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Special Education Teachers' Opinions Regarding Tablet Computers in Education

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ABSTRACT This study aimed to identify the views of special education teachers in North Cyprus about the use of technological devices in special education. A descriptive case study was conducted in this research. The semi-structured interview method, which is appropriate for qualitative research methods,was used to collect the data. In conclusion, digital devices, which have begun to be used by all human societies in these days, affect the area of education from a digital anthropological perspective. Teachers indicated that positive consequences of this effect could be achieved through specific applications developed for these devices. Teachers try to use these devices with their individual efforts and think that these devices are effective. When considering from the perspective of children, they gained familiarity with digital environments as other individuals and teachers indicated that children are more interested in materials presented through digital devices and educational environments.

INTRODUCTION

Nowadays, technology facilitates human life and advances rapidly. Important studies are being conducted on the integration of developed technologies in the field of education, both in the country and further afield. However, technology developed during this process is generally intended for formal, mainstream education. In other words, new technological environments and applications are developed for people without disabilities. There are insufficient designs for students with disabilities (Arpacik et al. 2013; Williams 2011). Designs used for students with disabilities are generally traditional, such as visual cards and materials with text and pictures combined. Unfortunately, use of more modern material, including in current technologies, has not become prevalent in the education of people with disabilities. Any material, equipment or developed products directly obtained or modified and used to increase, maintain and develop functional capacities of individuals with disabilities are defined as assisted technologies (Braddock et al. 2004).

Digital anthropology is a discipline, which examines the relationship between people and digital technologies and studies the outputs of these relationships (Horst and Miller 2012). All human communities have been included in, and been obliged to adapt quickly to, digital environments. Major changes have occurred in human lives with these devices. Individuals socialize through sharing statuses on social media and interacting with other individuals, and becoming a part of this digital environment during a large portion of their daily lives. As a result of the prevalent use of digital devices, familiarity with devices has increased at a high rate after entering this new digital environment. Individuals have begun to manage and carry out all their work through mobile devices. This situation has triggered social changes among individuals. This has also led educators to perceive themselves as more competent in using devices in educational activities (Yuksel 2013; Bisgin 2014). At this point, as a result of familiarity with digital devices, a tendency to use them in occupational life has emerged. A study revealed that a connection developed between individuals and these devices since they were willing to use them (Reeves and Nass 1996). When considering this from the perspective of teachers, the use of technology in educational activities has gained more importance. Teachers think that knowledge can be transferred more effectively through these devices. This is also valid for learners at younger ages who were born in the digital age and which one refers to as 'digital natives'. As mentioned before, this situation leads to major advantages for individuals with disabilities and they also improve from many dimensions through these devices.

Teachers must effectively use technology in education in these days. At this point, the im-

portance of teachers and students being technology literate has arisen (Ozdamli and Uzunboylu 2014). Technology has an active and effective role in life in these days. Technology renews itself each passing day and it is used to fulfill the requirements of individuals in both everyday life and education environments (Van Wyk and Louw 2008).

When technology is used in education environments, it contributes to the enrichment of the learning activities for both teacher and student (Chang 2010). Teachers can create effective teaching environments through supporting their topics with technology (Turan 2010). It would be beneficial to use technology in special education since it would facilitate the work of teachers. Individuals with special needs could understand, use and keep up with innovations, and the lessons would be in line with technological advancements.

There are examples of research in the last few years related with assisted technologies such as tablet computers, smart board applications, laptops, cloud technology applications and instructive robots, which would give direction to the use of assisted technology in special education (Liu et al. 2013; Aziz et al. 2012; Arpacik 2014; Tapus et al. 2012).

When selecting the materials and education environment that will be used in the education of individuals with special needs, individual characteristics should be considered. For example, materials should be selected and prepared according to the individual characteristics. At this point, selection of appropriate material in the education of individuals with special needs is really important. Assistive technologies have the potential to be of benefit to children and young people with learning difficulties or autistic spectrum disorder (Yildiz 2010).

