Intel Teacher Program: Impact on Instructional Methods and Cognitive Levels of Learning in the Classroom

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Abstract

Research shows that using information and communication technologies (ICT) in the classroom affects the pedagogical methods used by teachers. Intel Teacher Program has been implemented in the same philosophy. This study examines whether attending the Intel Teacher Program, the extent of working experience, and gender affect (1) the instructional methods the instructor uses during the lessons and (2) the cognitive level of learning – according to Bloom's taxonomy – they emphasize during the lessons. A total of 267 teachers from 16 elementary and secondary schools in Bursa were surveyed. Several ANCOVA's were run where attending the Intel technology program, gender, and teaching experience were the independent variables and each instructional method was the dependent variable. Results show that gender, participation in the program, and working experience affects various instructional methods and cognitive levels of learning teachers emphasize. However, the program does not impact the results as expected.

Keywords

Intel technology program, working experience, gender, instructional method, cognitive level, Bloom's Taxonomy.

Introduction

The new primary and secondary school curriculum was organized in accordance with the educational trend called constructivist approach. Carrying the new approach into teaching and learning activities depends greatly on how far the teachers themselves could learn the new methods and techniques of this approach. MEB expects all teachers to apply the relevant methods and

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techniques to support the students' knowledge and skills on thinking, researching, problem solving, and discovering alternative ways so that students can construct their own learning (MEB, 2005).

MEB conducted in-service workshops for teachers to support them before and after the initiation of the new program. A great number of teachers have been trained in the in-service programs in this context. Some of these programs aim to introduce the new concept to the teachers while some others aim to encourage the teachers to use the new approach within their own teaching practices.

One of such programs executed in order to train the teachers is Intel Educational Program for Future. The name of the program, which was established in year 2003, has been changed to "Intel®Teacher Program" in 2007. The program has been implemented blended since 2008 whereas it was executed face to face till 2007. Implementation of the face-to-face mode has been terminated in 2010. More than 10 million teachers from 70 countries have attended the program. The number of teachers attending the Intel® Teacher Program in 2010 was 144. 370.

Intel® Teacher Program supports the teachers in their endeavour to integrate ICT into instruction. The overall goal of the program is to teach the new instructional approaches and methods to teachers in order for them to use technology effectively. The program also facilitates the teachers in handling class situations through a contemporary viewpoint.

European Commission, parallel to the goals of the Intel Teacher Program, emphasizes the potential of ICT in order to encourage new approaches and innovation in teaching and learning (European Commission, 2008). Research also indicates that using information and communication technologies (ICT) in the classroom affects the instructional methods employed by teachers (Law, Pelgrum & Plomp 2008).

Nevertheless the teachers' level of use of student-centered methods is not as much as what is expected of them. Many research done on the trends of instructional methods used by teachers in the classroom shows that the teachers still continue using teacher-centered approaches, which is obviously different than what was originally targeted (e.g., Aykaç, 2011; Aktepe & Aktepe, 2009; Taşkaya & Bal, 2009; Önen, Saka, Erdem, Uzal & Gürdal, 2008; Taşkaya & Muşta, 2008; Temizöz & Özgün -Koca, 2008; Çiçek -Akkuzu, 2006; Erdem, Uzal & Ersoy, 2006; Çakır, 2004; Doğan, 2004; Öztürk, 2004; Erdoğan, 2003; Yıldırım & Demir, 2003). Findings from other countries found in the relevant literature show parallel trends with the findings in Turkey (e.g., Bouluis & Voeten, 2001; Verloop, Driel, & Meijer, 2001).

It is clear from such results that the teachers need help for their professional development. It is also clear that the success of such programs depend on how the teachers practice what they learned from the program. That is why it is imperative to closely follow the developmental levels of teachers after such programs. Therefore, evaluating the teachers' status after such programs would, as well, have important implications for assessing the quality and effectiveness of the in-service programs themselves.

