

International Electronic Journal of Elementary Education
Vol. 3, Issue 2, March, 2011.



Experiencing technology integration in education: children's perceptions

Ahmet BAYTAK*

Harran University, Turkey

Bülent TARMAN

Selçuk University, Turkey

Cemalettin AYAS

Sinop University, Turkey

Abstract

The purpose of this phenomenological study was to explore the experiences of six children using technologies in their education. Data were collected via in-depth interviews, classroom observations, and home observations. The results showed that students have common perceptions toward their experience with technology integration. Furthermore, the following four themes emerged; the value of technology, authority over learning, misuses and misconceptions, and the border of integration.

Keywords: children's technology use, technology integration, technology integration at home, perceptions of children, learning and technology

Introduction

Students in today's schools are lucky enough to have access to many technology equipments and the Internet technologies. Almost every house has a computer available to children. According to the 2003 US census 69.9% of households had computer at home and 61.8% of them had the Internet access. For example, based on an unofficial survey done in research site school, 98% of the middle school students had computer at home and almost all of them had access to the Internet. The less developed countries have been also receiving aids to improve usage of technology in their schools. UNESCO and NGOs (Non-Governmental Organizations) are providing funds to such less developed countries in order to provide more technology equipments in their

* Correspondence: Ahmet BAYTAK, Ph.D., Harran University, Department of Computer Engineering, Osmanbey Campus, P.K. 153, 63000-Şanlıurfa / Turkey. E-mail: abaytak@harran.edu.tr Phone: +90 (0) 414-318-3000 (Ext. 1088)

schools. One Laptop Per Child (OLPC, 2008), for instance, is one of the projects that tries to provide portable computers to schoolchildren in these less developed countries.

As a result of this development, a 'digital divide' or disparity tends to exist between generations. Prensky's classification; digital natives and digital immigrants (2001), is a useful distinction in most communities. While digital natives have been born with new technologies, digital immigrants are still considering these technologies as luxury, extra, difficult, or troublemaker. This difference in generation, thus, brings new issues for use of technology in classroom (Tarman, 2009).

Technology is becoming more and more a part of classroom instruction and teachers are encouraged to use technology for their lessons (Ayas, 2006; Beers et al., 2000; Yücel et al., 2010). Technology in education has the potential for improving teaching and learning. If the current technology is appropriately designed for instruction, Earle (2002) believes, there is the potential to produce positive outcomes, social interactions, changes in teaching styles, more effective teaching, increased student motivation, and enhanced student learning. Speaker (2004) reports that most students feel their learning are improved by integrating technology into their learning. Therefore, educational technologies, specifically computer and the Internet technologies, have inevitably become powerful in the classroom as they change the way we teach and learn (Ayas, 2006). As technology makes learning more interesting, enjoyable and interactive, kids today love learning by doing, discovering, and interacting.

Review of Literature

While most of the technology integration research focuses on integration in classrooms, some scholars have specifically examined children's use of technology at home. Mumtaz (2001) found that children spend more time with technologies at home than at school. However, Lauman's study (2000) showed that students felt more comfortable using computers at school. Kafai and Sutton (1999) found that children's use of computers at home depends on permission from parents who have concerns about their children wasting time on the Internet and not doing educational activities (Mumtaz, 2001). However, it was also found that parents' support on the use of technology affects the level of integration at home (Giacquinta et al., 1993). They also found that few children who integrate technology for learning had highly involved parents who helped choose appropriate software, coached their child on the computers, worked jointly with the child at the keyboard, and offered praise as well as practical.

Even though most studies reviewed mainly focused on technology integration at school and home, students' experiences with technology at school and at home have been rarely investigated. The history of the last decade is also evidence that technological tools are changing dramatically and

therefore technology integration in classroom essentially changes as well (Yücel et al., 2010).

Student perception is an area in which a great deal of research has been conducted. For example, understanding their perceptions of parent involvement, professors' self-presentation styles, and discussion-driven classrooms has been studied in different studies. Research on students' perception of technology in education has been sparse and mostly limited to technology in e-learning or college students' perceptions. Among those studies, Lim et al. (2006) examined students' perceptions on computer vs. pen based testing, McMahn et al. (1999) studied college students' perceptions about barriers with computers, El-Tigi, Lewis, and MacEntee (1997) explored elementary school students' perception on the effectiveness of visuals on web-based instructions, and Shell et al. (2005) examined high school students perception on computer supported classrooms. The study by Levin and Barry (1997) also showed that young students found computers as a game machine both at home and at school.

