

Full Length Research Paper

Views of student teachers on information technology integration in geography teaching

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The aim of this study is to examine the views of Primary School Social Studies teacher candidates regarding integration of Information Technologies in teaching and learning processes. The sample of the study was composed of 122 student teachers in their third year pursuing their studies in the “Department of Primary Education Social Studies Teaching”, Faculty of Education, Mehmet Akif Ersoy University. The study was conducted in three stages. In the first stage, student teachers were asked to prepare a one-hour lesson plan to find the answer to the question “How much do student teachers who are expected to start teaching within one year integrate Information Technologies in their lesson plans?” Of the participants, 59% were found to integrate Information Technologies in their lesson plans at varying degrees. In the second stage of the study, student teachers were posed an open-ended question to reveal their views on the reasons why they integrated or avoided integrating Information Technologies in their lesson plans. In the third stage of the study, student teachers were asked the following questions: “Do you think that information technologies are integrated in your geography lessons?” and “How much do you plan to integrate Information Technologies in your geography lessons when you start teaching in the future?” The responses to these questions were evaluated. The data obtained were analyzed through descriptive statistics method.

Key words: Geography course, student teacher, IT-information technologies, teacher education, technology.

INTRODUCTION

Individuals and societies who can analyze information literacy of this century can think more strategically and have the chance to renew. Today, effective instruction and learning require strategic thinking. Strategic thinkers approach teaching and learning from a critical and creative point of view (Duman, 2007: 3). In the past 30 years, developments in the ways of integrating communication technologies in education have caused the process and aims of the learning process to be questioned and redefined. The characteristics of a desired human profile have been revised. In this perspective, individuals are no longer expected to obtain information from one source to memorize it; on how to access information, use this information effectively the contrary, they are expected to be individuals who know

and productively, and create solutions to problems that they encounter using the information that they obtain. Teachers whose students are in constant contact with educational environments within a programmed instruction from the first years of primary school have a great role in helping individuals acquire these characteristics (Şahin and Yıldırım, 2006: 1 - 5).

Carmen (1996: 188) notes that in response to the advent of new information technologies, “teacher curriculum developers, and educational policy makers have focused on the implications for pedagogic and curriculum theory and practice”.

Today, extraordinary developments can be observed in the fields of educational technologies, the software sector and telecommunication. These emerging technologies have not only changed the view and shape of daily life, but they have also started to alter the educational and instructional structure, particularly in developed countries. Accessing, evaluating, organizing, using and sharing

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information have gained great importance. Fast developments in technology have made a significant impact on educational institutions whose aims include raising individuals equipped with behaviors which will meet society's expectations and will adjust to the times (Tavşancıl and Keser, 2001: 46). For this reason, instructional curricula need to be integrated with technology. In this respect, the concepts of the student and the teacher which are the two fundamental elements of traditional views of education and instruction, are being replaced by concepts of learning and guiding, and facilitating learning. In the new learning environments, teachers need to use information technologies effectively (Karahan and İzci, 2001: 70).

In the instructional program guidelines for the social studies course of the 6th and 7th grades introduced in 2005, social studies course teachers are asked to make optimum use of photographs, maps, films, CD-ROMs history and geography simulation programs, multimedia and hypermedia tools, and Internet services. They are recommended to arrange virtual field trips using the in-class Internet method when it is not possible to take the class on certain fields (Safran, 2005: 10).

Computers are an enabling technology: They are tools which enable geographers to improve their efficacy and efficiency in many ways. There are two key aspects of computers which assist geographers in this regard. First, computers can be used to collect and store large quantities of data in an organized manner. Second, such data can be quickly manipulated and presented in a whole host of different ways (Maguire, 1989: 222).

During the 1990s, many CD-ROMs (Compact Disk Read Only Memory) were published with geographical themes, which pupils are now making use of when studying geography. There is a growing interest in the use of e-mail to link schools and exchange data. Portable computers are used during fieldwork to organize and process data on site as well as in the classroom. Another recent development has been Geographical Information Systems (GIS) specifically intended for school use, where pupils can study variations in distributions over given areas and analyze how two or more such patterns may be related (Davidson, 1996).

