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Full Length Research Paper

The Turkish geography teaching program (2005) and technology use in Geography courses: An overview of high school teachers' approach

Süleyman Incekara

Department of Geography, Arts and Science Faculty, Fatih University, Istanbul, 34500, Turkey.
E-mail: sincekara@fatih.edu.tr.

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This study aims at assessing the importance and use of technology in geography courses, what the 2005 geography teaching program changed in terms of technology and some of the factors preventing the effective use of technology from teachers' perspectives. The research outcomes suggested that, despite the fact that there is a common consensus among geography teachers that the use of technology is highly beneficial for teaching and learning processes and the use of technology must be maximized for ideal geography education, there are some gaps that must be addressed by all shareholders in geography education; about half of the respondents suffer from a lack of technological infrastructure in their schools and almost one-third of them disagree with or are noncommittal about the suggestion that they have enough knowledge to integrate the necessary competences in the use of technology. The results indicated however, that the 2005 program affected geography education in a positive way, by encouraging the use of technology in geography courses especially in the public schools. Additionally, increasing English level of the teachers also affects their beliefs about the importance of technology use in geography courses and their competence in using technology in an affirmative way.

Key words: Geography teaching program, technology use, high school geography, geography teachers.

INTRODUCTION

Rapid and vast expansion of various technologies in the teaching and learning of geography throughout the world is evident. Kent emphasized how rapidly, information and communication technologies (ICTs) have developed and been incorporated by education in the last few decades and will probably develop at the same speed in the coming decades (Kent, 2003: 337-340). Prensky assessed the use of technology in education from a student's perspective and called the new generation "digital natives," that is those who were born in a digital age amid technologies including digital games, email, internet, cell phones and many others which are fundamental to their lives. He also called "digital immigrants" those who were not born in the digital world but to some extent have adapted to these technologies. He emphasized the difficulties of teaching such a generation of "digital natives" and underlined the importance of maximizing the adaptation of technologies into education as "digital immigrants" (Prensky, 2001: 1-2).

Moreover, Van Der Schee stated that although the accessibility of the new technologies in geography teaching has increased and many governments are trying to incorporate them in education, there are still many areas of the globe which do not accept digital literacy (Van Der Schee, 2006: 190). Concerning the use of technology in geography in Turkey; Doğanay reported that the technology provided by the National Ministry of Education is not sufficient to realize the objectives of geography education and for ideal geography teaching and learning, the full integration of educational technologies must be implemented (Doğanay, 2002:193). As regards the benefits of using technology in education, many studies have noted that it:

1. Provides an active learning environment (Ateş, 2010:

409; Smeets, 2005: 343; Jonassen et al., 1998: 30; Keeler, 1996: 329-331);
2. Increases learning, teaching, student success, student inquiry, critical thinking, motivation, and problem-solving (Lambert and Balderstone, 2000: 148-149; Rüzgar, 2005: 114; Scheffler and Logan, 1999: 305-310; Susskind, 2005: 203; Fitzpatrick, 1993: 156; Demirci et al., 2007: 38-39; Muir-Herzig, 2004: 111; Nellis, 1994: 36-37; Demiralp, 2007: 374; Hassell, 2000: 81; Hassell, 2002: 149),
3. Has a positive effect on the cognitive attitudes towards the courses (Waxman et al., 2003: 1)
4. Provides student-centered education (Scheffler and Logan, 1999: 305-310; Smeets, 2005: 343-345), and
5. Changes the role of teachers and students in classrooms (Dooley, 1999; Ruthven et al., 2005: 2-3; Seal and Przasnyski, 2001: 33-34).

Many barriers impeding the effective use of technology in the classes were also determined; however, including the lack of physical infrastructure, unreliability of technology, inadequate technical support, negative attitudes of some teachers to technology, lack of computer skills, etc. (Zhang, 2007: 301-303; Hew and Brush, 2007: 223; Keengwe and Onchwari, 2008: 560; Unwin and Maguire, 1990: 77-78).

