, were subjected to a survey, and 33 teachers were interviewed orally. It was revealed that the teachers don't have sufficient knowledge about teaching strategies, methods and techniques and that they can't distinguish between these concepts. It was seen that the teachers use explanation and question-answer methods more often even though they know that the best technique is the experiment technique and they seldom get their students to carry out experiments. It was concluded that the teachers who don't exploit various methods despite knowing their advantages need in-service trainings.

© 2011 Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](http://creativecommons.org/licenses/by-nc-nd/3.0/).

*Keywords: Teaching methods; strategy; technique, science education.*

---

### 1. Introduction

The fact that, using information is important to produce science and technology and that this has become such that it is incredibly affecting our lives requires a qualified science education. Regardless of their cultural and individual differences, training students as science and technology literates constitutes the objective of Science and Technology Program, which is implemented in this era of knowledge and technology (MoNE – Ministry of National Education- 2005). As the implementer of the program, teachers must include their students actively in the process by using various teaching strategies, methods and techniques in order to achieve the objectives of the lesson.

Considering the fact that students have distinct cognitive, sensorial and psychomotor features, teachers use the most suitable teaching techniques and methods accordingly. However, Erdem et al. (2006) stated in their comprehensive study that teachers don't find themselves competent enough to exploit various teaching methods. Science classes shouldn't be carried out as if it were an encyclopedia containing various concepts and rules. Science is a lesson that must be learned by discovery. The preferences of teachers employed in primary schools in teaching

---

\* Tohit Güneş, GSM: 05323476144  
E-mail: [tohitg@omu.edu.tr](mailto:tohitg@omu.edu.tr)

Methods and techniques suitable for the objectives, the contents and situation of the lessons will increase students' interest, success and attendance in lessons (Şahin, 2004). If these lessons are provided as information collections, students won't feel confident enough to carry out their own researches and present them; as a result they will lack self-confidence, which will get their abilities limited (Trumbull et al., 2005; akt. Tatar and Kuru, 2006).

In the studies having been carried out before, it is outstanding that teachers in science and technology classes use teaching strategies, methods and techniques such as explanation and question-answer through presentation; they less often prefer teaching strategies, methods and techniques like discovery, laboratory, drama, experimentation, expedition-observation, or they never use them (Demirezen, 2001; Binler, 2007; Aktepe and Aktepe 2009). For this reason, this study aims to determine which teaching strategies, methods and techniques science and primary school teachers' use in Science and Technology classes and what they lack in this issue.

## 2. Method

The study was carried out with the participation of 45 science teachers and 50 primary school teachers employed in the primary schools in the city centre of Samsun. All the teachers were subjected to a likert type survey composed of 42 items and the data were analyzed by means of SPSS 18 package program. Also, semi-constructed oral interviews were carried out with 33 teachers 22 science teachers and 11 primary school teachers to support the collected data.

## 3. Results

### 3.1. The findings obtained from the results of the survey subjected to science teachers and primary school teachers

Nearly half of the science and primary school teachers stated that they often use inquiry based learning strategies through presentation and that they sometimes use discovery based learning strategies. %56,8 of the science and primary school teachers stated that they sometimes use project based learning, %41,1 use multiple intelligence, %43,2 use problem based learning, %32,6 use constructivist, %35,8 use cooperative and %32,6 use computer based teaching approaches more often. While %42,1 of the science and primary school teachers stated that they use narration, %43,2 use problem solving, almost half of them use discussion, question-answer, demonstration methods often, %41,1 sometimes use laboratory, %64,2 sometimes use expedition-observation methods (Table 1). %44 of the science and primary school teachers use brain storming and group discussion, %38,9 use group working techniques often while almost half of them sometimes use drama, acrostics, herringbone pattern, completing the story and six thinking hats (Table 1).

Table 1. The frequency of teaching strategies, methods and techniques science and primary school teachers use in science and technology lessons

Teaching Strategies, Methods and Techniques	Always		Often		Sometimes		Never	
	f	%	f	%	f	%	f	%
<i>Learning through presentation</i>	20	21.1	49	51.6	21	22.1	5	5.3
<i>Learning through discovery</i>	5	5.3	36	37.9	45	47.4	9	9.5
<i>Inquiry based learning</i>	21	22.1	46	48.4	25	26.3	3	3.2
<i>Pure Narration</i>	31	32.6	40	42.1	24	25.3	-	-
<i>Discussion</i>	16	16.8	47	49.5	31	32.6	1	1.1
<i>Case study</i>	21	22.1	32	33.7	37	38.9	5	5.3
<i>Demonstration</i>	17	17.9	46	48.4	31	32.6	1	1.1
<i>Problem Solving</i>	22	23.2	41	43.2	28	29.5	4	4.2
<i>Question-Answer</i>	44	46.3	43	45.3	7	7.4	1	1.1
<i>Laboratory</i>	13	13.7	40	42.1	39	41.1	3	3.2
<i>Expedition-observation</i>	5	5.3	8	8.4	61	64.2	21	22.1
<i>Brain storming</i>	33	34.7	42	44.2	17	17.9	3	3.2
<i>Group Discussion</i>	17	17.9	42	44.2	33	34.7	3	3.2
<i>Drama</i>	10	10.5	31	32.6	44	46.3	10	10.5

