

## Teaching Methods and Techniques Used By Teaching Staff during Lectures As Seen By Candidate Teachers (The Example of Bayburt)

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### Article history

#### Received:

20.11.2012

#### Received in revised form:

19.12.2012

#### Accepted:

27.12.2012

#### Key words:

Constructivism, teaching methods and techniques, teaching staff, candidate teachers

The purpose of this study is to determine the extent to which teaching staff are using constructivist approach in teaching methods and techniques they employ during lectures. Sample group of the study is provided by 389 students, 190 of which are enrolled at Science Teaching Department and 199 of which are enrolled at Class Teaching Department of Bayburt Faculty of Education. Measuring device developed by (Sözbilir, Şenocak and Dilber, 2006) was used during the study. Measuring device, consisting of 28 items, was examined by experts in the area and reliability test was conducted. At the end of the study, it has been determined that candidate teachers do not sufficiently employ their activities based on constructivist approach in their teaching methods and techniques that they use during their lectures.

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### Introduction

The newest and the most up-to-date teaching method of today is considered to be the constructivist approach. This approach emphasizes the process of "construction" which means constructing the knowledge and rebuilding the information (Zhao, Zhang, Wang and Chen, 2005). According to the constructivist approach, knowledge is constructed through the individual's own way of living, observation, commentary and mental thinking processes (Horstman and White, 2002; Aslan, 2003; Plourde and Alawiye, 2003; Balım, Aydın and Evrekli, 2006; Adams, 2006; Saunders, 2009). That is, the individual intends to constitute a meaning related to the information on his/her mind and to ascribe the meaning s/he constitutes to her/himself. In other words, individuals construct learning not in its form presented to them but in a form they build within their mind (Yaşar, 1998; Driscoll, 2000; Chen, Burry-Stock and Rovegno, 2000; Kivinen and Pekka, 2003; Plourde and Alawiye, 2003; Özmen, 2004; Pesen, 2005; Balım, Aydın and Evrekli, 2006; Bonner and Chen, 2009).

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The constructivist approach paves the way not for the learners to remember the information but for developing various scientific process abilities such as learning by experience, self-renewal, doing scientific research, logical thinking, critical thinking, understanding and using the information, self-regulation, mental projection, problem solving, establishing hypothesis by dynamic and logical thinking and producing possible solutions (Akgün, 2000; Ray, 2002; Austin, 2004; Adams, 2006; Altun, Turgut and Büyükkasap, 2008). Also, in addition to its supporting the mental development of the students, it also assists the students for gaining the responsibility of self-learning with the help of the teachers' support (Akdeniz and Devocioğlu, 2001; Warwick and Stephenson, 2002; Baylor and Kitsantas, 2005; Altun, 2008).

It is inevitable to see the changes in teachers' roles in learning environments where constructivist approach which anticipates radical changes in teachers' roles is applied (Richetti and Sheerin, 1999 ; Good and Brophy, 2000; Bay, 2008; Yeşilyurt, 2011). In courses which are carried out according to the constructivist approach, the teacher is not the one who transfers information but s/he instead carries the feature of being an individual taking the responsibility of directing or guiding the student (Vermette and Foote, 2001; Evrekli and et al.. 2009). This approach gives the teacher the environmental organiser, the director and the guide roles, not the role of the "teacher" (Terhart, 2003; Bukova and Alkan, 2005; Bay, 2008; Yeşilyurt, 2010). Also, in this approach, in addition to the fact that the teacher takes the role of a mentor for the students' configuration of the information, s/he gives examples from daily life and makes them find correlations between the new information they encounter and their previous knowledge. In short, according to the constructivist approach, the teacher's role is to be a mentor for the students and provide them with proper opportunities for the construction of the information (Taber, 2000; Horstman and White, 2002).

Ministry of National Education has given up its conventional understanding and has put into practice a new program based on the constructivist approach which matches up with the modernisation process (Arslan, 2005). If real applicators are not reached in a recently applied program, the program may fail and there may be great loss of time and labour (Semerci, 2007). As one may understand, it is necessary for the teachers who are going to apply this program to have high-level theoretical information about the program and to be able to apply the program well enough so that this program can be performed successfully. This means that the teachers should know the program very well, internalize it, and they should be capable of applying this program (Akgün and et al, 2005; Arı and Bayram, 2011). But teachers fall behind those changes in education and they demand education for themselves about this issue in order to solve this problem (Akpınar and Aydın, 2007). This mission belongs to pre-service and in-service educational programs which educate the teachers (Richardson, 1999), and it is thought that it is necessary today to carry out the teachers' education in accordance with the constructive method (Richardson, 1999). The reason is that it is an absolute necessity for the teachers and teacher candidates to be in a position to apply the constructivist method and to have the capacity to solve problems faced during the application of the program (Richardson, 1999; Casas, 2004).

There is a positive change in the opinions of the teachers about teaching, who were given in-service education in accordance with the constructivist approach, compared to the ones who were not given this education. In this educational process, the teachers are able to see how to perform the application and what kind of mistakes they made when they applied the constructivist approach in their courses in a better way. Furthermore, by seeing the problems faced during the application of the constructivist approach, teachers can find better and different solutions to the problems in their classes (Kıldan and Temel, 2008). It is also necessary to give importance to pre-service university education of the teacher candidates just like their in-service education (Cochran-Smith, 2001; Matthews, 2002; Lunenberg, 2002; Akar, 2003; Oğuz, 2009; Arı and Bayram, 2011). Taking pre-service education into consideration, it is thought that it is necessary to educate the teachers of the future in accordance with the constructivist approach if they are going to apply a teaching based on the constructivist approach in schools in the future (Abdal-Haqq, 1998; Arslan, 2007; Arı and Bayram, 2011). The teachers of the future who have been educated in a constructivist environment can form a meaningful link between theories and practice (Kesal and Aksu, 2005). The constructivist activities in teacher training programs provide the teacher candidates with the possibility of

improving their abilities in concepts, planning, teaching and reflecting (So and Watkins, 2005). Indeed, the teacher candidate who has been involved in constructivist learning environments knows better the application steps of the constructivist approach, the role of the teacher and the student, what kind of problems a student might have in what type of situations and how these problems can be dealt with. This provides them with the possibility of empathizing with the student's situation and guiding them more easily in their future career (Yanpar Şahin, 2003; Altun, 2008).

The teacher candidates who got their education in constructivist learning environments do not only improve themselves in the constructivist approach but they can also improve their knowledge necessary for their future career, pedagogical formation and general culture. For instance, thanks to the active learning which is one of the basics of the constructivist method provided for them, there can be a meaningful learning in their field knowledge (Berry and Loughran, 2002; Akar and Yıldırım, 2004) and they can learn how to learn (Pankratius and Young, 1995; Cook, Smagorinsky, Fry, Konopak and Moore, 2002; Gürol, 2002). At the same time, they may gain high-level thinking abilities such as scientific process abilities (Gürdal, Şahin and Yalçinkaya, 2002; Altun, 2008). Additionally, teacher candidates who are educated through the constructivist approach learn how to measure their students' performance and there may be positive changes in their attitude towards being a teacher (Bay, 2010).