There is a gradual increase in the use of instructional technologies in learning and teaching environments in faculties of education where student teachers of social studies receive training. The validity of the recent assertions that have frequently been made on new instructional technologies recently, are more acknowledged every day (Rich et al., 2000: 264). In traditional classroom environments, learning is limited to certain environments such as the classroom, the school, field trips, etc. However, in an instructional technology-based classroom environment, learning is possible in all environments like the classroom, the home and the office. Learning and accessing information can take place in any environment through the resources in the internet

environment. Interned-based learning develops experiential learning and facilitates connection between the learned knowledge and the real world (Khan, 1997). Information and Communication Technologies (ICT) comprise the use of at least one computer and computer hardware, Networks, and a host of devices that convert information into general digital formats (Lever-Duffy et al., 2003; Göktaş et al., 2009).

ICT may be a concept that has recently gained popularity, but the idea of using information technology in geography teaching and learning has a long history. The use of information technologies as a tool has not gained its rightful importance for learners and students. Yet, they offer beneficial use in any stage in formal and informal educational environments. Despite the importance of technology, there are many problems that geography teachers and members of faculty encounter. These problems range from access opportunities to technology, effective use of IT, and difficulties in implementation (Hassell, 2002: 148).

There are great opportunities to strengthen geography teaching and learning, and discussions generally center on these opportunities. Moreover, there are many methods to support teachers' tasks as they perform. These methods help teachers' effectiveness and activities in the background of their activity area to develop teaching and learning processes. Teachers are being encouraged to make use of IT in the teaching of geography because IT can and does make a valuable contribution to students' learning. By enabling students to handle, process and present data collected by them or from other sources, IT fosters enquiry approaches to learning, and through IT, students can pursue 'What if ...?' questions, and present results of enquiries in appropriate ways (Davidson, 1996:249).

Students can be equipped with the necessary skills through meaningful assignments and activities, and this objective can be realized only when teachers mediate their students in their use of computers and when students know how to use them. Instructional technology is readily being used widely in society and many people want to be sure that schools prepare their children to life in the world of technology in the 21st century and they view this as the duty of the school (Hassell, 2002: 149).

There are various assumptions which propose that IT use has many benefits in geography teaching and learning processes: Enhanced learning processes and enriched educational products; particularly software in large amounts, sharing of comprehensive/extensive sources, and lowering of potential costs, strategic opportunities, etc (Rich et al., 2000: 264).

Computers offer opportunities for use in diverse areas which can make geography instruction easier through various means. The use of computers as a source of information and data, use as analytical tools, as a laboratory for study of the earth, and as an instructor may be given as examples (Unwin, 1991).

The interactive problem-oriented learning approach emphasizes students' interests and curiosities toward a package program prepared for the course. Learner-friendly course software, text, graphics, images, animations and simulation elements are brought together and contain formative evaluation exercises (Laurillard, 1993).

Instructional technologies have an important place in geography teaching and learning. It affects geography instruction and helps students to conceive of geographic areas better, construct stronger cognitive structures in their minds, reflect what they have learned to their daily lives, and develop their problem solving skills. In this respect, studies conducted on the effects of technology use in the classroom support the above-mentioned views (Umay, 2004; Lemberg and Stoltman, 1999; Reed, 2001). Social studies teachers are viewed as individuals who undertake the most important role in using IT within teaching of social studies, particularly topics of geography. For this reason, this study aims to analyze in detail the perspectives to the use of information technologies in instruction among student teachers who will start the teaching profession in primary school in about one year.

Answers were sought to the following questions with this aim:

1. To what degree do social studies student teachers integrate IT in their lesson plans?
2. If the student teachers do not integrate IT in their lesson plans, what may be the reasons?
3. How often do student teachers use IT in their lives and for what purposes?
4. To what degree is IT used in geography lessons?
5. To what degree will student teachers integrate IT in their teaching when they start practicing their teaching profession?