Background

The whole Turkish education system has been undergoing reform since 2002; the secondary geography curriculum was radically revised by the Ministry of National Education, the changes taking effect in the academic year 2005 to 2006. The new curriculum introduced in 2005 brought about important changes in organization and content, teaching methods, teaching hours, and educational technology based on a constructivist approach. The geography program of 2005 emphasizes the adoption of technology (İncekara, 2010: 553; Demiralp, 2007: 376; İncekara, 2007: 123). As a result of these developments, many studies have been conducted on technology in geography curricula and in the classroom environment. In this context however, we must ask three critical questions:

1. Do we (instructors and students) have enough skills to use that technology?
2. Does the use of this technology improve teaching and learning? and
3. To what extent do developing countries have a chance of taking advantage of such technology? (Houtsonen, 2003: 47).

A few more questions also arise if we are to understand the place of technology use in geography courses, especially in a fast developing country such as Turkey:

1. Do the geography curriculums encourage technology use?
2. Does the physical infrastructure of schools allow the maximum use of technology?

The Turkish literature partially answers these questions. For instance, Özel stated that social studies and geography teachers did not use educational technologies in their activities very often, and they self-reported that, they were partially adequate in using these technologies. He also found that most teachers use educational technologies including computers, VCD players, and multimedia projector in just a few lessons a week (Özel, 2007: 3228). Another study on teacher approaches to new technologies revealed that up-to-date technologies such as LCD projectors and computers have already replaced old ones; however, most of these educational technologies were not available in their schools (Demirci, 2009: 48). Some other studies also indicated that, the lack of educational technology in schools has a negative impact on the teaching of geography and suggested the maximum technology adoption in service training for geography teachers because most of the technology is unknown to them (Sönmez et al., 2009: 213; Demirci et al., 2007: 38). In a study on the attitudes of geography teachers to technology, it was revealed that the teachers are aware of the importance of educational technologies but have not been able to apply these technologies to their courses (Taş et al., 2007: 31). Yaşar and Şeremet found that, in higher education, the instructor tends to use visual course materials frequently (Yaşar and Seremet, 2010: 675).

METHODS AND PURPOSE

It is clear that geography teachers are at the center of the issue of adopting technology, since it cannot be isolated from the requirements imposed on them. It has to be asked:

1. Whether they believe in the benefits of using technology in their courses;
2. Whether they have learned how to conduct this technology in their courses;
3. Whether they have enough knowledge and skills for pedagogical use of this technology;
4. Whether they have established their own teaching models and methods by using technology;
5. Whether they have been provided with the necessary technology in their schools and whether the curriculum supports the full use of technology in their courses (Houtsonen, 2003: 47; Van der Schee, 2006: 188; Van der Schee, 2003: 209; Kent, 2003: 341; Gersmehl, 2008: 138) and
6. Whether the incorporation of technology by teachers is affected by demographic features including gender, age, professional experience, working conditions, degree held, and English language competence.

Data collection and analysis

Based on the aforestated issues, which also constitute the research goals of this study, a 14-item “Technology in geography education”