When we analyse teaching education programs, we see that the education given to teacher candidates is generally from theory towards application (Kesal and Aksu, 2005) and these programs are not able to provide the teacher-candidate students with necessary knowledge and ability so that they can apply the teaching programs in their working experiences (Doğan, 2005; Arı and Bayram, 2011). Moreover, educational faculty students are not qualified enough with the constructivist approach, which is the basic of contemporary teaching programs (Arı and Bayram, 2011). Teacher candidates are taught information types about how to teach and then they are expected to use this information in schools where they work. However, these information types are forgotten by the teacher candidates at the end of the educational process or they are not used at all (Kroll, 2004 ; Kesal and Aksu, 2005). Various studies have begun in our country in order to reconsider the educational system. Especially, Council of Higher Education has started a study about teacher training and reconstructing the educational faculties since 1996. A reconstruction has been made as an outcome of the studies conducted altogether by the Ministry of National Education, educational faculty representatives of the universities and the Council of Higher Education, and some changes have been made in the names of the departments and programs as well as the names of the courses and their contents (Şişman and Acat, 2003). Because what is expected from the universities in the information age is that instead of being institutions generating information for specific groups behind closed doors, they should be able to produce information, keep it, make it common and help the ones using this information (Çağiltay et al., 2007). Therefore, the universities should stick into their duties in order to construct a more effective educational environment (Çelikten, Şanal and Yeni, 2005; Sadi et al., 2008). In order to do this, it is necessary to make the qualities and capacities of some factors such as the teaching staff better (Aydın, 1998).

It is obvious at the same time that it is necessary to reorganise the teaching programs and course contents of the educational faculties in accordance with the new program and with the intention of introducing the philosophy and general approach of the developed programs (Erdoğan, 2007; Arslan, 2007). Especially, it is necessary to focus on the teaching staff of the educational faculties in order to have good teachers in the future. Nevertheless, there is not enough teaching staff which is qualified enough in order to be able to create qualified teacher candidates in educational faculties (Aslan, 2003). To have qualified teachers, it should be kept in mind that it is very important to have a "teacher educating teacher type" [http://physics.comu.edu.tr/etkinlikler/eg\\_yoo\\_d/bildiriler/cahit\\_kavcar.doc](http://physics.comu.edu.tr/etkinlikler/eg_yoo_d/bildiriler/cahit_kavcar.doc); (Küçükahmet, 1992; Nas, 1992; Semerci, 1998; Doğan, 2005). Because these teacher candidates are affected a lot by their teachers' behaviours and approaches rather than what they tell them and their way of teaching (Gözütok, 1988).

The applications made by the teachers in class and their behaviours draw the attention of the students and they can be taken as models (Köseoğlu, 1994; Taşpınar and Tuncer, 2002). Also, teachers usually use the

methods that have been used by their own teachers in their classes (Pankratius and Young, 1995; Korthagen and Kesel, 1999 ; Woolley and et al., 2004). Therefore the teaching staff members are expected to have the qualities necessary to be found in the teachers educated by them and they are expected to show this within their own behaviours (Bilen, 1992; Köseoğlu, 1994; Semerci, 2007). In this respect, constructivist roles are expected from the constructivist teaching staff (Rainer and Guyton, 1999; Goubeaud and Yan, 2004). The teaching staff member should be an example to the teacher candidates through both his/her behaviours and approaches in their courses and the teaching methods s/he employs in class. Thus, the teaching staff members are expected to have enough information about the new, contemporary teaching methods that are going to be applied in class and they should also be able to perform them effectively. Especially, it is necessary for the teaching staff members to have sufficient knowledge and experience about the constructivist approach which forms the basic philosophy of the educational systems today.

The most important of all is that the use of the constructivist approach by the teaching staff members in their courses is important in terms of the teacher candidates' understanding of how to conduct a lesson through the constructivist approach and of the roles of the teachers and the students. For the teacher candidates who take their teachers as models, it can be easier in their future career to apply the constructivist approach. In this respect, in this study, the aim is to determine to what extent the teaching staff members employ the constructivist method in the teaching methods and techniques used by them in their courses.

## **Literature**

In the study conducted by Gözütok (1988), the aim has been to determine the consistency between the teaching of some professional courses in teacher training and the behaviours of the teaching staff members. Ten teaching staff members from six different education faculties were involved in this study. At the end of the study, it was found out that teacher candidates are mostly affected by the teaching staff members education them. In the study made by Akgöl (1994), the aim has been to make a comparison between the teaching staff at faculties of education and the opinions of the students about the qualifications of an ideal teaching staff member, and the suitability of the teaching staff members in their own institutions to these qualifications.

The qualifications that are expected to be found in teaching staff members were analysed in terms of personality, profession, measurement and assessment. 350 last year students and 153 teaching staff members from three different education faculties were taken as the sample group. Different evaluations were made by the students and the teaching staff members in accordance with their faculties in terms of their expectations of finding these qualifications in their own teaching staff members. There was a meaningful difference between the opinions of the students and the teaching staff members about the necessity of the dimensions of "personality", "profession", "measurement and assessment", "human relations", which is expected to be found in an ideal teaching staff member.

## **Method**

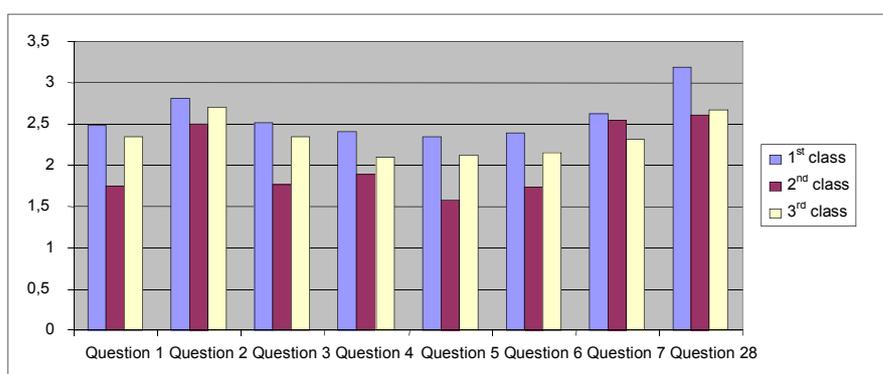
The study was conducted at Bayburt University Faculty of Education in 2008/2009 academic period. Since participation in this study was based on voluntariness, last year students stated that they were quite busy and tired and they did not want to participate in it. The sample group of the study were composed of 190 teacher candidates going on their education at the Department of Science Teaching (first year: 82, second year: 77 and third year: 31) and 199 teacher candidates going on their education at the Department of Primary-School Teaching (first year: 57, second year: 74 and third year: 68), all of which were 398 participants in total. In the study, the measurement tool obtained through literature was employed (Sözbilir, Şenocak and Dilber, 2006). The measurement tool which was made of 28 items was examined by the experts and looking at the calculations of reliability reapplied to the scale, it was determined that the Cronbach Alpha Reliability coefficient would be 89.