Within this framework, Önen et al. (2008) observed that the level of teachers' knowledge on instructional methods and techniques have significantly improved after the teachers attended such programs. Research conducted by Polat (2006) shows that the teachers' perception about use of different techniques on social sciences class has significantly changed after they attended the in-service training program. The teachers who attended the program thought that lecturing should be used less than the methods such as questioning-answering, problem solving, and presenting sample cases. It is not easy, on the other hand, to adapt what have been learned in the training programs.

Consequently, Polat (2006) observed that the trained teachers mostly differed on the practice of lecturing method. The trained teachers stated that they lecture less than before. Another research conducted by An, Wilder and Lim (2011) indicate that teachers who attended an online educational technology course developed technological and pedagogical content knowledge and therefore their beliefs and attitudes towards the applications of technology integration enhanced. But teachers could not succeed in implementing what they learned as much as they succeeded in the training program.

This study examines whether attending the Intel Teacher Program, the extent of working experience, and gender affect (1) the instructional methods the instructor uses during the lessons and (2) the cognitive level of learning – according to Bloom's taxonomy – they emphasize during the lessons.

Method

A survey was administered to 16 elementary and secondary schools in Bursa to collect data from teachers of several different majors. There were a total 267 teachers responding to the survey. The convenience sampling method was used to select the subjects based on the budget and availability. The survey questions were categorized under several topics such as self-efficacy in ICT, instructional techniques utilized in the classroom, emphasis on Bloom's Taxonomy categories, and Intel technology program.

Data Collection

This study utilized the 11 questions of the survey regarding the instructional methods and five questions on cognitive levels of Bloom's Taxonomy teachers emphasize during the lessons. An example question stem included "Considering the way you teach your lessons in general, how often do you perform the following instructional method?" An example item was "student presentations." The items were 4-point Likert scale ranging from 1="never" to 4="very often." The survey also inquired whether the teacher attended the Intel Technology Program, the teacher's gender and working experience in years.

Data Analysis

Several ANCOVA's were run where attending the Intel technology program, gender, and teaching experience were the independent variables and each instructional method was the dependent variable. Each level of learning was also entered into the consequent analyses as dependent variables. The teaching experience was considered as the covariate to control for the other independent variables.

Results

There were teachers in the study with a wide range of teaching experience. Table 1 shows the distribution of the participants based on their working experience, gender and whether they attended the Intel Teacher Program. Majority of the teachers had working experience ranging from 10 years to 30 years. Although the number of females participating in the program is higher than the males, percentage-wise more males (about 39%) participated in the Intel Teacher Program than females (about 34%).

Table 1. Participants of the study at a glance: Working experience by gender and participation in the Intel Teacher Program.

	Did not Participate in the Program			Participated in the Program			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Less than or equal to 10 years	9	26	35	8	16	24	17	42	59
More than 10 years, less than or equal to 20 years	13	57	70	12	16	28	25	73	98
More than 20 years, less than or equal to 30 years	29	21	50	10	20	30	39	41	80
More than 30 years	10	6	16	9	5	14	19	11	30
Total	61	110	171	39	57	96	100	167	267

Table 2 represents the mean scores of the responses to the survey questions based on program participation and gender. The most utilized method appears to be the hands on activities (m=3.21). The second favorite method was lecture (m=3.18). The least utilized method appears to be the online simulations and games (m=1.90). Except for online simulation/games, teachers in the Intel Teacher Program implemented all methods more than the others did. The most emphasized cognitive level emerges to be comprehension (m=3.16) while the least emphasized cognitive level is analysis (m=2.82) according to the Bloom's Taxonomy. In most occasions, females marked higher scores in comparison to males.

Table 2. Dependent variables by gender and participation in the Intel Teacher Program.