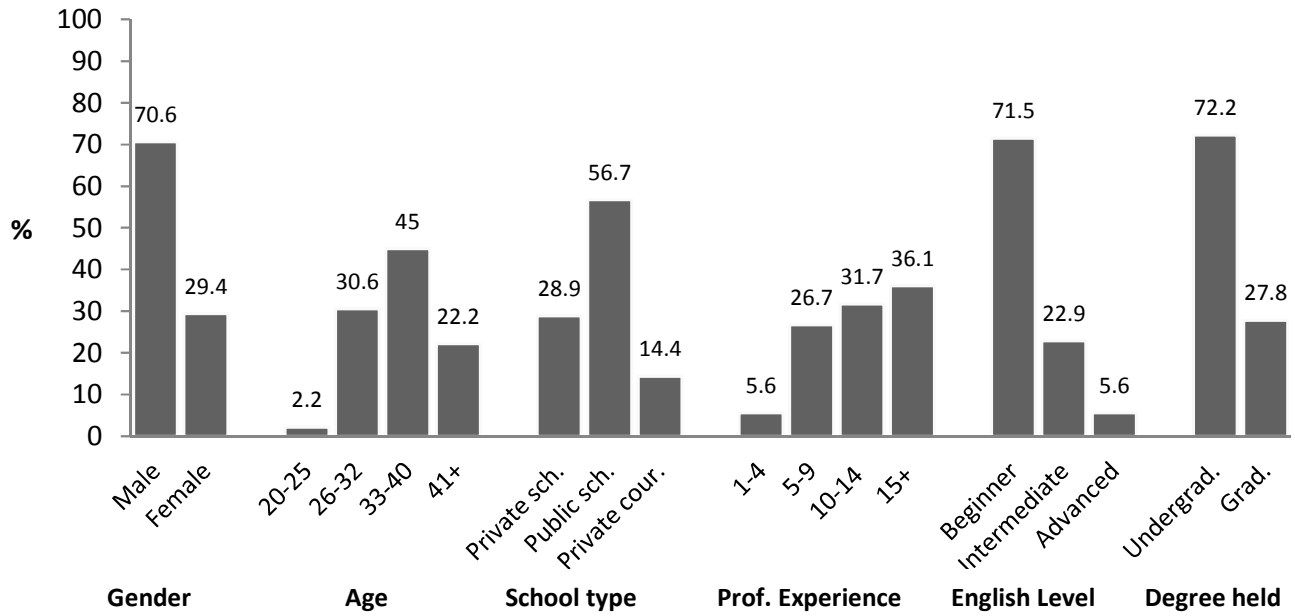

Figure 1. Distribution of teachers by gender, age, school type, professional experience, English level, and degree held.

questionnaire was prepared and distributed to 180 geography teachers working in 48 different provinces of Turkey who voluntarily agreed to participate. The questionnaire was developed in three parts:

1. Demographic questions: This section was designed to elicit inter alia the gender and age of the respondents;
2. Questions oriented to the profession: This part included items regarding the school type (public schools, private schools, and private courses) the province, professional experience, weekly work load, class size, educational level, and the level of foreign language (English) of the teachers. Private courses are the educational institutions preparing students for different exams, including university and high school entrance exams;
3. Statement section: This section was designed to investigate the approach of geography teachers to use of technology in their courses.

Five questions asked the respondents about the place of technology in the 2005 geography course teaching program, the use of technology in their course, whether they believed in the benefits of using technology in their courses, whether the physical infrastructure of schools is a barrier to the effective use of technology, and the skills of incorporating the technology into a class environment. The questions were on a five-point Likert scale (1 = “Strongly disagree,” 2 = “Disagree,” 3 = “Neutral,” 4 = “Agree,” 5 = “Strongly agree”). In this study, in addition to the descriptive statistics which were used to analyze the demographic data, the statistically significant differences between the independent (gender, age, school type, professional experience, degree held, and English level of the respondents) and dependent variables (attendance level points of the respondents regarding the given statements) were investigated. The reliability coefficient was 54.4% based on the factor reliability analysis (Cronbach’s alpha coefficient: 0.544). Since the data did not have a normally distributed interval variable ($p<0.005$) based on a one-sample Kolmogorow-Smirnov test, nonparametric tests such as Mann-Whitney U and Kruskal-Wallis H were used for the inferential statistics throughout the study.

FINDINGS

According to the demographic analysis of the data, the majority of the teachers were male (70.6%, n=127) and 29.4% of them (n=53) female (out of 180 teachers). 45% of the teachers were between 33 and 40 years of age, and 30.6% of them were between 26 and 32 years old (22.2%: 41+, 2.2%: 20 to 25). More than half of the respondents were employed in public schools (56.7%, n=102), 28.2% worked in private schools (n=52), and the remaining 26 teachers were employed to teach private courses (14.4%). As regards professional experience, they were quite experienced in that, almost 68% of the participants had more than 10 years of professional experience as geography teachers (36.1%: 15+, 31.7%: 10 to 14). More than 70% of the teachers were beginners in terms of English level and the remaining 28.5% were either intermediate level (22.9%) or advanced (5.6%). A large majority of the geography teachers (72.2%) had an undergraduate degree and the rest had graduate degrees (27.8%) (Figure 1).