MATERIALS AND METHODS

Participants

The study group was comprised of students in the 3rd grade pursuing their studies in the primary school social studies teaching department, Faculty of Education, Mehmet Akif Ersoy University, in the spring term of 2006 - 2007 academic year. The group was composed of a total of 122 students, 63 were girls (51.6%) and 59 were boys (48.4%).

Data Collection Instruments

The study was conducted to analyze how student teachers of primary school social studies approached the use of IT in their lessons.

Stage one

The student teachers were given an assignment as part of the

course "Special Instructional Methods – I", which they were taking in the second term of their third year. This assignment asked student teachers to "prepare a lesson plan for one class hour for any topic of geography, considering that all the opportunities are available", and they were left free to select the topic to plan for. It was seen that 59 of the student teachers (48.4%) included the use of IT technology in their plans. Then, the second stage of the study was started.

Stage two

In this stage, student teachers were asked such open-ended questions as "why did you not include IT in your lesson plans", and "if you have included IT in your plans, why did you do so?"

Stage three

In the last stage of the study, student teachers were asked the following open-ended questions: "Is IT integrated in your geography lessons sufficiently?" and "How much do you plan to integrate IT in your lessons when you start the teaching profession".

Data analysis

In the analysis of the data, text analysis was conducted in the first stage, and descriptive content analyses were administered in the second and third stages.

RESULTS

The findings reached as a result of the analysis of the data obtained from student teachers are arranged and presented below according to the stages of the study.

Stage one

"To what degree did the student teachers of primary social studies who are expected to start teaching in about one year integrate IT in their lessons?" To find answers to this question, the student teachers were asked prepare a lesson plan for a geography topic for one class hour, and the analysis of the texts in their lesson plans was evaluated based on technology use.

Question 1: How much do you include Information Technologies in your lesson plans?

As a result of the text analysis, it was found that 59 student teachers (48.4%) of social studies used Information Technologies (computers, PowerPoint, CD, Google earth), 18 of them used OHP, and 2 of them used the video. Considering that 79 of the 122 students included technology in their lesson plans, and of these, 59 students used IT, it can be stated that student teachers do not incorporate IT enough in their lesson plans. This insufficient use of technology by student teachers in their lesson plans was evaluated as a problem

and the following stages of the first stage of the study were administered.

Stage two

In this stage of the study, the student teachers were given a semi-structured form, in which they were asked a question seeking answers regarding the reasons for the lack of use of information technologies in their lesson plans and a question to determine how frequently and for what purposes they used IT in their lessons.

Students' responses to these questions were analyzed through descriptive content analysis and the following findings were reached.

Question 2: In the lesson plans that you prepared, it can be seen that you did not use IT sufficiently. What may be the reasons for this?

Student teachers' responses to this question are the following.

Categories regarding the reasons for student teachers not including instructional technologies sufficiently in their lesson plans:

(4 individuals) I did not think that technology use was necessary because the teachers and members of faculty that I took lessons from only used information technology to read information from the Power-Point in general.

(5 individuals) I thought showing examples of realia (leaves, roots, rocks, fossils, etc) would be more appropriate in the geography lesson.

(16 individuals) Since traditional methods and book-based instruction is undertaken in our lessons more often, I did not think of using Information Technologies, but I am aware of the benefits of using Information Technologies.

(7 individuals) The important point in geography lessons is for teachers to feel confident. The teacher is the person who will present the lesson.

(2 individuals) There is no need for using technology in such a lesson as geography, which is rather related to the natural environment. I thought that students would learn better through observation of the nature.

(4 individuals) I thought using a map and the globe would be more appropriate to the objective in geography lesson rather than using information technology.

(16 individuals) I did not include IT because I did not believe that the classrooms of the schools where I will start working as a teacher would have Information Technology facilities.

(4 individuals) Information is ready to present in Instructional Technology, so this might make the teacher lazy and prevent students from doing research.

(1 individuals) I thought computers would weaken

student-teacher interaction.

Reasons that student teachers included information technology use in their lesson plans:

(33 individuals) I thought that using instructional technology would be more effective as it addresses students' both visual and aural senses.