### 3.2. The findings obtained from the oral interviews with science and primary school teachers

***How do you define the concepts of teaching strategies, methods and techniques?***

The majority of the teachers defined the concepts of strategy and method as “the way followed to achieve the target” (Table 2). As for the concept of technique, especially the majority of science teachers used the definitions they used in the concept of teaching method. For example, a teacher S<sub>4</sub> states: “I can’t fully distinguish, which one is the method and which one is technique?” and another teacher S<sub>17</sub> explained: “Method and technique are synonyms”.

Table 2. The views of the science and primary school teachers about the concepts of teaching strategies, methods and techniques

Strategy	Method	Technique
*The way followed to achieve the target (9S-6P)	*The way we follow to achieve the target (4S-6P)	*The way showing how you can achieve the target (1S-1P)
*Determining the application method about the topic of the lesson (3S-1P)	*The body of the methods exploited in the lesson (4S-1P)	*The instrument we use while carrying out the method (2S)
*All your acts and behaviors in the lesson (2S-2P)	*All of my efforts to have the topic understood (2S-1P)	*The way of applying the method (3S-1P)
*The way in which you use methods and techniques while teaching a subject (2S-1P)	*A subset of strategy (2S)	*A subset of method (1S)

#### Have you ever received in-service trainings in this topic?

%40,9 of science teachers and %63,6 of the primary school teachers who participated in the oral interviews about teaching strategies, methods and techniques stated that they received in-service trainings in this topic. One of the primary school teachers P<sub>8</sub>: “The in-service trainings we have received are useful, however, because we don’t have application environment due to lack of physical conditions, they remain just some knowledge we can’t practice”.

#### Which teaching approach or approaches you basically exploit in your Science and Technology lessons?

%18,2 of the science teachers stated that they adopt multiple intelligence and %45,5 of the primary school teachers stated that adopt constructivist approach as the basic teaching approach in their Science and Technology lessons. Also, %18,2 of Science teachers stated that they basically use student-centered approaches but they didn’t specified which approaches they were.

#### What teaching methods and techniques you most frequently use in Science and Technology lessons?

%13,6 of the Science teachers and %27,3 of the primary school teachers stated that they try to use methods and techniques through which students can learn by doing. However, %40,9 of the science teachers indicated narration and %45,5 of them indicated question-answer method as the method they use most frequently. %31,8 of them indicated experimentation and %13,6 of them indicated drama as the technique they use most frequently. %27,3 of the primary school teachers stated that they use narration method and %72,7 of them stated that they use experimentation technique. As mentioned above, the teachers are confused about the definitions of method and technique and it is noteworthy that they distinguish between the concepts of method and technique.

Table 3. The methods and techniques most frequently used by science and primary school teachers in science and technology lessons

Teaching Methods	Science Teacher		Primary School Teacher		Learning Techniques	Science Teacher		Primary School Teacher	
	f	%	f	%		f	%	f	%
Narration	9	40.9	3	27.3	Experimentation	7	31.8	8	72.7
Question-answer	10	45.5	2	18.2	Drama	3	13.6	1	9.1
Discussion	3	13.6	-	-	Brain storming	2	9.1	2	18.2
Problem solving	1	4.5	1						

#### What do you think the most suitable teaching method and technique for Science and Technology lessons?

%68,2 of the science teachers and %90,9 of the primary school teachers stated that it is the experimentation technique which is the most suitable teaching method and technique for Science and Technology lessons. In addition, %54,5 of the primary school teachers stated it is expedition-observation method. S<sub>19</sub>: “the lesson should be carried out in the laboratory and there should be an experiment set for each of the students”, S<sub>2</sub>: “They should learn by doing, experimenting, seeing”, S<sub>20</sub>: “I would demonstrate the nature completely and teach Science in the nature”, P<sub>9</sub>: “I would be persistent in learning by doing throughout the lesson”, P<sub>11</sub>: “I would arrange the classes in accordance with multiple intelligence beginning from the lowest grades”, said.