		Did not Participate in the Program			*Participated in the Program*			*Total*		
		Male	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
Instructional Methods										
Demonstration	M	2.98	3.20	3.12	2.89	3.27	3.10	2.94	3.22	3.11
	SD	(.77)	(.75)	(.76)	(.87)	(.82)	(.86)	(.81)	(.77)	(.80)
Hands on activities	M	3.11	3.25	3.20	3.14	3.27	3.21	3.12	3.26	3.21
	SD	(.77)	(.73)	(.74)	(.76)	(.69)	(.72)	(.76)	(.72)	(.73)
Individual study	M	2.93	2.85	2.88	2.75	3.07	2.93	2.85	2.93	2.90
	SD	(.82)	(.81)	(.81)	(.69)	(.76)	(.74)	(.76)	(.79)	(.78)
Lecture	M	3.02	3.11	3.08	3.31	3.39	3.35	3.15	3.21	3.18
	SD	(.88)	(.89)	(.89)	(.71)	(.72)	(.71)	(.82)	(.85)	(.83)
Online simulations/games	M	1.85	1.99	1.94	2.09	1.63	1.84	1.96	1.86	1.90
	SD	(.88)	(.91)	(.90)	(.72)	(.92)	(.86)	(.82)	(.92)	(.88)
Homework review	M	2.82	3.00	2.94	2.77	3.02	2.91	2.80	3.01	2.93
	SD	(.84)	(.81)	(.82)	(.77)	(.94)	(.87)	(.81)	(.85)	(.84)
Test review	M	2.86	2.77	2.80	2.97	2.83	2.89	2.91	2.79	2.84
	SD	(.87)	(.86)	(.86)	(.81)	(.97)	(.90)	(.84)	(.90)	(.88)
Small group work	M	2.49	2.59	2.56	2.55	2.66	2.61	2.51	2.61	2.58
	SD	(.82)	(.75)	(.78)	(.62)	(.69)	(.66)	(.73)	(.73)	(.73)
Student presentations	M	2.47	2.54	2.52	2.56	2.69	2.64	2.51	2.59	2.56
	SD	(.97)	(.78)	(.85)	(.80)	(.90)	(.85)	(.90)	(.82)	(.85)
Exams and tests	M	2.60	2.54	2.56	2.97	2.83	2.89	2.76	2.64	2.69
	SD	(.80)	(.92)	(.88)	(.77)	(.85)	(.81)	(.80)	(.91)	(.87)

Table 2. Cont.

Whole class discussion	M	2.74	2.82	2.79	2.88	2.95	2.92	2.80	2.86	2.84
	SD	(.90)	(.89)	(.89)	(.78)	(.95)	(.87)	(.85)	(.91)	(.88)
Bloom's Taxonomy Categories										
Knowledge	M	2.96	3.15	3.08	2.92	3.33	3.15	2.94	3.22	3.11
	SD	(.79)	(.70)	(.74)	(.64)	(.69)	(.69)	(.73)	(.70)	(.72)
Comprehension	M	2.94	3.29	3.16	3.00	3.26	3.15	2.96	3.28	3.16
	SD	(.72)	(.65)	(.70)	(.59)	(.66)	(.64)	(.66)	(.66)	(.67)
Application	M	2.94	3.10	3.04	3.05	3.17	3.12	2.99	3.12	3.07
	SD	(.85)	(.71)	(.77)	(.62)	(.66)	(.64)	(.76)	(.69)	(.72)
Analysis	M	2.62	2.83	2.76	2.80	3.00	2.92	2.70	2.89	2.82
	SD	(.82)	(.76)	(.79)	(.83)	(.64)	(.73)	(.82)	(.72)	(.77)
Synthesis	M	2.63	2.94	2.83	2.81	2.98	2.91	2.71	2.95	2.86
	SD	(.76)	(.73)	(.76)	(.66)	(.63)	(.64)	(.72)	(.69)	(.71)

Table 3 shows how the scores change as the working experience change. The scores tend to drop slightly as the working experience increases, but there are exceptions to this generalization. In both Table 2 and Table 3, except for the online simulations and games, the scores in general are above the mid point. That is the teachers used most techniques more than average. However, teachers with less than or equal to 10 years of working experience scored higher in hands on activities, individual study, and small group work in comparison to the others. It is possible to speculate that recent graduates apply the constructivist principles more than the others.

Table 3. Dependent variables by teachers' working experience.