The scale was composed of four parts including general teaching methods, specific teaching methods, field knowledge and measurement – assessment. The students were asked to indicate their level of agreement with the given definition in a four-choice scale of 1 (never), 2 (sometimes), 3 (frequently) and 4 (always). The first category (General teaching activities) was developed to understand whether the use of the teaching activities by the teachers were useful in the students’ understanding of the topic (questions 1-7, 28). The second category (Specific teaching activities) involves the activities used by the teachers in their courses in order to make the lesson more challenging (resemblance, experimental performance, different examples and various explanations) (questions 8-13, 25, 26, 27). For the third category (field knowledge), students’ opinions about the satisfactoriness of their teacher’s professional knowledge (Physics, Chemistry etc.) were taken (questions 14-18). As for the fourth category (measurement-assessment), the capabilities of the teachers in evaluating the students in units, lessons or shorter activities were measured (questions 19-24).

### Findings

The results of this study which aims to determine to what extent the teaching staff members apply the basic elements of the constructivist approach according to the teacher candidates have been given below as figures and tables. In each figure, question groups given in measurement tool have been given altogether. The figures show the average of the answers given to the questions by the students in different classes. The answers given by the students to the questions which have approximately the same main idea are mostly consistent with each other. This is thought to be an indicator of the fact that the students answered the scale sincerely.

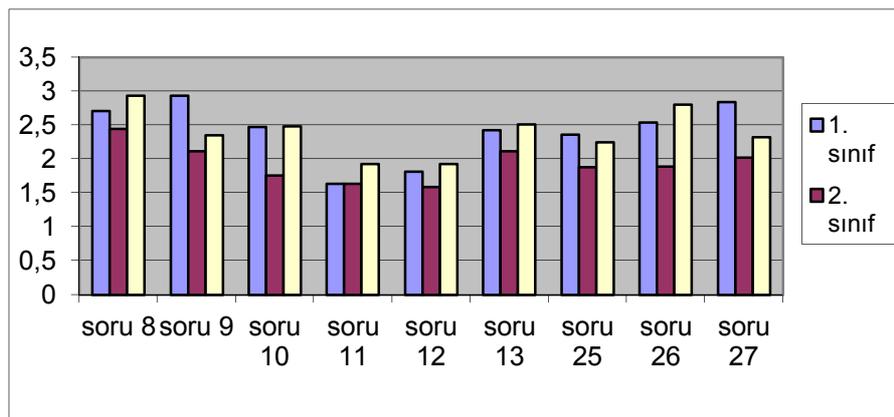
General Teaching activities involve items such as “Our teachers use models when necessary so that we could understand Science topics more easily” or “The way that our teacher does a lesson makes me think about the topic.” As also seen in Figure 1, according to the results of the answers given to the second question, it can be understood that the teaching staff members give their students the chance to speak about their own opinions. When the answers given to the questions 1, 3, 4, 5 and 6 are examined, it can be noticed that the teachers do not give enough place in their teaching to the activities such as model using, doing confirmative activities, trying to increase the interest of the students in Science lessons, giving the students the opportunity to tell their viewpoints about the subject and directing the students towards a constructivist thinking through the activities during the lessons. Moreover, the results show that the students consider the teachers to be sufficient enough in giving homework that motivates them to do research related to the lesson. When it comes to the answers given to the question 28, it is observed that the teaching staff members would ask the students if they understood the topic and they would retell the parts that they were not able to understand enough once more.



**Figure 1.** The averages of the answers given by the Science Teaching students to the questions about general teaching activities.

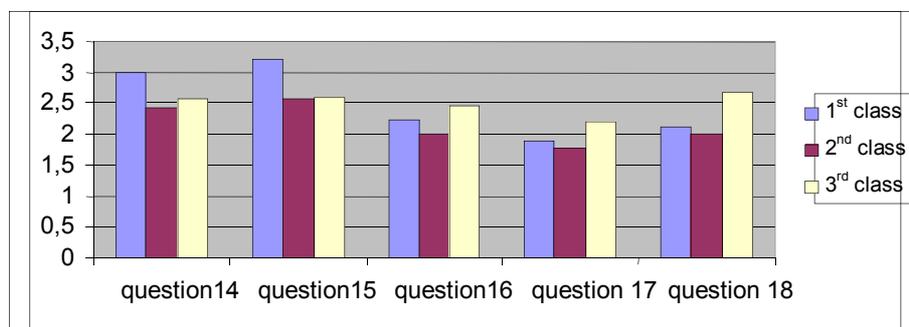
In the section under the title of Specific teaching activities, some items can be found such as “Our teachers do experiments so that we can learn Science topics better”, “Our teachers use visual materials so that we

can understand the topics better”, and “our teachers talk about the historical development of the scientific inventions in courses.” When the answers given by the Science teacher candidates to these items are examined, it can be commented that in general, they think in a negative way a little bit. But if the answers given to the definition of “Our teachers are interested in only a few students during the lesson”, which is item 21, are analysed, it can be observed that the students give very positive answers. Therefore, it can be inferred from the results achieved that the teaching staff members try to show their interest in all students in their lessons or they try to do so at least. The distribution of the answers given to the questions 9, 10,11, 13,25,26 and 27 show that the teachers do not do enough experiments during their courses, they talk about the historical development of the scientific inventions very little, and they do not use enough visual material. Also, it can be inferred from the data collected that the teachers do not give enough space to different teaching methods so that the students can understand the lesson better, that they do not use technological tools enough and that they give their lesson mostly in a teacher-centred way. When we look at the eighth item, we can comment that they are much better in giving examples from daily life.



**Figure 2.** The averages of the answers given by Science Teaching students to the questions about specific teaching methods

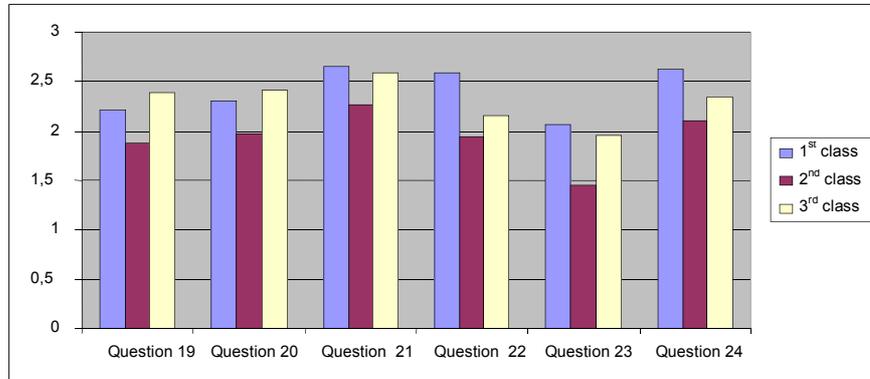
In this section under the title of Field Knowledge, it has been attempted to determine the thoughts of the students about their teachers’ field knowledge. It is obvious from the answers given to the questions 14 and 15 that the teachers have a command in the topics that they tell their students and they are able to answer the questions asked by the students. However, if we have a look at the items 16, 17 and 18 from Figure 3, we can say that the teachers do not talk enough about the relation between Science and technology, that they do not focus much on how the scientific inventions were achieved, and that they mention the significance of Science in our daily life very little.