Learning disabilities sometimes originate from impairments to information processing and these students might experience difficulties in various domains such as reading, writing and arithmetic. The causes of learning disabilities may be related to visual processing, auditory perception or memory (Lopesti et al. 2008). From this perspective, it could be argued that these students need technology much more when compared to typically developing students. Book and materials may be limited in the education of these students. Their attention might be sustained more when using a digital device.

Teachers working at special education schools stated that use of technological devices in special education would provide acquirements in many domains. Teaching subjects with vocal, dynamic and interesting materials in technological environments would be very beneficial for students and increase their motivation (Arpacik et al. 2013).

Besides these positive effects of computers on individuals with disabilities, other computer technologies have emerged with other technological advancements that may be useful for the development of individuals with disabilities in education and other domains. However, it should be noted that some individuals, who may have low functioning autism, find it difficult to use certain equipment without support. At this point, tablet computers may provide many advantages to children with autism, such as ease of use and understanding through the touch-operated screens (Harwood 2010; Melhuish and Falloon 2010; Baran and Beyazgul 2013; Celik 2013).Tablet computers stand out as mobile devices, which are mostly used in education in recent years (Korkmaz 2010; Ates 2011). There are many applications in tablet computers that may be used by children with autism (Elicin and Tunali 2016).

Tablet computers are one of the most recent innovations in recent years. There are mobile communication technologies including Personal Digital Assistant (PDA), mobile phones, smartphones and tablets (Thiam 2013). Tablets can add information onto the screen by using digital ink technology. According to research, tablets are preferred in education as a teaching tool. It was indicated that tablets facilitate learning by increasing students' interest, desire and curiosity towards the learning activity and providing a rich education environment for both teachers and students (Gunduz 2010; Aksal 2011; Delen and Bulut 2011; Guzel 2011). These students and teachers should receive permanent support and education in order to overcome any difficulties in using technology based on their proficiency in using tablet PCs (Savas 2013). The importance and necessity of producing applications and materials have emerged.

It can be seen as a large deficiency that teachers do not currently benefit from technological devices in special education centers and mainstream classrooms in North Cyprus. If materials or technological devices to be developed were qualified for using in the education of individu-

als with special needs, this would provide many benefits for the personal and academic development of these individuals (Elicin and Tunali 2016). Based on the literature, it can be concluded that individuals with special needs have different requirements when compared to individuals without disabilities. This situation is important for all education activities of individuals with disabilities. At this point, it is essential to convey the best education services to these individuals by using the advantages provided by technology at the maximum level so that they may benefit from these opportunities (Cope and Ward 2002). Therefore, it is important to reveal the use of assisted technologies in special education by examining the views of special education teachers and determining their awareness towards these technologies.

Problem Statement

What is the usage statement of the tablet computers by teachers as an assistive instruction tool in special education field during educational activities?

Objective of the Research

This study aims to determine the views of special education teachers regarding the use of technological devices in special education. In addition, this study aims to figure out the problems and needs of special education teachers on technology usage in education. In line with this aim, answers to the following questions were sought in this study:

1. What technological devices are available and which of these do teachers use in school?
2. For what purposes does one use technological devices?
3. What are the advantages of a tablet PC being used in special education?
4. What are the disadvantages of a tablet PC being used in special education?
5. What applications and programs does one use as teaching tools?
6. For which disabled group(s) does one use the tablet PCs most for teaching?
7. What are the problems one encounters while using applications during the teaching process?
8. What problems do one experience while using the application during teaching process?
9. What are the suggestions for a new tablet application for special education?
10. In which areas does one use tablet applications?
11. Does one use any tablet applications in the Turkish language?
12. In which subjects would one prefer to use tablet applications?

Significance of the Research

In the light of the findings from this research, special education teachers will gain their awareness on usage of the assistive technological devices in educational activities. While teachers use the tablet computers as assistive educational material in instruction, teachers will learn about advantages and disadvantages of the tablet computer usage in special education area and results of the study will lead to other teachers who are willing to use such technological devices in their teaching process. In addition, in terms of multimedia designer they will learn more information from teachers about experienced problems, learning skills and features of the disabled students that teachers worked with.The research is expected to guide all special education teachers with respect to assistive technology usage in the special education area and also expected to guide all multimedia designers with respect to software development for students who have different disabilities.