		Working Experience			
		Less than or equal to 10 years	*More than 10 years. less than or equal to 20 years*	*More than 20 years. less than or equal to 30 years*	*More than 30 years*
Instructional Methods					
Demonstration	M	3.23	3.12	3.05	3.00
	SD	(.73)	(.87)	(.79)	(.73)
Hands on activities	M	3.37	3.17	3.09	3.30
	SD	(.73)	(.79)	(.68)	(.66)
Individual study	M	3.13	2.88	2.81	2.70
	SD	(.69)	(.80)	(.81)	(.73)
Lecture	M	3.17	3.20	3.17	3.21
	SD	(.86)	(.85)	(.85)	(.71)
Online simulations/games	M	1.84	1.76	2.07	2.00
	SD	(.81)	(.88)	(.93)	(.82)
Homework review	M	2.80	2.97	2.89	3.17
	SD	(.76)	(.85)	(.87)	(.86)
Test review	M	2.68	2.90	2.80	3.11
	SD	(.83)	(.83)	(1.00)	(.74)
Small group work	M	2.69	2.61	2.50	2.40
	SD	(.73)	(.71)	(.70)	(.88)
Student presentations	M	2.38	2.68	2.48	2.80
	SD	(.78)	(.82)	(.88)	(.95)
Exams and tests	M	2.62	2.59	2.75	3.00
	SD	(.86)	(.86)	(.87)	(.88)

Table 3. Cont.

Whole class discussion	M	2.81	2.83	2.82	3.00
	SD	(.88)	(.96)	(.79)	(.97)
Bloom's Taxonomy Categories					
Knowledge	M	3.22	3.15	3.03	2.95
	SD	(.71)	(.65)	(.78)	(.80)
Comprehension	M	3.20	3.20	3.06	3.20
	SD	(.70)	(.58)	(.73)	(.77)
Application	M	3.04	3.10	3.05	3.10
	SD	(.70)	(.68)	(.77)	(.79)
Analysis	M	2.86	2.86	2.78	2.71
	SD	(.78)	(.72)	(.85)	(.64)
Synthesis	M	2.86	2.94	2.79	2.76
	SD	(.74)	(.68)	(.75)	(.70)

Table 4 summarizes the analysis results in terms of the significant relationships between the dependent variables and the independent variables. For the cells marked with X, the score of the dependent variable was significantly affected by the corresponding independent variable. *df*, *F* and p values are the values of the single independent variable in the respective row. Table 4 can be interpreted better in connection with Table 1 and Table 3. For example, gender appears to significantly affect the demonstration scores. In Table 1, it can be seen that females' mean scores are higher than males'. That is, females perceived that they more frequently used the demonstration technique than males did.

Table 4. Summary of the ANCOVA results.

	Independent Variables					
Dependent variables	***Gender***	***Participation in the Program***	***Working Experience***	***df***	***F***	***p***
Instructional Methods						
Demonstration	X			1, 206	4851	.03
Hands on activities						
Individual study			X	1, 205	5218	.02
Lecture		X		1, 207	5368	.02
Online simulations/games	*	*		1, 188	5201	.02
Homework review	X			1, 200	4388	.04
Test review						
Small group work						
Student presentations						
Exams and tests		X		1, 195	6627	.01
Whole class work						
Bloom's Taxonomy Categories						
Knowledge	X			1, 219	6916	.01
Comprehension	X			1, 218	10317	.01
Application						
Analysis						
Synthesis	X			1, 218	5055	.03

X shows independent variables that have a main effect, * shows the independent variables that have an interaction effect on the corresponding dependent variable.

Results also show that working experience affects only the individual student work the teachers emphasize in the classroom. As the working experience increased, the teacher implemented lesser and lesser individual student work. Use of the several of the instructional methods and emphasis on most of the learning levels were dependent on gender. Females thought they more frequently performed demonstrations and reviewed homework. They also thought they more frequently

emphasized memorizing information, understanding relationships, and synthesizing information according to Bloom's taxonomies. It is interesting that on all the relationships turning out to be significant, female teachers marked higher scores than males did. Regarding the Intel Teacher Program, the teachers who attended the program have utilized the lecture and the testing techniques – as instructional activities – significantly more often than the other teachers. Also there was an interaction effect between gender and attending the program. Male teachers who attended the Intel Teacher Program scored higher than the female teachers who attended the Intel Teacher Program.