(10 individuals) Because I thought the use of information technologies would increase students' attention and motivation in geography lessons and facilitate permanent learning.

(8 individuals) Because I thought that showing maps and land activities on computer using animations would be more beneficial.

(3 individuals) I use Power-Point only to show important pictures and documents in geography lessons.

(8 individuals) I included IT because I thought using information technologies as much as possible would be beneficial.

When the student teachers' reasons for not including information technologies in their lesson plans are examined, it can be seen that the most frequently mentioned reasons are that they did not believe that there would be IT facilities provided in the schools where they would teach, and that, mostly traditional methods and book-based instruction were used in the lessons that they attended. A majority of the student teachers stated that they had difficulty accessing IT. In some classes, there are computers and projectors; however, a large majority of these computers are either insufficient or do not receive the necessary technical service, and thus they are out of order.

Question 3: How do you define the place of computers in your lives? How often do you use them? For what purposes do you use them?

Table 1 shows that 48.4% of the student teachers use information technologies almost every day. These student teachers explained that information technologies have become an important part of their lives and that they could not think of a life without IT. It is noteworthy that 17.2% of the student teachers use IT once a month or less frequently. These participants stated that they generally found computers boring or unnecessary, and some stated that they did not use computers in their lives because computers were bad for eyesight, or that they did not have computers of their own.

Table 2 shows that 46.7% of the student teachers view IT use as an indispensable part of their lives. 36.1% of the student teachers stated that using IT is necessary, but that they use it only when necessary and as much as necessary. 17.2% of the student teachers stated that they

Table 1. Frequency of IT uses among Social Studies student teachers.

Period of use	Number of individuals	Percentage
1. I use it every day	59	48.4
2. I use it 2 - 3 times a week	16	13.1
3. I use it once every week	26	21.3
4. I use it once a month	21	17.2
Total	122	100

Table 2. The role of Information Technologies in the lives of student teachers.

Role in life	Number of individuals	Percentage
1. It is indispensable for me.	57	46.7
2. I believe in its necessity.	44	36.1
3. It is not indispensable. It is difficult to access computers. My computer literacy and technical hardware are insufficient.	21	17.2
Total	122	100

Table 3. Aims of IT use by Social Studies student teachers.

Aim of use	Number of individuals	Percentage
1. Homework and research	52	42.6
2. Homework, e-mail, MSN	26	21.3
3. Homework, research, daily news, magazines	14	11.5
4. Homework, games, music, entertainment, chat	30	24.6
Total	122	100

did not view IT as an indispensable part of their lives and the reasons for this were that computer access was difficult and their knowledge of computers was insufficient.

Table 3 shows that 42.6% of the student teachers use IT to do their homework and do research. A majority of the student teachers in this view are the same students who stated that they did not view IT as indispensable and only used IT once a month. 24.6% of the student teachers use IT mainly for homework, games, music, entertainment and chatting, and 21.3% of the student teachers use IT for homework, e-mail, msn. 11.5% of the student teachers stated that they use IT for homework, research, daily news and magazines. The most noteworthy point in this case is that homework is in the first place in the student teachers' purposes of use.

Stage three

In this stage of the study, the student teachers were given forms containing the following question: "In your geography lessons, are Information Technologies incorporated at a sufficient degree?" and "How much do you plan to incorporate Information Technologies in your

lessons in the future when you start the teaching profession?"

Question 4: Are information technologies integrated in your geography lessons at a sufficient amount?

Table 4 shows that 73.8% of the student teachers view that the degree to which IT is integrated in lessons is insufficient and 26.2% state that it is sufficient.

Question 5: To what degree are you planning to integrate Information Technologies in your lessons when you start the teaching profession in the future?

Table 5 shows that 41.1% of the student teachers of social studies view that some faculty members sometimes use IT, but they do not find this sufficient. 40% of the student teachers state that faculty members insist on using traditional instructional methods and do not adapt to the use of IT. 14.5% of the student teachers state that the computers in the classrooms were old, out of order or inadequate as a reason for insufficient use of IT in geography lessons.

Table 4. Views of Social Studies student teachers regarding whether information technology is sufficiently integrated in Geography lessons.