METHODOLOGY

Population and Sample

The study group included a total of fifty-two teachers from the cities of Nicosia, Morphou, Kyrenia and Famagusta in North Cyprus. Thirty-one of these teachers were female and twenty-one of them were male. Fifteen of the teachers were working at a private special education school and thirty-seven were working at a governmental special education school. Only three of the teachers had attended training about technology use in special education and forty-nine of the teachers have never attended any relevant training. In addition, although twenty-five of the teachers were using tablet PCs, twenty-seven were not using tablet PCs in education.

Research Model

This research is a descriptive case study. The semi-structured interview method, which is ap-

propriate for qualitative research methods, was used to collect the data. This method was used in order to reveal the views of the study group in depth for the use of tablet computers in special education.

In this study, a semi-structured interview form was developed to obtain the views of special education teachers about technology use in special education. Five academic experts in their fields were consulted for the validity and preparation of the interview forms. An interview schedule was prepared together with the administrative authorities. All interviews were conducted face-to-face between the dates of 3rd April 2015 and 25th April 2015. Data collected during the interviews was recorded both in written and audio format.

Special education teachers are trying to use such devices to support their teaching in North Cyprus. However, there is still a lack of research for determining the needs and problems which teachers experience when using technology in education. It is also necessary to determine the kinds of technological devices they use when teaching. Before conducting the interviews with teachers, a consent form was obtained from the Ministry of Education by the researcher. All of the interview dates and times were planned with teachers. Interviews were done individually and audio recorded. Furthermore, a written informed consent form was given by the teachers for the interviews.

Descriptive analysis was applied to the qualitative data collected throughout the research. Descriptive analysis was applied following steps, including coding of the data, identification andorganization of themes, and finally, identification and analysis of findings. In addition, data frequencies were quantified and represented with tables.

RESULTS

In this section, the views of teachers about the use of technological devices in special education are presented. Codification and tabulation of the obtained data, based on the interviews, is presented.

Technological devices used by teachers in school are demonstrated in Table 1. As can be seen, computers and tablet PCs are the most used devices by special education teachers. These devices enable more interaction than other devices for disabled children during teaching activities. According to teachers, projectors are also used in education activities. In addition, teachers indicated that radio and television are still being used for teaching activities.

Table 1: Technological devices used by teachers

Technological devices	*f*
Computer	48
Tablet	32
Projector	12
Radio	9
Smart Board	3
Smart Phone	3
TV	1

The purposes of technological devices in education, as indicated by teachers, are listed in the Table 2. As can be seen, playing videos is the most used activity in class. Disabled children are, like their typical peers, highly likely to be motivated by subjects that are taught through the medium of animation and cartoons. Teachers also stated that they use computers to prepare teaching materials for their personal work. Furthermore, different kinds of voices can be taught with computers. Teachers also indicated that, since tablets easily get the attention of the

Table 2: Purposes of using technological devices at school by teachers

Views	*f*
Computer	
Playing video	20
For preparing teaching materials or personal needs/purposes	18
Types of sounds teaching	16
Playing music to students	15
For spelling and reading exercises	12
Showing visual materials	8
Tablet PC	
For reinforcement and meed after the instruction	23
For teaching activities	22
Playing game	14
Playing video	14
Playing music	10
For fine-motor muscle development with finger use	9
Attention	7
Projection	
Playing video	5
Reading exercises	3
Showing visual materials	2
Radio	
Types of sounds teaching (animals, vehicles)	2
Recording students' voices and listening their own voices	2
TV	
Playing video	1

children, tablet devices are mostly used for reinforcing and rewarding the students when they are successful. In addition, tablet PCs are used for teaching some topics by teachers. Some of the teachers stated that tablet PCs are used for playing games and having fun during leisure time with the teachers' permission. Projectors are mostly used for showing visual materials and playing videos to the students.