In the second part of the survey, respondents were provided with five statements regarding the 2005 geography course teaching program and technology use, teachers and use of technology, the necessity of technology use in geography courses, limited infrastructure of schools impeding use of technology, and teaching skills required for using technology in the courses (Table 1). According to the analysis of the teachers’ agreement with the given statements, a large majority of teachers agreed or strongly agreed that, the geography program of 2005 supports the greater use of technology in geography education (84.4%). Similarly,

Table 1. Opinions of geography teachers about the use of technology in geography education.

Statements			Level of agreement			
			Strongly disagree/ Disagree 1/2*	Neutral 3*	Agree/ Strongly agree 4/5*	Total
1	The 2005 geography teaching program supports the greater use of technology	n	12	16	152	180
		%	6.7	8.9	84.4	100
2	I utilize the technology more in my courses with the 2005 geography teaching program	n	17	18	145	180
		%	9.5	10	80.5	100
3	Technology must be used for ideal geography teaching	n	12	8	160	180
		%	6.7	4.4	88.9	100
4	The limited facilities of the school prevent me from using technology sufficiently	n	68	22	89	179
		%	37.9	12.3	49.7	100
5	I have enough knowledge about how to incorporate technology into my courses	n	29	29	120	178
		%	16.3	16.3	67.4	100

*1: Strongly disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly agree

slightly more than 80% of the respondents stated that, after the initiation of the 2005 program, they had started to use technology more than before. It is very encouraging that almost 90% of geography teachers recognize the importance of educational technologies in an ideal geography course. Almost half of them, however, stated that the limited facilities of their school prevent debar adequate use of technology in their courses. Slightly more than 67% of them indicated that, they have enough knowledge of how to incorporate technology into their courses (Table 1). If we look at the mean scores of the teachers' agreement levels, we see that the score corresponds to "Agree" or respondents agreed to all statements except for the fourth one, which is "The limited facilities of the school prevent me from using technology sufficiently." Therefore, according to the mean scores of this statement, the teachers remained neutral in response to it (Figure 2). The average score, 3.86 out of 5, corresponds to "Agree," to investigate the significance between the gender and age of the respondents and their statements Mann-Whitney U tests were performed. Results indicated that there were no significant differences between these dependent and independent variables ($p<0.005$). Kruskal-Wallis tests revealed, however, that there were statistically significant differences among the three school types in Statements 1, 2, 3, and 4 (Table 2).

Three post hoc Mann-Whitney tests compared which pairs of school types were significantly differentiated on the first, second, third, and fourth statements. The outcomes indicated that there was a significant difference in Statement 1 between the public schools and private schools and between the public schools and private courses. According to the statistics, the mean ranking of geography teachers employed in public schools (82.70, n=102) was significantly higher than those employed in private schools (67.30, n=52) for Statement 1 (z= -2.205, p=0.27). Also, the mean rankings of teachers employed in public schools (69.64, n=102) was higher for the first statement than those of teachers employed in private courses (44.33, n=26) (z= -3.371, p=0.001). A hundred and two public school teachers had higher means on the second (69.68) and third statements (67.66) than did 26 private course teachers (44.17, 52.10) (z= -3.413 and p=0.001 for Statement 2 and z= -2.183 and p=0.029 for Statement 3). Additionally, 102 public school teachers and 26 private course teachers had significantly higher mean rankings (87.75 and 46.90) on the fourth statement than did teachers employed in private schools (55.49, 34.97) (z= -4.370