**Figure 3.** The averages of the answers given by the Science Teaching students to the questions about field knowledge

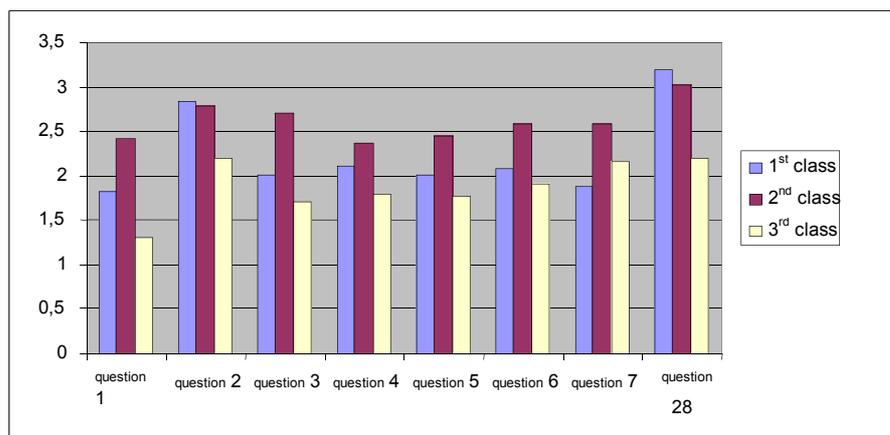
In this section, the measurement-assessment methods used by the teaching staff members have been evaluated in accordance with the students’ viewpoints. According to the answers given by the students to the question 21, it is seen that the teachers give more importance to the students’ making comments and

expressing their opinions than their solving numerical problems. Moreover, when we have a look at the items 19, 20, 23 and 24, we can infer that the students cannot answer the questions that are asked to them in class and examinations easily and that they think the questions asked by their teachers are much harder than the questions in other sources and that they think these questions do not evaluate enough if the students learned the topic or not. Besides, if the item 22 is analysed, it can be noticed that teaching staff members do not ask enough questions to the students so that they can understand the topic and have discussions on it.



**Figure 4.** The averages of the answers given to the questions about measurement-assessment by the Science Teaching students

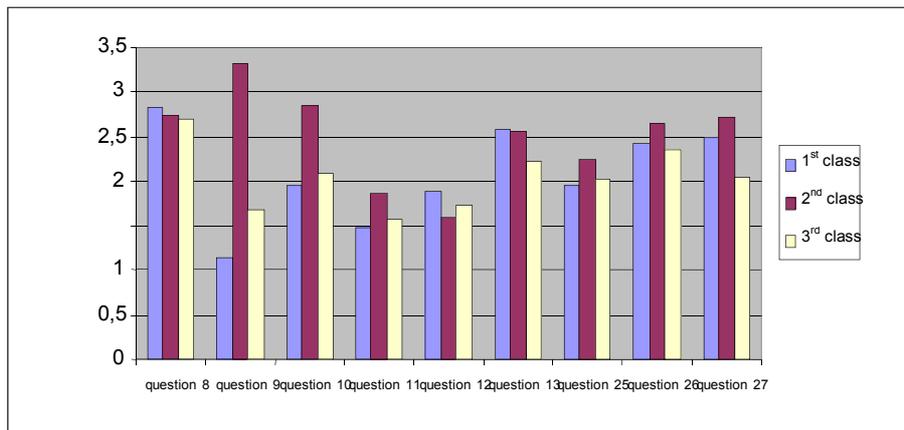
When the answers given by the Primary-Teaching students to the items in the general teaching activities are examined, it can be seen from the items and 2 and 28 that the teachers give the students the chance to speak about the topics discussed during the class and that they tell the topics that they were not able to understand again and again. If we have a look at item 1, despite the fact that it is very important for these students who are primary school teacher candidates to love Science and to make their students love Science, it has been observed that the way that the teaching staff members do their lessons is not efficient enough to increase the teacher candidates' interest in Science. As also seen in Figure 5, from the answers given to items 3, 4, 5, 6, and 7, it can be inferred that the teaching staff members do not use enough models in order to make their students understand Science topics much more easily. Furthermore, despite the fact that they give place to some activities such as activities that reinforce the students' learning and that lead them to think and do research, it can be stated that these are not on adequate levels either.



**Figure 5.** The averages of the answers given by the Primary-Teaching students to the questions about general teaching activities

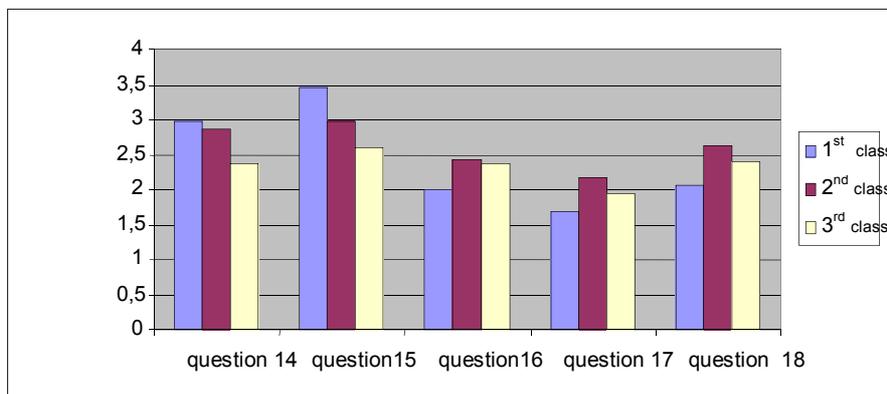
In this section where the use of specific teaching methods by the teaching staff members are examined, it can be said that teacher candidates expressed that they do not agree with the question 12 again, which

means not only one student but all students were being paid attention. Besides, it is important for these students who are going to be primary school teachers to have some professional qualifications and to gain the related knowledge and abilities such as knowing the visual states of the topics, learning the topics better and to know how a topic is taught through another teaching method so that they can teach their students the Science topics better in their future career. However, from the answers that the students gave to the items 9, 10 and 25, it can be observed that experiments related to the topic, visual materials and different teaching methods are not given enough place. When the item 11 is examined from Figure 6, it is seen that the teachers do not focus enough on the historical development of the scientific inventions that are necessary for understanding and internalizing the “nature of science”, which is very important for all teachers and teacher candidates. As for the items 8, 13, 26 and 27, it can be noticed that the teachers benefit from some examples that are known by everyone while explaining Science topics, talk about the concepts given in the topic by finding resemblances to some events faced in daily life, use technological tools, and they are more careful about doing the lessons as student-centred.