Discussion

The results imply that the Intel Teacher Program does not impact the subjects of this study in the desired direction in terms of the implemented instructional methods. The idea might exist in belief (An, Wilder, & Lim, 2011) but it does not appear to exist in practice. Parallel to the constructivist learning principles, one would expect teachers to implement more individual student work, student presentations, teamwork, and hands on activities, for example, if they attended the program. To the contrary, the teachers of the program utilized more lectures, and more tests and exams.

Regarding the effect of gender, there does not seem to be an apparent pattern on why females think they perform some of the instructional methods more frequently than males do; however, females always appear to feel they perform more frequently. This might be as a result of females' emotional human beings or their approach to some of the social issues. Or, females might in fact be performing this way. It would not be possible to prove this without more direct measures of the lessons. This study relied on the teachers' perceptions. The results conflict with Erdem et al.'s (2006) study in which they found that instructional techniques used by the teachers did not vary as a result of department or gender. Today as the Turkish Ministry of National Education promotes constructivist learning principles, higher levels of learning in Bloom's taxonomy gains more and more importance. Gender to some extent affects the way teachers conduct their instruction. Although females appear to emphasize more the highest level of learning (synthesizing), the middle levels of Bloom's taxonomy were not different for males and females.

In the current study, through the descriptive statistics, it is possible to say that teachers who participated in the Intel Teacher Program used most of the techniques more often than the other teachers did. As the working experience increased, individual study and small group work ceased. In this perspective, teachers with less than 10 years of working experience utilized the respective instructional techniques more often than the others. Although the results were significant only for individual study, it can be said that teachers who utilize these techniques more frequently would have relevant experience and would be knowledgeable on those techniques. Önen et al. (2008) found that teachers who have less working experience responded to instructional methods- and techniques-related questions more acceptably than the teachers with more working experience. The higher the experience, the lesser the connections they could make between the questions and the instructional techniques. Similarly, Erem et al. (2006) indicate that the level of use of instructional techniques vary depending on the level of working experience.

There are various findings in the literature regarding the instructional methods teachers implement. Besides the individual- and job-related characteristics, the lack of physical resources at schools, lack of course hours to cover the curriculum, and abundance of students in the classrooms are some of

such reasons teachers have when they are asked to justify why they still use traditional teaching techniques (Çakır, 2004). According to Temizöz and Özgün-Koca (2008) teachers believe in the benefit of discovery learning, but because of lack of time and intensity of the curriculum, they do not consider applying such methods to be feasible. It is also important to count the teacher perceptions when talking about the instructional methods teachers implement. Although the Intel Teacher Program – carried out in this perspective – has begun in 2003, it took until 2005 before the program could be adapted into the curriculum, which was reconstructed in the light of the new educational perspective. Therefore, it would be necessary to evaluate the in-service training program in this context. Gerges (2001) show that methodological diversity depends on topic and pedagogical content knowledge. Akbaba-Altun (2006) and Karaman and Kurfallı (2008) indicate that teachers emphasize the inefficiency of the in-service training they received. They complain that the trainers were not experts and the training itself was not tailored to their needs and competencies. Moreover, they complain about the lack of practice and if practice existed, it was not appropriate for the superintendent and teachers. It is important to note when – at what portion of the academic year – the teachers were trained, in order to comprehend the implications, but Akbaba-Altun (2006) and Karaman and Kurfallı (2008) do not speculate on those implications. Gözütok, Akgün, and Karacaoğlu (2005) criticize that the training program given for two weeks is not enough for the teachers who implement the new elementary and secondary school curriculum in the pilot schools. Similarly, Parlak-Yılmaz and Öncü (2012) indicate that teachers felt they could not benefit from the Intel Teacher Program because of the insufficient training time.

Conclusion

All in all, the results of this study were not able to link the Intel Teacher Program with constructivist teaching principles. Although classroom practices such as teamwork, student presentations, hands on activities are supposed to be encouraged because of constructivist learning, the results do not show a direct link between such activities and Intel Teacher Program. Less-experienced teachers have a tendency to apply those principles more frequently. Contrary to some literature, however, gender is an important determinant on many of the teaching practices and teaching directions. Females are not necessarily applying more constructivist approaches; in other words, they feel they apply more of everything. So, it appears, teachers of both gender and with more teaching experience still need more support if the program is to have an impact on instructional methods and learning levels.