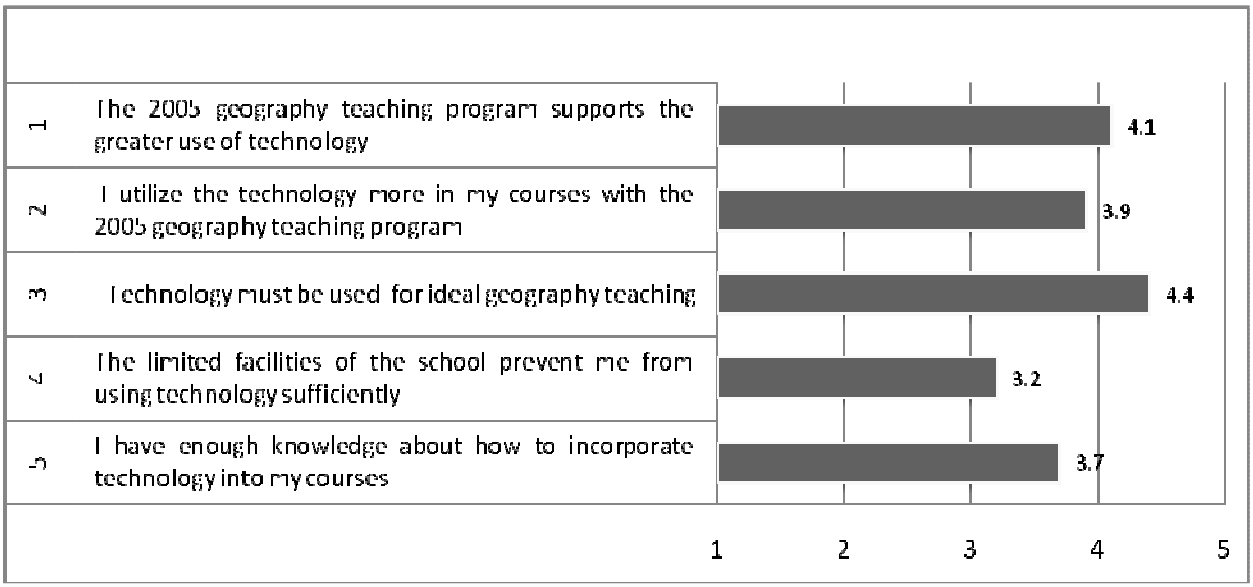

Figure 2. Geography teachers' level of agreement on the use of technologies in geography education.

Table 2. Kruskal-Wallis H test results for statements of teachers about technology based on "type of school."

Statements*	School type	N	Mean ranking	df	X^2	p
1	Private schools	52	82.97	2	13.464	0.001
	Public schools	102	100.84			
	Private courses	26	64.98			
2	Private schools	52	85.66	2	12.080	0.002
	Public schools	102	99.66			
	Private courses	26	64.23			
3	Private schools	52	83.75	2	6.082	0.048
	Public schools	102	97.63			
	Private courses	26	76.02			
4	Private schools	51	64.46	2	20.412	0.000
	Public schools	102	103.39			
	Private courses	26	87.58			

*See Table 1 for statements.

and p=0.000 in the private school and public school comparison and z= -2.303 and p=0.021 in the private school and private courses comparison) (Table 3).

Other Kruskal-Wallis analysis of variances did not indicate statistically significant differences between the professional experience of the teachers and the level of agreement but there was a significant difference between the English level of the teachers on the third ("Technology must be used for ideal geography teaching") and fifth ("I have enough knowledge about how to incorporate technology into my courses") statements (Table 4). Three post hoc Mann-Whitney U tests were performed to investigate which of the English levels had significantly different means for the third and the fifth statements. The outcomes suggested that, 41 teachers at intermediate and 10 teachers at advanced English level had significantly higher mean rankings (102.40 and 97.50) on Statement 3 than teachers with beginner level English (79.43 and 67.31, n=128) (z= -2.920 and p=0.004 in the intermediate-beginner comparison and z= -2537, p=0.011 for advanced-beginner comparison). In addition, the mean rankings of intermediate and advanced level

Table 3. Post hoc Mann-Whitney U test comparing three school types employing geography teachers for Statements 1, 2, 3, and 4.

Statements	School type	N	Mean ranking	Sum of rankings	U	Z	p
1	Private school	52	67.30	3499.50	2121.500	-2.205	0.027
	Public schools	102	82.70	8435.50			
	Public school	102	69.64	7103.50	801.500	-3.371	0.001
	Private courses	26	44.33	1152.50			
2	Public school	102	69.68	7107.50	797.500	-3.413	0.001
	Private courses	26	44.17	1148.50			
3	Public school	102	67.66	6901.50	1003.500	-2.183	0.029
	Private courses	26	52.10	1354.50			
4	Private school	51	55.49	2830.00	1504.000	-4.370	0.000
	Public school	102	87.75	8951.00			
	Private school	51	34.97	1783.50	457.500	-2.303	0.021
	Private courses	26	46.90	1219.50			

*See Table 1 for statements.