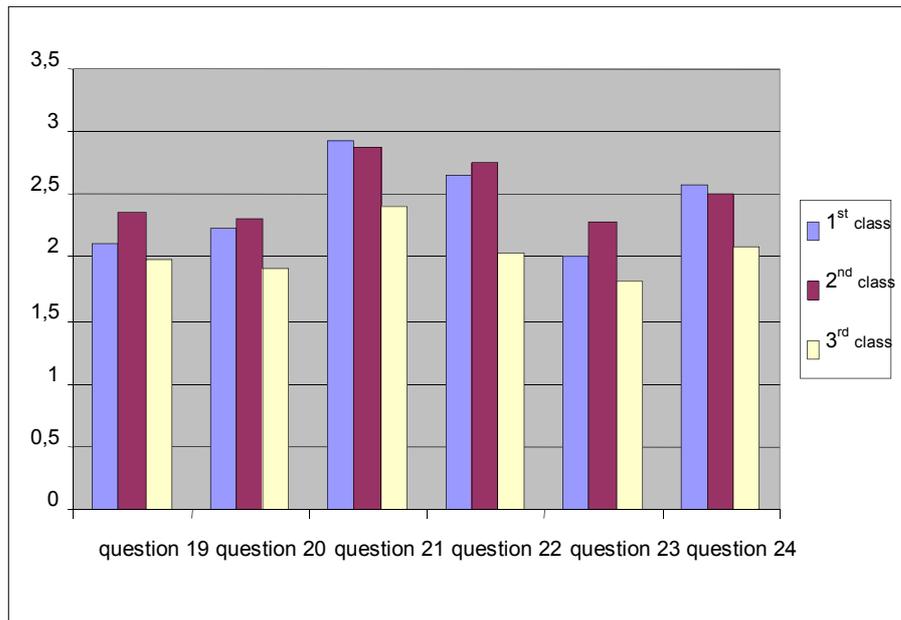
**Figure 6.** The averages of the answers given by the Primary Teaching students to the questions about specific teaching methods

In this section where the field knowledge of the teaching staff members is evaluated through the eyes of the students, when the items 14 and 15 are given attention, it can be observed that the teachers have a command of the topics they tell and that they can answer the questions asked by the students. In addition, when the items 16 and 18 are analysed, it can be said that they intend to be devoted about talking about the relationship between Science and technology as well as focusing on the place of Science in daily life. As we discussed before, in order to develop the perception of “the nature of science” which is necessary for the teachers and teacher candidates to understand, comment on and internalise Science much better, they are expected to have the knowledge of the working of science, the features of a scientist, and the steps of science. In this respect, when the results of the item 17 answered by the students are analysed, it can be inferred that the teachers do not give enough information about how the scientific inventions are done.



**Figure 7.** The averages of the answers given by the Primary Teaching students to the questions about field knowledge

In this section, to what extent the teaching staff members are able to apply the measurement-assessment procedure which is based on the constructivist approach have been examined from the students' point of view. From the answers given by the students to the items 21, 22 and 24, it can be inferred that the teachers ask questions that need thinking and commenting rather than numerical problems, that they provide the students with discussion topics by asking them questions that may help understanding the topic better and that the questions they ask in examinations are qualified enough to measure if the topic was understood by the students or not. But still it is necessary to increase such activities and specialties. When we have a look at the items 19, 20 and 23, we can see that the students find the questions asked in class and examinations quite hard and these questions are considered to be harder than questions in journals and books.



**Figure 8.** The averages of the answers given by the Primary Teaching students to the questions related to measurement-assessment

**Table 1.** An evaluation of the answers given to the scale by Science Teaching and Primary School Teaching students

Sections	Average	N	Std. Deviation	sd	t	p
Science Teaching Department	64.33	190	11.42			
Primary School Teaching Department	64.85	199	11.19	387	-.460	.646

The results of the t test which was made to determine if there is a meaningful difference between Science Teaching students and Primary School Teaching students in terms of their evaluating the teaching staff members show that there is not a meaningful difference between two programs in terms of evaluating the teaching staff members ( $t(387)=-.460$ ;  $p>0.05$ ). When we have a look at the average of the answers given to the scale in which the intention is to determine to what extent the teaching staff members take the

constructivist approach as the basis in the methods and techniques that they employ in their classes (Science Teaching = 64.33; Primary School teaching =64.85), it is seen that the average points of the two groups are quite close to each other.

## **Discussion**

Educating teachers who are the fundamentals of education draws attention as a problem of education waiting to be solved. It is necessary to give a good education to the teachers who ensure the development and configuration of the new generations in order to have knowledge related to their occupation (Küçükahmet, 1992; Köseoğlu, 1994). But the service produced by the education system may not happen over the qualifications of the personnel going to make this system work ([http://physics.comu.edu.tr/etkinlikler/egyood/bildiriler/cahit\\_kavcar.doc](http://physics.comu.edu.tr/etkinlikler/egyood/bildiriler/cahit_kavcar.doc)). That is, if attention is paid to the fact that the qualifications of the students become identical with the teachers' qualifications, it can be noticed that the qualifications of the teachers have a significant state in terms of the process of the educational system and its being successful. To be able to get profitable results from the educational system is mostly related to the quality of the teacher (Köseoğlu, 1994; Şimşek, 2005; Çağıltay et al., 2007). That is why the professional and personal capabilities of the teaching staff members at the faculties of education highly affect the essence of the students who will be teachers (Bilen, 1992; Semerci, 1998; Atıcı and Bora, 2004; Yanpar-Yelken, Çelikkaleli and Çapri, 2007). The reason is that the teacher's qualifications are related highly to the qualifications of the teachers that educate those (Nas, 1992; Gömleksiz, 2003).

In this respect, the professional behaviours that the teacher candidates show in their own classes should be examined and the deficiencies should be removed (Bilen, 1992; Semerci, 1998; Yanpar-Yelken, Çelikkaleli and Çapri, 2007). The constructivist teacher trainer should take the roles of providing cooperation, reflection, participation and interdisciplinary acting and so s/he should give possibility to the democratic applications (Rainer and Guyton, 1999). On the other hand, precautions should be taken so that the teaching staff members can be involved in the field in which they teach teacher candidates. In other words, it should be done so that teaching staff members can gain more information and experience about the applications that exist in schools. It is clearly obvious that the stronger the link between the universities and the schools is, the more qualified the teachers can be. Also, it is quite important to keep the teaching staff members updated continuously about the teaching programs and applications in schools through seminars and similar activities (Ari, 2010). It is also important to make sure that the teaching staff members should transfer their existent knowledge and experiences to the teacher candidates. For instance, feedbacks should be given to the teacher candidates and they should be provided with the environment to learn by actual experience so that the teacher candidates could gain the experiences such as preparing lesson plans suitable for the application of the constructivist approach in courses such as school experience and teaching practice and that they could make the applications of these (Evrekli, Şaşmaz Ören and İnel, 2010).