Degree to which IT is integrated	Frequency	Percentage
1. Sufficient	32	26.2
2. Insufficient	90	73.8
Total	122	100

Table 5. Views of Social Studies student teachers regarding the reasons for insufficient amount of integration of IT in geography lessons.

Reason for lack of IT integration	Frequency	Percentage
1. Insistence of members of faculty on using traditional instructional methods and not adapting to IT use	36	40
2. Insufficient period of class time	4	4.4
3. The computers in classrooms being old, broken and insufficient.	13	14.5
4. Some members of faculty use it but there is not enough.	37	41.1
Total	90	100

Table 6. View of social studies student teachers regarding the degree to which they will integrate IT when they start their teaching profession in the future.

Frequency of using IT	Frequency	Percentage
1. I will use IT quite frequently.	74	60.7
2. I will use IT when necessary as much as necessary.	45	36.9
3. I will not use IT.	3	2.5
Total	122	100

As a solution to this, student teachers suggested that geography class hours should be increased, computer hardware in classes should be updated and faculty members should receive in-service training to become familiar with IT.

Some of the student teachers of social studies stated that some faculty members used IT in an exaggerated way in geography lessons; in other words, they used IT only by transferring information onto slides to read from the power point during the lessons, and that some faculty members never used IT.

Table 6 shows that 60.7% of the student teachers plan to use IT frequently when they are appointed to a place to teach. 36.9% of the student teachers state that they will use IT when necessary and at a necessary amount and 2.5% state that they will not use IT.

The reasons why social studies student teachers design plans to use IT in their future geography lessons were to access information faster and easily, to reach updated information as the age of information necessitates, to increase visual elements in their lessons particularly to be able to address more senses, to make the lesson more attractive for students, to make it possible to study distant places, to be able to attract students' attention, and when there was no chance to apply trip-observation method in geography lessons.

A majority of social studies student teachers do not believe that there will be IT facilities in the schools where they will be appointed. For this reason, they state views regarding experiencing problems using IT. They state that they will try to use IT as much as opportunities will allow them.

Some student teachers state that computers are bad for health since they emit dangerous rays, prevent close relationships between people, and make life monotonous, and therefore computer use should be limited.

Some student teachers state that they prefer doing geography lessons using the materials that they prepare rather than those prepared on computer. For example, the smell of sulfur, the hardness of rock, and taste of water cannot be demonstrated using the computer, but these can be shown through observation.

DISCUSSION

In the information age of today, all geography teachers should be actively looking at the use of IT in their schemes of work, which is an opportunity as well as a challenge (Davidson, 1996: 259). Teachers of the future are required to have information technology skills. Considering these, more than half of the social studies

student teachers do not integrate IT in their geography lesson plans. This finding is consistent with the literature (Rogers, 2000) and supports the view that student teachers in education faculties be provided with adequate ICT education (Göktaş et al., 2009).

The discussions in this study basically focus on the IT use in geography education in schools, while the IT skills acquired in higher education have an effect on geography education. The journal of geography allocates a large portion of recent research to the effects of web-based technology on geography instruction (Sui and Bednarz, 1999).

It is now accepted that all teachers need to have an understanding of the way in which Information Technology (IT) can enhance teaching and learning their subject. Geography is a subject to which IT can make a genuine and worthwhile contribution and it is therefore even more important that geography teachers know how to harness the benefits of IT for their students (Freeman, 1997: 202). The frequency with which student teachers use IT every day is found as 48.4%, that is, half of the participants. This shows that the use of IT in schools and students' lives increases every day. In the study conducted by Umay (2004) in the Faculty of Education at Hacettepe University, it was found that the majority of student teachers of Primary Education mathematics teaching department included IT in their lesson plans. The finding in the current study indicates that 46.7% of the student teachers view IT as indispensable in their lives supports of this finding. It is noteworthy that about half of the student teachers (42.6%) use IT only for homework and research. This indicates that student teachers are assigned a lot of research assignments and that faculty members encourage students to use IT. Student teachers state that IT is not included in geography lessons sufficiently. Prospective teachers should have the opportunity to observe appropriate models throughout their undergraduate process (Bullock, 2004; Whetstone and Carr-Chellman, 2001). This indicates that student teachers would like to have rich stimuli in geography lessons that they are presented. It is predicted that teachers can be more effective and productive through the use of stimuli which address more sense organs.