According to the study done by İşman et al. (2004), students in undergraduate and graduate school perceived computers as a part of their life. These students also had a positive attitude towards computers since they think they are efficient tools for their life. Thus, the researchers concluded that the students had a consciousness about effects and importance of computers. Lui and his colleagues (2006) concluded from their students' perception on blogs that integration of blogs in the lessons could promote educational perception even though there are still some misuses of these technologies. According to Student Perception Model by O'Malley and McCraw (1999), the perceived effectiveness of a technology is based three factors; the prior educational conditions, characteristics of students, and perceived characteristics of technology.

Differently, some scholars explored and examined children's views and preferences about technology materials (Druin, 1999; Druin, 2002; Nettet & Large, 2004). Druin proposed Cooperative Inquiry and Human-Computer Interaction Community to examine technology tools that are proper for children. In these studies, children were involved in design and testing processes to find out their preferences. The User-Design Approach by Nettet and Large (2004) also looked at children's use of technological tools to design proper tools for their levels. However, in this approach involvement was found limited. Even though these approaches are crucial to understand children's views about technology and their use, children's views about integration of technology into education is not studied. Additionally, studies done in Constructionism and design-based research have involved children to explore their learning with technology tools (Harel & Papert, 1991; Kafai, 2005) but these studies are lack of children's perceptions about the characteristics of technologies they used and how those could improve their learning.

The Purpose of the Study

The main goal of this study is to explore how children define and use technology in their education. In other words, this study attempts to observe the experiences of individuals in order to understand their perceptions of technology integration into their education.

This study aims to begin fill the gap in several ways. First, the last decade is evidence that technologies are changing dramatically and therefore technology integration in the classroom must necessarily change as well. Thus, it is important to get a sense of how students feel about recent technologies and the integration of them into learning lives as a whole. Second, past studies primarily focused on upper level students in middle and high schools, thus the concentration here on elementary level students is an important contribution. Third, the increased usage of technology in schools indicates a need for studies such as ours. Finally, there is also an increased usage of technologies at home, which is rarely studied in relationship to technology integration into learning.

Moreover, children's future technology perception and imagination make this study unique. In another words, what kinds of new tools or programs students perceive for future and how these new developments can be used for learning also raise the importance of this study. By looking at students' perception for future technological developments may help technology designers to build more appropriate technological tools for students to use for education.

Research Context and Methodology

The research site was an elementary and middle school located in a college town in the Northeast of the United States. Students attending this school are generally from the middle class whose parents are mostly affiliated with a well-known state university. According to mission of the school, technology is one of the key aspects of the curriculum. The school offers technological equipments for classes and after-school technology clubs. The participants of this study were selected from these technology clubs. The selection of the participants was based on their parents' consents.

In Technology Education classes during the regular school hours, the students were taught about Word processing, Excel, and PowerPoint. In the technology clubs, however, the students designed games and animations with the provided software. Since the study was limited to students in the technology club, the interested students for the study were already good at technology use. For example, out of six study participants, three of them (John, Geff, and Allan) attended statewide conference workshop to display their animation designs.

This phenomenological study attempts to understand and attain a description from the students regarding the perception of individuals and lived experience of individuals about this phenomenon. The discipline

investigates the *why* and *how* of decision making, not just *what*, *where*, *when*. Creswell (1998) also defines qualitative research as “an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting” (p. 15).

In this study, we questioned the experiences of the students with technology integration. We did not expect any change in students’ outcome or achievement. The study is neither has any hypotheses to prove. The current study is expanding the research in the participants’ lives where they experience technology integration yet it is not based on ‘standards’ or ‘certain objectives’ as Marshall & Rossman (1980) puts it. Furthermore, the study is concerned with the process and the meaning of technology integration for the students. Thus, qualitative approach fits perfectly to apply in this research. This study aims to investigate not the external truths but their interpretations of emotions and events within the definition of phenomenology.

Data Collection and Analysis

The data of this study are students’ thoughts, ideas and perceptions from digitally recorded interviews, observations in their natural environment, and field notes. Interviews are centered on getting in depth information of lived experience with the phenomena. For a broader perspective, there are two types of observations in this study; classroom observations and home observations. These both observations aimed to get more in depth understanding of phenomenon by recording non-verbal behaviors and physical settings.