## **Results**

The results are listed below in this study in which the teaching methods and techniques used by the teaching staff members were evaluated by the students (teacher candidates). It can be said that generally Primary Teaching students and Science students put the emphasis on the same points and detect the same deficiencies and the same proper situations. It has been found out that the teachers of the both students groups gave the students the opportunity to Express their opinions, that they would retell the topic if it was not understood, that they were interested in not only a group of students but all students instead, that they gave place to examples from daily life in their courses, that they had a command of the topics they were talking about and they were able to answer the questions of the students, and that they though they gave enough space to questions which make them comment and express their opinions rather than solving the numerical problems. On the other hand, it has been realised that the students who participated in the research believed the way that the teaching staff members did their lessons was not sufficient enough in increasing the interests of the students in science courses, using models for making it easier to understand science topics, making them think about the topic, arranging activities in order to reinforce their learning, doing related experiment, using visual material and benefitting from different teaching methods. Also, the

students stated that they had difficulty in answering the questions asked by the teaching staff members in their lessons and examinations and that these questions were harder than the ones in other resources. At the same time, another point underlined is that the teaching staff members did not talk enough about the historical development of scientific inventions and how the scientific inventions came into being, which would contribute to the development of the perception of “the nature of science”, which is very important for teachers, teacher candidates and students.

Despite the fact that there was a difference between the points that the student groups gave to some items, it was realised that this difference was between very small values. In general, although the total scale averages of the Science Teaching students and Primary Teaching students were 64.33 and 64.85 respectively, it was calculated as 2.29 and 2.31 respectively in terms of the items in the scale. Besides, it was noticed that the student groups thought different from each other about their teachers’ directing the students to do research related to the topics discussed in class, about talking on some concepts by likening them to daily life events, making the students open up discussions by asking questions about the topic, benefiting from technological tools and talking about the relation between Science and technology. Additionally, it can be said that there was a very little difference in their opinions about doing the lessons as student-centred and the exam questions’ measuring if the students understood the topic or not.

As an overall evaluation, it can be inferred that the teacher candidates did not predicate on the constructivist approach in the methods and techniques used by their teachers in their classes. But if it is thought that the betterment in the qualifications of the students is related to the teacher, it is primarily necessary for the teacher to present model behaviours and approaches. In other words, the qualifications that the teacher candidates who are the students at the faculties of education are expected to have in their future career should be found in the teaching staff members that they take as models for themselves. By observing, modelling and imitating, the teacher candidate can gain these features quite easily. If we think that a student learns the best by experience, the teacher candidates who took their courses in accordance with the constructivist approach would be familiar with the constructivist approach at least and it would not be hard for them to apply this approach in their own classes.

If the lesson is given to the teacher candidates through the constructivist approach, it can be much easier for them to understand the effects of the active learning environment on the students and the role of the students in active learning environments since the teacher candidates take the role of the students in class. It is important to provide the necessary means so that the teacher candidates can internalise the importance of active learning in teacher training and that they can gain the ability of applying it. It can be much more possible through the teacher candidates’ applying the constructivist approach in the roles of both the teacher and the student. Contemporary teacher training programs should definitely give place to constructivist principles and so the teacher candidates can be educated as more qualified and more equipped.

## References

- Abdal-Hagg, I. (1998). Constructivism in teacher education: considerations for those who would link practice to theory: Clearinghouse on Teaching and Teacher Education, education resources information centre.
- Bevino, M. M., Dengel, J., Adams, K. (1999). Constructivist theory in the classroom: Internalizing concepts through inquiry learning. *The Clearing House*, 72(5), 275-278.
- House, C. H. L. (1999). from practice to theory: a social constructivist approach to teacher education. *teachers and teaching. Theory and Practice*, 5(2), 203–218
- Adams, A. (2006). *Education: from conception to graduation a systemic, integral approach*. Unpublished PhD thesis. California Institute Of Integral Studies, San Francisco.
- Akdeniz, A.R and Devocioğlu, Y. (2001). evaluation of secondary education project conducted in physics courses. [ortaöğretim fizik derslerinde yürütülen proje çalışmalarının değerlendirilmesi]. Maltepe University of Science and Education Symposium, Proceedings, İstanbul.

- Akgöl, H. (1994). *Ideal for peer teaching staff and students with a self Institutions Lecturers' Perceptions of Instructor Qualifications element Suitability Comparison of these attributes*. Unpublished PhD Thesis, Dokuz Eylül University, School of Social Sciences, Izmir.
- Akgün, Ş. (2000). *Course tools made simple environment means*. [Çevre İmkânlarıyla Basit Ders Araçları Yapımı]. Giresun: Peak offset.
- Gözütok, D. A. and Özcan, K. C. (2005). Primary evaluation of programs in terms of teacher qualifications. [İlköğretim programlarının öğretmen yeterlilikleri açısından değerlendirilmesi]. New Primary School Curriculum Assessment Symposium. 14-16 November Kayseri.
- Akar, H. (2003). *Impact of constructivist learning process on preservice teacher education students' performance, retention, and attitudes*. Unpublished dissertation, Middle East Technical University, Turkey.
- Akar, H. and Yıldırım, A. (2004). Using constructivist teaching activities classroom management. a field survey. [oluşturmacı öğretim etkinliklerinin sınıf yönetimi dersi'nde kullanılması: bir eylem araştırması]. Sabancı University, Best Practices Conference. <http://www.erg.sabanciuniv.edu/iok2004/bildiriler/Ali%20Yildirim.doc>
- Akpınar, B. and Aydın, K. (2007). Change in education and teachers' perceptions of change. *Education and Science*, Vol. 32, No 144., 71-80.
- Altun, S. (2008). *Electric field-based teaching method students' academic achievement project, physics and science process skills against the effect of attitudes*. Unpublished Ph.D. Dissertation, Ataturk University, Erzurum.
- Altun, S. (2008). The effect of project based learning on the science undergraduates' belief of self –efficacy towards physics. XIII. IOSTE Symposium, September 21-26, Turkey.
- Altun, S., Turgut, Ü. and Büyükkasap, E. (2008). Group work with project-based teaching method applied investigation of the effect of student teachers' self capabilities. ICES' 08 23-25 June, North Cyprus.
- Arı, A. (2010). The level of knowledge and skills of elementary education program students gained at the faculty of education as perceived by prospective teachers. *Ahmet Keleşoğlu Journal of Education Faculty*, Sayı 29, Sayfa 251 -274,
- Arı, E. and Bayram, H. (2011). The influence of constructivist approach and learning styles on achievement and science process skills in the laboratory. *Primary Education Online*, 10(1), 311-324, [Online]: <http://ilkogretim-online.org.tr>
- Aslan, K. (2003). An assessment of the restructuring of the faculties of education. *Journal of Social Sciences, Balıkesir University*, 6(9) ,ss.23-37.
- Arslan, M. M. (2005). Establishment of the republic in terms of the philosophy of the new elementary programs, paper presented at the new primary school curriculum assessment symposium, kayseri erciyes university. [cumhuriyetin kuruluş felsefesi açısından yeni ilköğretim programları,yeni ilköğretim programlarını değerlendirme sempozyumu], Kayseri: Erciyes Univeristy.
- Arslan, M. (2007). Constructivist approaches in education [eğitimde yapılandırmacı yaklaşımlar]. *Journal of Ankara University Faculty of Education*, 40(1), 41-61.
- Atici, T. and Bora, N. (2004). Suggestions and evaluation of teaching methods that are used for biology education in secondary education. *Journal of Social Sciences, University of Afyon*, 6(2), s.51-64
- Aydın, A.(1998). Restructuring of the faculties of education and teacher training problem. *Education Management*, 15, s. 275-286
- Balim, A., Günay., A, G. and Evrekli, E. (2006). Science and technology education the importance of using mind maps and concept maps. [fen ve teknoloji öğretiminde zihin haritaları ve kavram haritaları kullanmanın önemi]. Famagusta, Turkish Republic of Northern Cyprus: VI. International Educational Technologies Conference.
- Bay, E. (2008). *Evaluation of the effectiveness of a constructivist teacher education program applications*. Unpublished PhD thesis, Ataturk University, School of Social Sciences.
- Bay, E., Ozan, C., Kaya, H. İ., Gündoğdu, K., Taşgin, A., Küçüköğlü, A., and Köse, E. (2010). Prospective teachers' opinions on social constructivist learning environment learner roles. [öğretmen adaylarının sosyal yapılandırmacı öğrenme ortamlarındaki öğrenen rollerine ilişkin görüşleri]. II International Symposium on Teacher Education Policies and Issues, Hacettepe University, Ankara.