#### Do you think that you have the suitable conditions for the approaches, methods and techniques you are using?

%68,2 of the science teachers and %90,9 of the primary education teachers stated that they don't have enough *learning environment* to use different teaching strategies, methods and techniques while %45,4 of the science teachers and %81,8 of the primary education teachers stated that they don't have enough materials. With regard to this, S<sub>4</sub>: “*Our laboratories are too small and they are not suitable to carry out any activity compared to the number of our students*”, S<sub>12</sub>: “*As our laboratories are too small, we have to carry out the experiments as demonstrative experiments*”, S<sub>13</sub>: “*Each class has their own science laboratory and cupboard*”, said (Table 4).

Table 4. The Situation of suitable teaching atmosphere and materials for the strategies, ethods and techniques the science and primary education teachers are using

	Science Teacher				Primary School Teacher			
	Learning Environment		Material		Learning Environment		Material	
	f	%	f	%	f	%	f	%
<i>Adequate</i>	7	31.8	12	54.6	1	9.1	2	18.2
<i>Inadequate</i>	15	68.2	10	45.4	10	90.9	9	81.8

The teachers stated that they can't use the teaching methods and techniques through which the students could actively participate in the lessons due to lack of time, the intensive curriculum, the large population of the classes etc. With regard to this, S<sub>11</sub>: “*The guide book is too detailed. I don't carry out the activity for fear that the students might lose their interest in the lesson and I might not catch their attention again*”, S<sub>4</sub>: “*We can't take the students to the nature and make them observe due to the limited time; we can't organize expeditions to such places as power plants*”, S<sub>13</sub>: “*I can't carry out group works due to the large population of the classes*”, S<sub>6</sub>: “*We have difficulty with the time. The curriculum is so intensive for a 3-4 hour Science and Technology lesson that it is difficult to carry out the activities*”, S<sub>14</sub>: “*In fact the nature must be taught in the nature, but the time is too limited*”, P<sub>2</sub>: “*As the population of the class is 46 and the laboratory is for 20, we try to compensate through other methods when we can't use experimentation method*”, P<sub>4</sub>: “*We don't do due to limited time. 4 hours a week isn't enough*”, said.

#### **How do you think the best learning occurs in Science and Technology lessons?**

%63 of the teachers suggested that the best learning can occur through experimentation. With regard to this, S<sub>1</sub>: “*The child should encounter the problem and find the solutions by doing*”, S<sub>4</sub>: “*Students should learn by seeing, touching and involving all their sense organs in the process and carrying out experiments themselves*”, said.

## **4. Conclusion and Discussion**

How the best teaching can be carried out depends on teachers and learners in general, yet it still closely related to the quality of the strategy employed. For this reason, the studies on teaching strategies, methods and techniques are on top of the list of basic research topics for education scientists. In the previous studies on teaching science, it is noteworthy that teachers display different attitudes and behaviors in this topic (Aktepe and Aktepe 2009; Binler, 2007; Demirezen, 2001; Erdem et al., 2006; Şahin, 2004)

When examined, the data collected in our study conclude that a considerably large number of the science and primary education teachers define the teaching strategy and method as “the way followed to achieve the target” and they can't distinguish between the concepts of strategy, method and technique.

It was seen that almost half of the teachers use teaching strategies and methods based on learning and research through presentation and they sometimes use the teaching strategy through discovery. Demirezen (2001) obtained similar results in his study and determined that primary school teachers use the teaching strategy through presentation in Science and Technology lessons the most.

In the oral interviews we carried out, about half of the primary school teachers stated that they basically adopt constructivist approach while the majority of the science teachers stated that they don't basically employ a certain teaching approach in their lessons. On the other hand, the majority of the science and primary school teachers stated in their answers to the items in the survey that they often use multiple intelligence, constructivist approach, problem based learning, cooperative learning and computer based learning.

Aktepe ve Aktepe (2009) stated in his study that the methods science teachers use most frequently are narration, experimentation in the laboratory and the teacher's demonstration by experimenting in the classroom while they seldom use expedition-observation method; the science teachers never use drama technique. In our study, the

science and primary school teachers stated that they most frequently use narration (%42,1), problem solving (%43,2), discussion, question-answer, demonstration (nearly half of them) while they sometimes use the laboratory (%41,1), case study (%38,9), expedition-observation (%64,2). It was determined that the teachers often use brain storming and group discussion techniques and they sometimes use the drama technique. Similar results were also obtained in Dilek's study (2010) carried out with students and %54,2 of the students stated that a discussion environment isn't created in their lessons, %91,7 haven't carried out drama in science subjects, %83,3 haven't had an expedition to places outside the school. In the same study, the majority of the students indicated pure narration and question-answer methods as the most frequently used methods in Science and Technology lessons.