The current study did not detect an impact on the instructional techniques as expected. Some of the above limitations could all have contributed to the results that were obtained from the current study, but lack of training time appears to be a prominent suspect. Future studies can elaborate on the training time associated with the program.

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References

Akbaba-Altun, S. (2006). Complexity of integration computer technologies into education in Turkey. *Educational Technology & Society* , 9 (1), 176-187.

Aktepe, V. & Aktepe, L. (2009). Fen ve Teknoloji Öğretiminde Kullanılan Öğretim Yöntemlerine İlişkin Öğrenci Görüşleri: Kırşehir BİLSEM Örneği. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi (KEFAD),* 10(1), 69 -80.

Aykaç, N. (2011). Hayat Bilgisi Dersi Öğretim Programında Kullanılan Yöntem Ve Tekniklerin Öğretmen Görüşlerine Göre Değerlendirilmesi (Sinop İli Örneği). ***Kastamonu Eğitim Dergisi, 19 (1), 113 -126.***

An, H., Wilder, H. & Lim, K. (2011). Preparing elementary pre-service teachers from a non-traditional student population to teach with technology. *Computers in the Schools, 28*(2), 170-193

Bayrakçı, M. & Süngü, H. (5 -7 Eylül 2007). Öğretmenlerin hizmet-içi eğitiminde interaktif uygulamalar: Japonya ve Türkiye örnekleri. XVI. Ulusal Eğitim Bilimleri Kongresi'nde sunulan bildiri. Tokat: Gaziosmanpaşa Üniversitesi Eğitim Fakültesi.

Bolhuis, S. & Voeten, M.J. M. (2001). Toward self-directed learning in secondary schools: what do teachers do?. *Teaching and Teacher Education*, 17, 837–855.

Çakır, R. (2004). Coğrafya öğretmenlerinin kullandıkları teknik ve yöntemlerin lise coğrafya dersleri öğretiminin verimi üzerindeki etkileri. *Yayımlanmamış Yüksek Lisans Tezi*, İstanbul: Marmara Üniversitesi Eğitim Bilimleri Enstitüsü.

Çelikkaya, T. & Kuş, Z. (2009). Sosyal Bilgiler öğretmenlerinin kullandıkları yöntem ve teknikler. *Uludağ Üniversitesi Eğitim Fakültesi Dergisi,* 22 (2), 741 -758.

Çiçek -Akkuzu, Z. (2006). Genel lise matematik derslerindeki öğrenme ve öğretme süreçlerinin belirlenmesi üzerine nitel bir çalışma. *Yayımlanmamış Yüksek Lisans Tezi*, Ankara: Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü.

Doğan, C. (2004). Sınıf öğretmenlerinin derslere ilişkin görüşleri ve tercih ettikleri öğretim yöntemleri: İstanbul örneği. *Türk Eğitim Bilimleri Dergisi*, 2(2), 193 -203.

Erdem, A., Uzal, G. & Ersoy, Y. (2006). Fen Bilgisi/Fizik öğretmenlerinin eğitim sorunları: Gelişmeleri sürekli izlemeleri ve gerekli yenilikleri edinmeleri, *Araştırma Raporu*, Tekirdağ: TFV Yayını.

Erdoğan, Z. (2003). Fen bilgisi öğretiminde, öğretmenlerin kullandıkları öğretim yöntemlerinin incelenmesi. *Yayımlanmamış Yüksek Lisans Tezi*, Ankara: Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü.

European Commission, (2008c). *Commission Staff Working Document on The use of ICT to support innovation and lifelong learning for all – A report on progress*. SEC(2008) 2629 final.