- Baylor, A. and Kitsantas, A. (2005). A comparative analysis and validation of instructive and constructivist self-reflective tools for novice instructional planners. *Journal of Technology and Teacher Education*, 13(3), 433-457.
- Berry, A. and Loughran, J. (2002). Developing An Understanding Of Learning To Teach In Teacher Education. In J. Loughran & T. Russell (Eds.), *Improving Teacher Education Practices Through Self-Study* (pp. 13–29). London.
- Bilen, M. (1992). Impact on productivity in education teacher personality traits. *Journal of Hacettepe University Faculty of Education*, s. 8
- Bonner, S. M., and Chen, P. (2009). Teacher candidates' perceptions about grading and constructivist teaching. *Educational Assessment*, 14, 57-77
- Bukova, E. and Alkan, H. (2005). Evaluating pilot study of reconstructed turkish elementary school curriculum. *Educational Sciences: Theory & Practice*, 5 (2), s. 385-425.
- Casas, M. (2004). Making pedagogical theory come alive. *The Teacher Educator*, 39(3), s.170-183.
- Cochran-Smith, M. (2001). "Constructing outcomes in teacher education: policy, practice and pitfalls. *Education Policy Analysis Archives*, 9 (11), s. 1-68.
- Cook, L. S., Smagorinsky, P., Fry, P, Konopak, B. and Moore, C. (2002). Problems in developing a constructivist approach to teaching: one teacher's transition from teacher preparation to teaching. *The Elementary School Journal*, 102 (5), s. 389-413.
- Chen, W., Burry-Stock, J. A. and Rovegno, I. (2000). Self-Evaluation of expertise in teaching elementary physical education from constructivist perspectives. *Journal of Personnel Evaluation in Education*, 14(1), 25-45.
- Çelikten, M.; Şanal, M. and Yeni, Y. (2005). Teaching profession and features. *Journal of Erciyes University Institute of Social Sciences*,19(2), s. 207-237.
- Doğan, C. (2005). Policies and problems of primary school teacher training in Turkey. *Bilig*, 35, 133-149.
- Driscoll, M. (2000). *Psychology of Learning for Instruction*. Allyn&Bacon: Massachusetts.
- Erdoğan, M. (2007). Newly developed curriculum fourth and fifth grade science and technology analysis. *Journal of Turkish Educational Sciences*, 5/2, 221-254.
- Evrekli, E, Şaşmaz, F, Ö and İnel, D.(2010). Practical approach to constructivist teacher candidates' competency self gender, and class level variables in terms of section. [öğretmen adaylarının yapılandırmacı yaklaşımı uygulamaya yönelik öz yeterliliklerinin cinsiyet, bölüm ve sınıf düzeyi değişkenleri açısından incelenmesi]. International conference on New Trends in Education and Their Implications 11-13 November 2010, Antalya-Turkey
- Evrekli, E, İnel, D, Balim, A. G. and Kesercioğlu, T. (2009). Investigation of constructivist approach to teacher candidates' attitudes towards science. *Uludag University Journal of Education*, 22(2), s. 673-687
- Good, T., and Brophy, J. (2000). *Looking In Classrooms* (8th ed.). New York: Longman.
- Goubeaud, K. and Yan, W. (2004). Teacher educators' teaching methods, assessments and grading: a comparison of higher education faculty's instructional. *The Teacher Educator Vol 40* (1).
- Gömlüksiz, N. (2003). *Qualifications of the teaching profession, teaching profession*. [öğretmenlik mesleğinin nitelikleri, öğretmenlik mesleği]. (Ed): Mehmet Taşpınar, Elazığ: University Stationery.
- Gözütok, D. (1988). *Instructor teaching behaviour reflection in teacher education, professional formation*. Unpublished PhD Thesis, Ankara University, School of Social Sciences, Ankara.
- Gürdal, A., Şahin, F. and Yalçinkaya, T. (2002). Integration in the development of science teaching materials. *Atatürk Education Faculty of Education Sciences journal*, 16, s.71-80.
- Gürol, M. (2002). Educational technology, new paradigm: oluşumculuk. *Journal of Social Sciences, Fırat University*, 12(1), 159-183.
- Horstman, B. and White, W. G. (2002). Best practice teaching in college success courses: integrating best practice teaching methods into college success courses. *The Journal of Teaching and Learning*. 6(1). S. 6-15.
- Kesal, F. and Aksu, M. (2005). Constructivist learning environment in elt methodology II courses. *Journal of Hacettepe University Faculty of Education*, (28): 118-126.
- Kildan, O. and Temel, F. (2008). The effects of in-service training practices for preschool teachers in line with the constructivist approach to determine teachers. *Kastamonu Education Journal* 16, s. 25-36