Table 4. Kruskal-Wallis H test results for statements of teachers about technology based on the English level of the respondents.

Statements*	English level	N	Mean ranking	df	X^2	p
3	Beginner	128	82.24	2	13.620	0.001
	Intermediate	41	106.54			
	Advanced	10	121.55			
5	Beginner	126	81.69	2	12.209	0.002
	Intermediate	41	102.04			
	Advanced	10	127.65			

*See Table 1 for statements.

geography teachers also had statistically significantly higher means (98.44 and 101.40) on the Statement 5 the beginner level geography teachers (79.30 and 65.89) (z=2.332 and p=0.20 in the intermediate-beginner comparison and z= -2.913 and p=0.004 in the advanced-beginner comparison) (Table 5).

DISCUSSION AND CONCLUSION

The literature reviewed in the early part of this study revealed that there is a broad-based consensus that, the use of technology in education, specifically in geography education, has various benefits including an active learning environment and student-centered education: the benefits apply to learning, teaching, student success, student inquiry, critical thinking, motivation, etc. (Smeets, 2005; Lambert and Balderstone, 2000; Fitzpatrick, 1993; Muir-Herzig, 2004; Hassell, 2002). Some research indicated, however, that lack of physical facilities, unreliability of technology, inadequate technical support, negative attitudes of teachers to technology, lack of skills needed for using technology, etc. are among the most serious barriers impeding the effective use of technology (Zhang, 2007; Keengwe and Onchwari, 2008; Hew and Brush, 2007; Unwin and Maguire, 1990).

Especially after the Ministry of National Education initiated the new geography course curriculum in 2005, many questions have been raised in academia regarding whether it supports wider use of technology, whether the tendency of teachers to use technology has increased, what are the impediments to the use of technology, and the required skills of teachers using technology. This study seeks answers to these questions from the perspectives of geography teachers who are the sole implementers of the curriculum. According to the outcomes

Table 5. Post hoc Mann-Whitney U test comparing the three English levels of teachers for statements 3 and 5.

Statements	English level	N	Mean ranking	Sum of rankings	U	Z	p
3	Beginner	128	79.43	10166.50	1910.500	-2.920	0.004
	Intermediate	41	102.40	4198.50			
	Beginner	128	67.31	8616.00	360.000	-2.537	0.011
	Advanced	10	97.50	975.000			
5	Beginner	126	79.30	9992.00	1991.000	-2.332	0.20
	Intermediate	41	98.44	4036.00			
	Beginner	126	65.89	8302.00	301.000	-2.913	0.004
	Advanced	10	101.40	1014.00			

*See Table 1 for statements.

of the research, it is quite encouraging that almost 90% of geography teachers surveyed believe that, for ideal geography teaching technology must be utilized at a maximum level (average score is 4.4 out of 5). Moreover, slightly more than 80% of the teachers indicated that, they have been utilizing technology more after the inception of the 2005 curriculum. The 2005 curriculum, clearly plays an important role in the adoption of technology into geography education. The high level of agreement of the teachers to the statement "The 2005 geography teaching program supports the greater use of technology" (84.4% and the mean score is 4.1 out of 5) also supports this idea (Table 1, Figure 2). These results support the previous studies (Taş et al., 2007; Demirci, 2009) on technology use in geography courses. Almost half of the respondents agreed or strongly agreed, however, that the limited facilities of their schools prevented them from using technology sufficiently in their courses, and 37.9% of them disagreed or strongly disagreed, the remaining 12.3% remaining neutral. Considering that most of the public schools and private courses agreed with this notion, it is fair to say that public schools and private courses in particular have difficulties integrating technology in their classes owing to the limited facilities of these educational institutions. It is quite encouraging, however, that more than 67% of the teachers stated that they know how to incorporate technology into their courses; the remaining 32.6% either disagreed/strongly disagreed or stayed neutral (Table 1, Figure 2). The agreement levels of the teachers to these last two statements also suggest that, the sufficient integration of technology will take some time.