Gerges, G. (2001). Factors influencing preservice teachers' variation in use of instructional methods: Why is teacher efficacy not a significant contributor?. *Teacher Education Quarterly, 28*(4), 71-88

Gözütok, D. F., Akgün, Ö. E., & Karacaoğlu, Ö. C. (2005). İlköğretim programlarının öğretmen yeterlikleri açısından değerlendirilmesi. *Eğitimde yansımalar: VIII. Yeni İlköğretim Programlarını Değerlendirme Sempozyumu (14 -16 Kasım*), 17-40, Kayseri: Erciyes Üniversitesi.

Karaman, M. K. & Kurfallı, H. (2008). Sınıf öğretmenlerinin bilgi ve iletişim teknolojilerini öğretim amaçlı kullanım düzeyleri, *Kuramsal Eğitimbilim,*1(2), 43-56.

Korkmaz, Ö. & Demir, B. (2012). MEB hizmetiçi eğitimlerinin öğretmenlerin bilgi ve İletişim teknolojilerine ilişkin tutumlarına ve bilgisayar öz-yeterliklerine etkisi. *Eğitim Teknolojisi Kuram Ve Uygulama*, 2(1),

Law, N., Pelgrum, W.J., & Plomp, T. (Eds.). (2008). *Pedagogy and ICT use in schools around the world: Findings from the IEA SITES 2006 study*. Hong Kong: CERC-Springer.

MEB (2008). İlköğretim Bilişim Teknolojileri Öğretmen Kılavuz Kitabı. Ankara: MEB Yay.

Önen, F., Saka, M., Erdem, A., Uzal, G. & Gürdal, A. (2008). Hizmet İçi Eğitime Katılan Fen Bilgisi Öğretmenlerinin Öğretim Tekniklerine İlişkin Bilgilerindeki Değişimin Tesbiti: Tekirdağ Örneği. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi (KEFAD*) 9(1), 45-57.

Öztürk Ç. (2004). Ortaöğretim Coğrafya Öğretmenlerinin Öğretim Yöntem Ve Teknikleri Kullanabilme Yeterlilikleri. *Gazi Üniversitesi Kırşehir Eğitim Fakültesi*, 5(2), 75 -83.

Parlak-Yılmaz, N & Öncü, S. (13 -15 September 2012). The Relationship between Teachers' Self-efficacy and Information and Communication Technology Use: Does Knowing Translate into Using. Paper presented Applied Education Congress, Ankara: ODTÜ, Turkey.

Polat, F. (2006). İlköğretim 7. sınıf sosyal bilgiler öğretiminde öğretmenlerin kullandıkları yöntemler ve karşılaştıkları sorunlar (Afyonkarahisar Örneği). *Yayımlanmamış Yüksek Lisans Tezi*, Ankara: Gazi Üniversitesi.

Taşkaya, S. M. & Muşta, M. C. (2008). Sınıf öğretmenlerinin Türkçe öğretim yöntemlerine ilişkin görüşleri. *Elektronik Sosyal Bilimler Dergisi*, 7 (25), 240 -251.

Taşkaya, S. M. & Bal, T. (2009). Sınıf öğretmenlerinin sosyal bilgiler öğretim yöntemlerine ilişkin görüşleri. *Selçuk Üniversitesi Ahmet Keleşoğlu Eğitim Fakültesi Dergisi*, Sayı 27, Sayfa 173 -185.

Temizöz, Y. & Özgün-Koca, S. A. (2008). Matematik öğretmenlerinin kullandıkları öğretim yöntemleri ve buluş yoluyla öğrenme yaklaşımı konusundaki görüşleri. *Eğitim ve Bilim*, 33 (149), 89 -103.

Verloop, N. Jan Van Driel, J. V. & Meijer, P. (2001). Teacher knowledge and the knowledge base of Teaching. *International Journal of Educational Research*, 35, 441–461.

Yıldırım, Z. & Demir, K. (2003). Burdur il merkezindeki ilköğretim okullarında görev yapan fen bilgisi öğretmenlerinin alanları ve yeterliliklerine ilişkin görüşleri ile fen bilgisi eğitimi öğrencilerinin bu öğretmenler ile ilgili gözlemleri. *Sakarya Üniversitesi Eğitim Fakültesi Dergisi*, 4, 134-145.