In the oral interviews, the science teachers stated that they most frequently use pure narration and question-answer methods while %31,8 of the science teachers and %72,2 of the primary school teachers stated that they use experimentation as the teaching technique. It is noteworthy that the primary education teachers use the experimentation technique more in Science and Technology lessons compared to the science teachers. On the other hand when asked which one is the most suitable teaching method and technique in Science and Technology lessons, %68,2 of the science teachers and %90,9 of the primary education teachers stated that it is the experimentation technique, %54,5 of the primary school teachers stated that it is the expedition-observation method. Also, %63 of the teachers stated that the best learning in Science and Technology lessons can occur by hands on activities, that is, carrying out experiments. Yet, both in our study and in the previous studies (Dilek, 2010; İzci et al., 2006) it was determined that the teaching methods and techniques through which the students can actively participate in the lesson such as laboratory, experimentation, expedition-observation and project are not used frequently enough. This concludes that the teachers are not enough to use the methods and techniques even those which they believe in. Similarly, %40,9 of the science teachers and %63,6 of the primary school teachers stated that they have received in-service trainings in teaching strategies, methods and techniques, but they have difficulty in practicing them.

The teaching methods and techniques like experimentation, expedition-observation, drama and practicing from daily life should be dominant in Science and Technology lessons in line with the spirit of hands on activities. The population of the classes should be decreased to create educational environments so that the students can learn by themselves and the credits of the lessons should be increased. Also, teachers should be provided with compulsory in-service trainings to increase their vocational qualifications and skills in teaching strategies, methods and techniques.

## References

- Aktepe, V., Aktepe, L. (2009). Fen ve teknoloji öğretiminde kullanılan öğretim yöntemlerine ilişkin öğrenci görüşleri: Kırşehir BİLSEM Örneği. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi*, Cilt 10, Sayı 1, 69-80.
- Babadoğan, C. (1994). Öğrenme Stilleri ve Stratejileri Arasındaki İlişki. I. Eğitim Bilimleri Kongresi, 28-30 Nisan, Cilt: 3, Balcalı, Adana.
- Binler, A.İ. (2007). Fen Öğretmenlerinin Öğretim Yöntem ve Tekniklerini Kullanma Yatkınlıkları. Kafkas Üniversitesi, Fen Bilimleri Enstitüsü Yayınlanmış Yüksek Lisans Tezi.
- Dilek, N.Ş. (2010). 2004 Fen ve Teknoloji Programının Öğrenci Görüşlerine Göre Değerlendirilmesi. Ondokuz Mayıs Üniversitesi, Fen Bilimleri Enstitüsü Yayınlanmamış Yüksek Lisans Tezi, Samsun.
- Demirezen, S. (2001). Öğretmenlerin Öğretim Stratejileri ile Öğretim Yöntem ve Tekniklerine İlişkin Görüşleri. Hacettepe Üniversitesi, Sosyal Bilimler Enstitüsü Yayınlanmamış Yüksek Lisans Tezi.
- Erdem, A., Uzal, G., Ersoy, Y. (2006). Fen Bilgisi/Fizik Öğretmenlerinin Eğitim Sorunları: Gelişmeleri Sürekli İzlemeleri ve Gerekli Yenilikleri Edinmeleri. Araştırma Raporu, TFV Yayını, Tekirdağ.
- Fidan, N. (1996). *Okulda Öğrenme ve Öğretme*. Ankara: Alkım Yayınevi.
- İzci, E., Özden, M., Tekin, A. (2006). Yeni İlköğretim Fen ve Teknoloji Dersi Öğretim Programının Değerlendirilmesi (Adıyaman İli Örneği). 15. Ulusal Eğitim Bilimleri Kongresi Muğla Üniversitesi Eğitim Fakültesi, 13-15 Eylül.
- MEB, (2005). *İlköğretim Fen ve Teknoloji Dersi 4-5. Sınıflar Öğretim Programı*. Millî Eğitim Bakanlığı, Talim ve Terbiye Kurulu Başkanlığı, Devlet Kitapları Müdürlüğü Basım Evi, Ankara.
- Tatar, N., Kuru, M. (2006). Fen eğitiminde araştırmaya dayalı öğrenme yaklaşımının akademik başarıya etkisi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 31, 147-158.
- Trumbull, J. D., Bonney, R., Schuck, N. G. (2005). Developing materials to promote inquiry: lessons learned. *Science Education*, 89 (6), 879-900.
- Şahin, Ç. (2004). İlköğretim okullarında görev yapan öğretmenlerin kullandıkları öğretim stratejileri. *İnönü Üniversitesi Eğitim Fakültesi Dergisi*, Cilt 5, Sayı 8, 77-93.