Some problems are experienced regarding the computer and connection hardware in a majority of schools. However, Ministry of National Education aims to increase the speed and quality of education through the education portal project, to create opportunity for the environment, content and access, and to facilitate equality in education. Moreover, "Using Information Technologies" is one of the eight basic skills specified by the Ministry of National Education for grades 6 to 8 of primary education to be included in the curricula as of academic years of 2005 – 2006 (Safran, 2005). Student teachers stated that they encounter such problems as economic difficulties, crowded classrooms, lack of sufficient time and inadequate tools and equipment and

limited infrastructure for IT as problems that inhibit their use of tools and equipment. In addition, Yıldız et al. (2002) reported that teachers encounter such problems in the use of IT as inflexibility of educational programs, teachers' inability to receive the necessary pre and in-service training, failure to equip schools with the necessary tools, equipment and materials, ineffectiveness of the required administrative and incentive mechanisms and financial hardships.

The rich combination of an academic discipline and technology provides numerous opportunities to improve geography in schools (Lemberg and Stoltman, 1999: 65). Despite the major developments in the field of technology, the number of software to be used in geography in schools is limited. Since most of the available software in this area is produced in foreign languages such as German and English, teachers and students have difficulty benefiting from them. The quality and availability of appropriate software are increasingly being seen as an important issue.

A large majority of student teachers state that they will incorporate IT in their teaching frequently when they are appointed to the profession. The findings obtained from the data analysis are consistent with the findings reached by Aşkar and Usluel (2002) in their study on IT use in schools. These researchers reported in their study that IT has become part of the system in schools, but that teachers' use of IT in instruction will take some time. The teachers in their study stated that, by using IT, they would be able to access information more easily, the facilities would be more conducive, and technological developments would increase the use of IT in classroom environments.

The impact of using ICT on motivation is clearly an important consideration. Indeed, research into the views of pupils and teachers in thirteen secondary schools in Birmingham showed that the general level of motivation among pupils increased significantly when they used information technology (Lambert and Balderstone, 2000: 226).

Conclusion

In conclusion, the student teachers who participated in this study stated that they would do a variety of activities in the classroom environment for an effective teaching-learning process, that they were considering using IT to facilitate students to be exposed to multiple learning environments in the lessons; however, that they encountered certain problems regarding IT use and that the new social studies instruction curriculum which was newly introduced to the system (Safran, 2005) increased the use of IT in the classroom. On the other hand, they explained that there occurred certain difficulties which stemmed from lack of sufficient preparation related to the program and that they had expectations regarding IT use

in the future. Whilst the technology moves on leaps and bounds, schools still suffer from the lack of access to effective software, data and other information. Software is a particular problem, for example the majority of mapping software or GIS available for schools is either not suitable or priced at a level which is prohibitive (Hassell, 2000: 89).

In the light of the findings obtained from the study, the following suggestions may be made. The insufficiency of tools and equipment should be overcome by bringing such pieces of equipment as video and computers, which are low in access at primary level in our schools, within possible reach (Yıldırım, 2008: 303). Thus, students may have rich experiences using this equipment. Work should be done to prepare programs in which teachers can develop and use their creative powers in the in-service education courses which are set up by the Ministry of National Education.

New studies may be conducted to determine the way in which geography learning and teaching habits are changed by Information Technologies. Studies may be conducted on the degree to which Information Technology skills take place in the instructional programs in schools, which are expected from individuals by the society. The opportunities that information technologies offer to enrich geography learning and teaching may be examined. In-service education courses may be organized for teachers to use information technologies effectively.

This study encompasses student teachers of social studies regarding the use of information technologies in geography lessons. Due to the low number of participants, the results found may be limited. Future studies may be conducted on larger and different samples.

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