Classroom observation was done before and after the interviews. The first observations were helpful to generate some interview questions. Since the researcher had been working with the students before, students were familiar to the researcher’s class visits during their technology usage hours. Therefore, it was believed that observations did not influence students’ behaviors. Class observations were done by note taking while home observations included recordings in addition to note taking.

Different from previous studies, students’ technology use and technology settings were observed at home as well. Home observations were done after getting detail information from the students during the interviews. These observations were limited to 30 minutes and students were also asked some questions to get more information about the technology integration at home.

In depth interviews was necessary for this phenomenological study to get more information about the experience of the students with technology integration. Since the younger students were not that much talkative, we could not follow every step of Irving Seidman’s (1998) interview protocol. For example, the interviews were less than 30 minutes each since the students

didn't have anything to say. However, we asked prompt questions based on students statements. That helped us gather clarification and amplification in their thoughts and ideas. Interviews were also recorded with digital voice recorder and there were note taking for prompt questions and outline of the data. After the interviews, the recordings were transcribed with minutes.

An ethical issue that may come up in this study is about the researcher's position at the research place. The students and their parents were informed that there was no grading for students' progress for participating into the study or leaving the study in the middle. There was also no intervention in this study to affect students' behavior or performance at school.

Findings

Background Information

According to mission of the school, technology is accepted as one of the key aspects of the curriculum and the school promises to provide cutting edge technology in its unique educational program. Each classroom is equipped with LCD TVs connected to cable TV service, projectors, internal sound systems, classroom laptops, and cameras available for teacher and student use. The laptop- student ratio was 4:7 and laptops were found more flexible for students to take the classrooms and integrate into any subject area.

The participants of this study were six boys (John, Geff, Tony, Allan, Joe, and Brian- all names presented are pseudonyms) at fifth and sixth grades. Joe was the one of the best in his sixth grade class for academic achievement. John's both parents are teachers and he speaks two languages. He was always interested in topics about computers. He had his own computer at home. Geff could be the quietest students in his classroom but he was always doing his homework and class work on time. His both parents are professors in different majors. According to our home observation there are 4 computers at his house and most of them are available to him.

Even though Tony moved to the country in last few years, he didn't have any problem with language. However, he still needed to improve his self-confidence that was also showed up in the interviews and class observations. Tony was also interested in computers and he attended Technology Club last four semesters. He was sharing a computer with his siblings. Allan also attended all technology clubs sessions in last two years. His classmates called Allan computer geek. He had already used several computer programs with his own computer at home. His parents are involved with university.

Joe and Brian were also attended all technology club sessions but both were less interested in computers games comparing with other four students mentioned above. Joe also had his own computer at home and was able to fix most of the problems with his computer. Brian was sharing one computer with his siblings and limited time to access this computer during weekdays because of his parents' views.

Children's Perceptions

Based on the data analysis, four themes emerged; the value of technology, authority over learning, misuses and misconceptions, and the border of integration.

The value of technology: Almost all the students had similar perceptions when defining technology. All of them believed that anything that works with electricity is technological. Allan, however, added “controllable tools” to his definition as he thinks these tools must be helpful also in order to consider them as technological. John thinks that technological should “entertain.” When they were asked for examples, they started with computers and game boys. On the other hand, none of the student has ever heard of the term “technology integration.” But, they were aware of the influence of technology in their learning.

When the students were asked about their first experience with technology, most of them recalled their first game boys and what they learned from these tools. All the students think that their first experience with technology was fun and now they still feel fun when they use for even educational purposes. For example, John mentioned that “... [for] example like writing essays writing, instead of your hand for writing you can type and I think typing is fun and less tired. Doesn't tire you that much.”

Authority over learning: Class observations and interviews transcripts are evidence that students feel an authority over their learning in classroom with computers. It was observed that students' behaviors in technology based classes, comparing in their other classes, altered from followers to semi-follower. In other words, students were acting as they were fully dependent to teachers but in classes with computers they were more independent. Similarly, students perceived that they cognitively feel ore powerful when they use computers in their lessons. For instances, as other five students, John mentioned in the interview that:

“I think technology make me feel smarter because of all these lots of parts put together so how can I explain well (...example?) like going on internet seeing like math reading all these kinds of stuff, finding out new links to easy ways, they make so much easier and make smarter. I do better that way.”

Misuses and misperceptions: Since integration of technology especially with computer technology is new topic in most school communities, there are still some misuses andns misperceptions by teachers and parents who have has hold the main power for the decision on integration.