As regards the statistical differences between the independent variables and the agreement level of the geography teachers, there were significant differences among the school types where the teachers were employed and their English level. Research outcomes showed that the public school teachers tend to support the idea that, the 2005 program supports more use of technology than do private school and private course teachers. Also, the higher mean rankings of the public school teachers on the use of technology in their courses under the 2005 geography teaching program showed that, the 2005 program affected geography education most in public schools. Moreover, public school teachers are more positive than private course teachers about the notion that "Technology must be used for ideal geography teaching." The level of agreement of the geography teachers on the statement "The limited facilities of the school prevent me from using technology sufficiently" revealed that public school teachers and private course teachers suffer the most from the lack of infrastructure, in using technology in geography courses compared with private school teachers (Tables 2 and 3). One may wonder why students are paying high fees for private courses, why they have limited technological facilities. We believe however, that the problem is not related to finance but rather to the system applied. Since these institutions offer courses lasting for one academic year only, they have to fit in four or five years of school geography content, so can only afford to provide the basics of geography. This very limited time does not allow them to benefit much from using technology.

The results of the study revealed very interesting results regarding the effect of teachers' English level on their belief about the importance of technology use in geography education. According to the analyses, the belief of geography teachers with intermediate and advanced level English about the importance of technology use is stronger than that of beginners. The outcomes also suggested that English level, plays an important role in their competence in using technology in their courses, since the teachers at intermediate and advanced levels of English are more competent in incorporating technology into their courses (Tables 4 and 5). Finally, it can be stated that, despite the fact that there is a common consensus among academia and geography teachers that technology provides numerous benefits for teaching and learning processes and must be used for ideal geography education, there are some gaps which must be filled by all shareholders: about half of the respondents suffer from the lack of technological

infrastructure in their schools and almost a third of them disagree or are neutral in response to the suggestion that they have enough knowledge about how to integrate technology in their lessons. The results indicated that, the 2005 program changed geography education in a positive way, especially in public schools. Additionally, the higher the English level of the teachers the stronger their belief about the importance of technology use in geography courses and their own competences.

REFERENCES

Ateş M (2010). The using of active board at secondary school geography lessons. Marmara Geogr. Rev., 22: 409-427.

Demiralp N (2007). Materials in geography education and the geography curriculum of 2005. Kastamonu Educ. J., 15(1): 373-384.

Demirci A (2009). How do teachers approach new technologies: geography teachers' attitudes towards Geographic Information Systems (GIS). Eur. J. Educ. Stud., 1(1): 43-53.

Demirci A, Taş Hİ, Özel A (2007). The use of technology at secondary school geography lessons in Turkey. Marmara Geogr. Rev., 15: 37-54.

Doğanay H (2002). Geography teaching methods: the fundamentals of geography education in secondary education. Istanbul: Aktif Press.

Dooley KE (1999). Towards a holistic model for the diffusion of educational technologies: An integrative review of educational innovation studies. Educ. Tech. Soc., 2(4), Retrieved February 1, 2011, from http://www.ifets.info/journals/2_4/kim_dooley.html.

Fitzpatrick C (1993). Teaching geography with computers, J. Geogr., 92(4): 156-159.

Gersmehl P (2008). Teaching geography. New York: The Guilford Press.

Hassell D (2000). Issues in ICT and geography. In Fisher C, Binns T (eds) Issues in Geography Teaching, RoutledgeFalmer, London, pp. 80-92.

Hassell D (2002). Issues in ICT and geography. In Smith M (ed) Teaching Geography in Secondary Schools, RoutledgeFalmer, London, pp. 148-159.

Hew KF, Brush T (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. Educ. Tech. Res. Dev., 55(3): 223-252.

Houtsonen L (2003). Maximizing the use of communication technologies in geographical education. In Gerber R (ed) International Handbook on Geographical Education, Kluwer Academic Publishers, Netherlands, pp. 47-63.