- Kivinen, O. and Pekka, R. (2003). From constructivism to a pragmatist conception of learning. *Oxford Review of Education*. Vol:29, no:3.
- Korthagen, F. and Kessels, J. (1999). Linking theory and practice: changing the pedagogy of teacher education. *Educational Researcher*, 28 (4), 4-17.
- Köseoğlu, K. (1994). *Lecturer in primary teacher training institutions in competency evaluation*. Ankara university, school of social sciences, Unpublished Master Thesis, Ankara.
- Kroll, L. (2004). Constructing constructivism: how student-teachers construct ideas of development, knowledge, learning, and teaching. *Teacher and Teaching: Theory and Practice*, 10(2), s. 199–221.
- Küçükahmet, L. (1992). In-service training: theory and applications. [hizmet içi eğitim: teori ve uygulamaları]. Ankara: Gazi University Faculty of Communication Press.
- Lunenberg, M. (2002). Designing a curriculum for teacher educators. *European Journal of Teacher Education*, 25(2&3), 263-277.
- Matthews, M. R. (2002). Constructivism and science education: A further appraisal. *Journal of Science Education and Technology*, 11(2), 121-134.
- Nas, R. (1992). Primary teacher training. *Journal of Hacettepe University Faculty of Education*, 8.
- Özmen, H. (2004). Technology assisted constructivist learning theory and science teaching (constructivist) learning . *The Turkish Online Journal of Educational Technology*, 3(1).
- Pankratius, W. J. and Young, M. W. (1995). Perspectives on education: a constructivist approach to an introductory course. *Education*, 115(3), s. 363–370.
- Pesen, C. (2005). Evaluation of new primary mathematics curriculum according to constructivist learning approach. reflections on education. [yapılandırmacı öğrenme yaklaşımına göre yeni ilköğretim matematik öğretim programının değerlendirilmesi. eğitimde yansımalar]. VIII. New Primary School Curriculum Assessment Symposium. 14-16 Kasım 2005.
- Pierce, J. and Kalkman, D. (2003). Applying learner centred principles in teacher education. *Theory Into Practice*, 42(2), s. 127–132.
- Plourde, L. and Alawiye, O. (2003). Constructivism and elementary preservice science teacher preparation: knowledge to application. *College Student Journal*, 37(3), s. 334-341.
- Rainer, J. and Guyton, E. (1999). Democratic practices in teacher education and the elementary classroom. *Teaching and Teacher Education*, 15 (1), s. 121-132.
- Ray, J. (2002). Constructivism and classroom teachers: what can early childhood teacher educators do to support the constructivist journey?. *Journal of Early Childhood Teacher Education*, 3(4), 319-325.
- Richardson, V. (1999). Teacher education and the construction of meaning. In G. Griffin (Ed.), *The education of teachers* (pp. 145–166). Chicago: The University of Chicago Press.
- Richetti, C. and Sheerin, J. (1999). Helping students ask the right questions. *Educational Leadership*, 57(3), 58-62.
- Saunders, S.G. (2009). Scenario Planning: A Collage Construction Approach, *Foresight: The Journal of Future Studies, Strategic Thinking and Policy*, 11(2):19-28.
- Semerçi, Ç. (1998). Courses global assessment scale (CGAS). [dersleri genel değerlendirme ölçeği (DGDÖ)]. VII. National Congress of Education Sciences, 9-11 Eylül, Konya: Selcuk University, Faculty of Education. Proceedings, s.337.
- Semerçi, Ç. (2007). A view to the new primary school curricula with the metaphors relating to “curriculum development. *Journal of Social Sciences University of the Republic*, 31(2), s.125-140.
- So, W. and Watkins, D. A. (2005). From beginning teacher education to professional teaching: a study of the thinking of hong kong primary science teachers. *Teaching and Teacher Education*. 21, s.525–541.
- Sözbilir, M., Şenocak, E. and Dilber, R. (2006). Through the eyes of students teaching methods and techniques used by science teachers lessons. *Journal of Education National*, 172, s.276-286.
- Şimşek, H. (2005). Stability and change in education reform. [eğitimde reform ve değişim kararlılığı. eğitim fakültelerinde yeniden yapılanmanın getirdiği sorunlar paneli], Gazi University Faculty of Education.
- Şişman, M., and Acat, B. (2003). Study of school experiences practices and its effect on the perception of teaching profession. *Journal of Social Sciences, Firat University*, 13(1), s.235-250.
- Taber, K. (2000). Chemistry lessons for universities: a review of constructivist ideas. *university Chemistry Education*. 4(2), s. 63-72.

- Taşpınar, M. and Tuncer, M. (2002). Elements of effective teaching behaviors in the classroom teaching. [öğretim elemanlarının sınıf içi etkili öğretmenlik davranışları]. XI. Congress of Education Sciences, 23-26 Ekim. Lefkoşa: Near East University.
- Terhart, E. (2003). Constructivism and teaching: a new paradigm in general didactics? *Journal Curriculum Studies*, 35 (1): 25–44.
- Ülgen, E. (2007). Habits and expectations for the use of instructional technology at the university: a descriptive study. [Öğretim teknolojilerinin üniversitede kullanımına yönelik alışkanlıklar ve beklentiler: betimleyici bir çalışma]. Academic Computing Conference, Kütahya.
- Vermette, P. and Foote, C. (2001). Constructivist philosophy and cooperative learning practice: toward integration and reconciliation in secondary classrooms. *American Secondary Education*. 30(1), s.26-37.
- Warwick, P. and Stephenson, P. (2002). Editorial article reconstructing science in education: insights and strategies for making it more meaningful. *Cambridge Journal of Education*. 32(2), 143-151.
- Woolley, S., Benjamin, W-J. and Woolley, A. W. (2004). Construct validity of a self-report measure of teacher beliefs related to constructivist and traditional approaches to teaching and learning. *Educational and Psychological Measurement*. 64(2). 319-331.
- Yanpar-Yelken, T, Çelikkaleli, Ö. and Çapri, B. (2007). Teachers' views on quality standards for the faculty of education. *Mersin University Journal of the Faculty of Education*, Vol. 3, Issue 2, pp. 191-215
- Yanpar Ş. T. (2003). Student teachers' perceptions of instructional technology: developing materials based on a constructivist approach. *British Journal of Educational Technology*, 34(1), s.67–74.
- Yaşar, Ş. (1998). Constructivist theory and teaching-learning process. *Anadolu University Journal of Education*, 8(2), s.68-75.
- Yeşilyurt, E. (2009). The views of students on the effect of cooperative learning on student behaviors *Firat University Journal of Social Science*, 19 ( 2), 161-178
- Yeşilyurt, E. (2010). Evaluation of the suitability of teacher candidates' qualities to cooperative learning method. *Dicle University Journal of Ziya Gökalp Faculty of Education*, 14 (2010), 25-37
- Yeşilyurt, E. (2011). An evaluation of the views of teacher candidates on the development of a constructivist learning based curriculum, *Turkish Studies*, 6/4 , 865-885
- Yildirim, A. (2003). Instructional planning in a centralized school system: lessons of a study among primary school teachers in Turkey. *International Review of Education*. 49(5), s.525-543.
- Zhao, Y., Zhang, M., Wang, S. and Chen, Y. (2005). Exploring constructivist learning theory and course visualization on computer graphics. [www.springerlink.com/content/p82hwjcd5b4wgvla/fulltext.pdf](http://www.springerlink.com/content/p82hwjcd5b4wgvla/fulltext.pdf)  
Erişim: 29.01.2009
- [http://physics.comu.edu.tr/etkinlikler/eg\\_yoo\\_d/bildiriler/cahit\\_kavcar.doc](http://physics.comu.edu.tr/etkinlikler/eg_yoo_d/bildiriler/cahit_kavcar.doc) : Restructuring of the Faculties of Education. KAVCAR, Cahit