Even though the students' technology experience at school considered as integration, the use at home is not common. Similar to a previous study (Kafai & Sutton, 1999), this study also found that the parents' concerns, limitations, and less experience with integration becomes a barrier for the

integration at home. The home observation and interview also projects parents concerns since the students used computer at home mainly for gaming and chatting. However, Brian pointed out “I just try to use that time (his has 30 minutes every day to use for anything) to do my homework, not after I do my homework I can others (he listed others as games etc.).”

It was observed that only few teachers use technology tools in their classrooms and therefore students had less integration experiences in other classes. The students believe that technology can only be integrated in certain subject areas. For examples, Tony preferred use technology in math class but not either in science or physical education classes. Similar to that Brian also think that music should not be taught with computers.

The border of integration: When the students were asked about advantages and disadvantages of using technology for learning, they built a border of technology in education. For example, most of the students listed “searching on the internet” as one of the main benefits of technology for education. Similar to other findings (Saye, 1997) in the literature, students in the current study apparently valued the efficiency, speed, and clarity that technology provides for education. Allan specifically focused on how that Internet based communication could help economy based on his mother’s experience. He, indeed, thinks that animated content on computers also get attention and therefore implementing computers for learning will be not as boring as reading book.

Nevertheless, some students think that use of technology in learning should be limited. For example, Brian and Geff prefer to have a person teach them instead of learning with computers since machines may not give them instant feedback. Allan thinks that “*it is funny to use term ‘educational’ for the cartoons on TVs since they are not.*” All the students have fear that the computers may get broken and they lost their files. This fear was experienced during the researcher’s class observation that some younger students delete a student’s file for his social studies work. It can be driven from the interview and observation that students think that technical problems and viruses, less feedback functionality, and physical damage on eyes are the common barriers to integrate technology into education. Because of those listed benefits and barriers, students have drawn an imaginary border of technology in education. It was found that students, such as Allan, with more experiences in technology use, had a wider border when they described advantages and disadvantages of technology in education.

Based on the students’ radius of the border they had drawn, their views of technology integration for future were shaped. When we asked them what kind of technologies would be in classrooms in next ten years, John expected that there would be holograms, better quality microscopes, and machines that type for users. Besides his dreams of teleports in future, he also noted that “... we can use to study like other recourses such as machines that will pick up recourses and study it and give a description of it or even maybe our

own kind of microchip. We can and explore with to more field trips to places. Learn more about fossils in a technological way.” Another student, Geff, was wishing a common problem in technology integration to be solved without being aware of some programs; “...maybe if you loose a file you could get back.”

Discussions and Conclusion

The aim of this study was to explore the experiences of six young students using technologies in their classroom. As a discussion topic of this paper, there are some conclusion could be drawn from the findings of this current phenomenological study.

First of all, it was found interesting that when the students were asked to define the term ‘technology’, most of them listed the features of technology that has value of fun and entertainment. In other words, the educational value that the children gave to technology was more about the motivational factors. Another value that the students listed for technology was the feature of a tool that makes things easier. Especially, when the students mentioned about communication tools as technology, they emphasized that these tools make their life easier and therefore the process of learning becomes effortless.

Secondly, whether in student-centered or teacher-centered classrooms, students in this study were acted more independent when they were observed in their classroom with computers. Even though the students have ownership of learning and they have more authority over their learning, at these age levels, teachers are still the authority that believed to know everything. The students, for example, think certain website trustworthy because the teacher said so. In other words, students are aware of fact that they need scaffolding in their learning process where the teachers could act as milestone when they needed.

Thirdly, as it has been indicated in the previous studies (Kafai, 2005; Lauman, 2000; Mumtaz, 2001) that children like to use home computers for gaming purposes came up in this study as well. The high percentage of computer use for gaming (77% of children regularly used computers for gaming), has a factors on parents misconception about the use of computers at home. It was found in this study that most of the parents think that their children were not doing anything educational on the computers. A parallel misconception was found among the students’ teachers that technology is tool to transfer information, and therefore, they think that home computers are still not under their control to give educational task for students to do. Similar to previous studies (Kafai & Sutton, 1999), this study also found that parent concerns and limited experience with the use of technology for learning could be a barrier for integration at home. For example, Brian pointed out, “I just try to use that time [he has 30 minutes every day to use for anything] to do my homework, after I do my homework I can do others [he listed others as computer games etc].” Thus, there is a need for schools and

teachers to rearrange the types of homework, which may require more technology use such as doing more research, designing digital artifacts, or building their own portfolios. In addition, it is necessary to setup more communication channels between teachers and parents to increase effectiveness of home technologies for educational purposes. Course management systems are available options to start this communication.