İncekara S (2007). International Trends in secondary geographic education and the case of Turkey. Marmara Geogr. Rev., 16: 109-130.

İncekara S (2010). The place of geographic information systems (GIS) in the new geography curriculum of Turkey and relevant textbooks: Is GIS contributing to geography education in secondary schools? Sci. Res. Essays, 5(6): 551-559.

Jonassen DH, Carr C, Yueh HP (1998). Computers as mindtools for engaging learners in critical thinking. Tech. Trends, 43(2): 24-32.

Keeler CM (1996). Networked instructional computers in the elementary classroom and their effect on the learning environment: A qualitative evaluation. J. Res. Comput. Educ., 28(3): 329-345.

Keengwe J, Onchwari G (2008). Computer technology integration and student learning: barriers and promise. J. Sci. Educ. Tech., 17(6): 560-565.

Kent WA (2003). Geography and information and communication technologies: some of the future thinking. In Gerber R (ed) International Handbook on Geographical Education, Kluwer Academic Publishing, Netherlands, pp. 337-344.

Lambert D, Balderstone D (2000). Learning to teach geography in the secondary school. London: RoutledgeFalmer.

Muir-Herzig RG (2004). Technology and its impact in the classroom. Comput. Educ., 42(2): 111-131.

Nellis MD (1994). Technology in geographic education: reflections and future directions. J. Geogr., 93(1): 36-39.

Özel A (2007). How social science and geography teachers perceive educational technologies that have been integrated in educational program. J. Appl. Sci., 7(21): 3226-3233.

Prensky M (2001). Digital natives, digital immigrants. On the Horizon. NCB Univ. Press, 9(5): 1-6.

Ruthven K, Hennessy S, Deaney R (2005). Incorporating Internet resources into classroom practice: pedagogical perspectives and strategies of secondary-school subject teachers. Comput. Educ., 44(1): 1-34.

Rüzgar B (2005). The sharing of knowledge in education benefiting from educational technology. Turk. Online J. Educ. Technol., 4(3): 114-119.

Scheffler FL, Logan JP (1999). Computer technology in schools: what teachers should know and be able to do. J. Res. Comput. Educ., 31(3): 305-326.

Seal KC, Przasnyski ZH (2001). Using the World Wide Web for teaching improvement. Comput. Educ., 36(1): 33-40.

Smeets E (2005). Does ICT contribute to powerful learning environments in primary education? Comput. Educ., 44(3): 343-355.

Sönmez ÖM, Çavuş H, Merey Z (2009). The usage levels of educational technologies and materials of geography teachers. J. Soc. Sci. Res., 4(2): 213-228.

Susskind JE (2005). PowerPoint's power in the classroom: enhancing student's self-efficacy and attitudes. Comput. Educ., 45(2): 203-215.

Taş Hİ, Özel A, Demirci A (2007). Geography teachers' perspectives on technology and the level of utilization of technology. Dumlupınar Univ. J. Soc. Sci., 19: 31-51.

Unwin DJ, Maguire DJ (1990). Developing the effective use of information technology in teaching and learning in geography. J. Geogr. Higher Educ., 14(1): 77-83.

Van der Schee J (2003). New media will accelerate the renewal of geographical education. In Gerber R (ed) International Handbook on Geographical Education. Kluwer Academic Publishers, Netherlands, pp. 205-214.

Van der Schee J (2006). Geography and new Technologies. In Lidstone J, Williams M (eds) Geographical Education in a Changing World: Past Experience, Current Trends and Future Challenges, Springer, Netherlands, pp. 185-193.

Waxman HC, Lin MF, Michko GM (2003). A meta-analysis of the effectiveness of teaching and learning with technology on student outcomes. Learning Point Associates. Retrieved January 31, 2011, from http://www.ncrel.org/tech/effects2/waxman.pdf.

Yaşar O, Şeremet M (2010). An evaluation of teaching methods and materials used in geography teaching in Turkish higher education regarding a number of variables. Int. J. Hum. Sci., 7(1): 675-702.

Zhang J (2007). A cultural look at information and communication technologies in Eastern education. Educ. Tech. Res. Dev., 55(3): 301–314.