Finally, this study revealed that students draw the border for the integration of technology into education. Even though all the children of this study see technological tools as fun and entertainment channel, they were mostly conscious about the balance of technology integration into their lessons. The children were able to list the advantages and disadvantages of this integration. However, it was found that, the students' less experiences of the integration in both classroom and at home had influenced their perceptions. Supporting to this idea, İşman et al. (2004) pointed out in their study that "this means that there is a consciousness about effects and importance of computers but there are a few tendencies to apply the consciousness or willingness of new technological style because of not having particular education, encouragement and facilitative environment" (p. 20).

In addition, it was discussed in the previous studies that teachers and K-12 schools and faculties in higher education complained about technical problems and lack of support (McMahon et al., 1999). However students in this study mentioned those as teachers' problems. The reason for that could be because they do not see the technical problems as their responsibility or they found their ways overcome to problem. For example, based on classroom observation and interviews, students try to solve technical problems by themselves. It could also be concluded that the more implementation, the wider the border of integration could be.

In conclusion, this research disclosed the reality that changes in technology influence students' experience with technology. Thus, this study should be helpful for the curriculum and technology designers, and educators to consider these perceptions of the students in the future educational plans and policies. Our participants' experiences with technology integration also support Smith's findings that some faculty may not be well prepared or trained for the available technology and which creates distance between students and teachers. Parallel to that, a participant of this current study, Allan, also made a recommendation that "more people should use [technology in classrooms] but they have to have backup plans if there might be virus etc."

Thus, as an implementation of this study, schools may setup their own course management systems to enrich students' learning both at school and at home. For more encouragement of technology integration at home, teachers need to provide more educational games that they should be able to control the content of the games, which becomes both educational and fun for children. Based on the previous studies about teachers' perceptions and the

results of this study, it is also important to note that school administrations and teachers should develop new ways to integrate technology into education for an effective learning environment.

It is noteworthy that children of the Internet generation enjoy communicating through online and sharing the things they liked. Thus, age-appropriate chat and discussion platforms and information and artifact sharing sites are necessary for these students to productively use technology both at school and at home. At the same time students could be required to build their learning portfolios in secure sites manageable by school administrations and accessible to their parents.



Received: 23 November 2010 / Revised: 5 February 2011 / Accepted: 10 February 2011

Ahmet BAYTAK is an Assistant Professor in the Department of Computer Engineering at Harran University, Turkey. He received his Ph.D. degree in Educational Technology from The Pennsylvania State University. His major research interests include instructional technologies and the use of computer and the Internet applications in educational settings.

Bülent TARMAN is an Assistant Professor in the Department of Social Studies Education and serves as the vice chair for the Institute of Educational Sciences at Selcuk University, Turkey. He has a Ph.D. degree in Social Studies & Comparative Education from The Penn State University. His research and teaching focused on teacher preparation in social studies, democracy education, and European Union & educational systems.

Cemalettin AYAS is an Assistant Professor of Social Studies Education at Sinop University, Turkey. He received his Ph.D. degree in Social Studies & Global Education from The Ohio State University. His current research and teaching mainly focus on social studies & geography education, teacher preparation, and educational technology.

References

- Ayas, C. (2006). An examination of the relationship between the integration of technology into social studies and constructivist pedagogies. *The Turkish Online Journal of Educational Technology*, 5(1), 14-25.
- Beers, M., Paquette, K., & Warren, J. (2000). Student view of classroom technology use. Society for Information Technology and Teacher Education International Conference: Proceedings of SITE 2000.
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.
- Druin, A. (1999). Cooperative inquiry: Developing new technologies for children with children. Proceedings of CHI'99, ACM Press.

- Druin, A. (2002). The Role of children in the design of new technology. *Behavior and Information Technology*, 21(1), 1-25.
- Earle, R. (2002). The integration of instructional technology in to public education: promises and challenges. Retrieved December 10, 2008 from <http://www.asianvu.com/bookstoread/etp/earle.pdf>.
- El-Tigi, M. A., Lewis, B. A., & Mac Entee, V. M. (1997). Perception of elementary students of visuals on the web. In: *VisionQuest: Journeys toward Visual Literacy. Selected Readings from the 28th Annual Conference of the International Visual Literacy Association* (Cheyenne, Wyoming, October, 1996).
- Giacquinta, J. B., Bauer J, A, & Levin, J, E, (1993). *Beyond technology's promise: An examination of children's educational computing in the home*. Cambridge, U.K.: Cambridge University Press.
- Harel, I. & Papert, S. (1991). Software design as learning environment. In I. Harel S. Papert. (Eds.). *Children designers: Interdisciplinary constructions for learning and knowing mathematics in a computer-rich school* (pp. 41-85). Norwood, NJ: Ablex.
- İşman, A, Çağlar, M., Dabaj, F., Altınay, Z., & Altınay, F., (2004). Attitudes of students toward computers. *The Turkish Online Journal of Educational Technology*, 3(1), 11-21.
- Kafai, Y.B (2005). The classroom as “living laboratory”: Design-based research for understanding, comparing, and evaluating learning science through design. *Educational Technology*, 45(1), 28-34.
- Kafai, Y. & Sutton, S. (1999). Elementary school students’ computer and internet use at home: Current trends and issues. *Journal of Educational Computing and Research* 21(3), 345-362.
- Lauman, D. J. (2000), Student home computer use: A review of the literature. *Journal of Research on Computing in Education*, 33(2), 196-204.
- Levin, B. B., & Barry, M. S. (1997). Children’s views of technology: the role of age gender and school setting. *Journal of Computing in Childhood Education*, 8(4), 267-290.
- Lim, E., Ong, B., Wilder-Smith, E., Seet, R., (2006). Computer-based versus pen-and-paper testing: Students’ perception, *Annals of the Academy of Medicine Singapore*, 35(9), 599-603.
- Lui, A. K., Choy, S.-O., Cheung, Y. H. Y., & Li, S. C. (2006). A study on the perception of students towards educational weblogs. *Informatics in Education*, 5(2), 233-254.
- Marshall, C., & Rossman, G.B. (1989). *Designing qualitative research*. Newbury Park, CA: Sage Publications.
- McMahon, J., Gardner, J., Gray, C., & Mulhern, G. (1999). Barriers to student computer usage: staff and student perceptions. *Journal of Computer Assisted Learning*, 15, 302-311.
- Mumtaz, S. (2001). Children’s enjoyment and perception of computer use in the home and the school. *Computers & Education*, 36, 347–362.
- Nesset, V., & Large, A. (2004). Children in the information technology design process: a review of theories and their applications. *Library and Information Science Research*, 26(2), 140-61.
- OLPC, (2008), One laptop per child. OLPC.org.
- O’Malley, J., & McCraw, H. (1999). Students’ perceptions of distance learning, online learning, and the traditional classroom. *Online Journal of Distance Learning Administration*, 2(4). Retrieved December 10, 2008, from <http://www.westga.edu/~distance/omalley24.html>.

- Prensky, M., (2001), Digital natives, digital immigrants. On the Horizon Vol. 9(5) Retrieved December 02, 2008 from <http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf>.
- Saye, J. (1997). Technology and educational empowerment: students' perspectives. *Educational Technology Research and Development*, 45(2), 5-24.
- Seidman, I. (1998). *Interviewing as qualitative research: A guide for researchers in education and the social sciences (2nd Ed.)*. New York: Teachers College Press.
- Shell, D. F., Husman, J., Turner, J. E., Cliffl, D. M., Nath, I., & Sweany, N. (2005). The impact of computer supported collaborative learning communities on high school students' knowledge building, strategic learning, and perceptions of the classroom. *Journal of Educational Computing Research*, 33(3), 327-349.
- Speaker, K. (2004). Student perspective: Expectations of multimedia technology in a college literature class. *Reading Improvement*, 41, 241-254.
- Tarman, B. (2009). The Digital Divide in Education, ERIC # 508213 [Retrieved on 14.12.2010 from <http://eric.ed.gov/PDFS/ED508213.pdf>].
- Yücel, C., Acun, İ., Tarman, B. and Mete, T. (2010). A Model to Explore Teachers' ICT Integration Stages. *The Turkish Online Journal of Educational Technology*, 9(4), 1-9.
- U.S. Census, Internet use at home. Retrieved January 27, 2008 from <http://www.census.gov/population/www/socdemo/computer/2003.html> and http://www.ntia.doc.gov/reports/2008/table_householdinternet2007.pdf.