The advantages of tablet PC use in special education, as indicated by special education teachers, are presented in Table 3. Teachers mostly stated that students are more focused on tablet PC applications and tablet PCs direct their attentions toward lessons. Tablets tend to have flashy visuals and interactive animation. Teachers indicated that the touch screen function of tablet PCs is another advantage since they provide effective interaction for disabled students during their education. Getting feedback from tablets positively affects students' improvement in education. Tablet PC use also makes learning easier since it triggers the five senses of students.

Table 3: Advantages of tablet PC use in special education

Views	*f*
Students are more focused on tablet PC applications and tablet PC's easily gain their attentions toward lessons.	24
Tablets provide effective interaction through touchable use of tablet PC's.	18
They makelearning easier with five senses.	15
Visual materials in tablet PC's are colourful and desirable and these visuals increase their interest during lessons.	14
Tablet PC's offer variety of materials.	14
They increase the retention of knowledge.	13
Touchable use makes these devices more useful for disabled students.	13
They increase thenumber of order-taking behaviours.	11
They facilitatehand-eye coordination.	10
They develop fine-motor muscle with finger use.	10
Aggressive students becomecalmer during tablet PC usage.	9
They increase self-confidence through matching and touching activities in tablet PC.	8
Students have familiarity with tablet PC's because of the smart phones that their parents generally use.	6

The disadvantages of tablet PC use in special education, as pointed out by teachers, are listed in Table 4. As shown, teachers' biggest concerns regarding education with tablets is that the usage time of tablet PCs must be set very well during education. Otherwise, disabled students can become addicted to tablet PCs. Teachers indicated that the high price is another important disadvantage of tablet PCs. Because of this reason, tablet PCs are rarely found at schools. Most of the teachers stated that the disadvantages of tablet PC use in special education completely depend on the teachers. If teachers can manage to set the usage duration of tablets, then there would be no disadvantages of tablet PC use in special education.

Table 4: Disadvantages of tablet PC use in special education

Views	*f*
Duration of usagemust be set very well	27
Expensive price	12
Disadvantages depend on the teachers	12
Education as group work is not very possible	8
They might limit teachers' creativity.	6
Giving tablet PC's to students at home by parents decrease students' attentions during lessons towards tablet PC's.	4

Applications and programs on computers used by teachers as teaching material are listed in Table 5. Teachers generally use educational programs or games from the Internet. Some teachers stated that they use educational preschool CDs for teaching activities.

Table 5: Applications and programs used by teachers as teaching tool

Views	*f*
Using educational games from internet	9
Pre-school educational CDs	6
Concept teaching CDs	3

Teachers' opinions regarding the disability groups in which tablet PCs are used most for teaching are listed in Table 6. Teachers stated that the disability group in which tablet PCs are used most for teaching is autism and the second disability group is Down's syndrome.

Table 6: Used disabled groups for teaching with tablets

Views	*f*
Autism	25
Down Syndrome	19
CP	18
Mild mental disability	9
Dyslexia	9

Teachers' opinions regarding the problems that they encounter when using applications are provided in Table 7. Most of the teachers compl-ained that applications are in English and they can only use the visual parts of the applications. Another important problem is the design of the applications since they have unnecessary visuals, which disrupt children's attention. In addition, teachers indicated that updates and advertisements in the applications interrupt the teaching process.

Table 7: Encountered problems by teachers

Views	*f*
Applications are in English and we only use their visuals.	23
Design of the applications has unnecessary visuals and they disrupt children's attentions.	18
Updates and advertisements of the applications interrupt the teaching.	12
Applications are only working via internet.	10
Objects should change randomly in every page, otherwise children memorize the place of the objects.	7
Applications should definitely have effective feedbacks and reinforcements.	4

General suggestions of the teachers for newly developed tablet applications are listed in Table 8. Teachers mostly suggested that realistic visuals should be used in applications for children to understand better. Another suggestion of the teachers is that applications should be developed with special education teachers who are experts in this area. Teachers also indicated that applications must work independently from the Internet. Another suggestion is that visual objects must be simple and understandable.

Table 8: General suggestions of the teachers for newly developed tablet applications

Views	*f*
The realistic visuals should be used in applications for children to understand better.	24
Applications should be developed with special education teachers who are expert in this area.	21
Applications must be able to work independently from the internet.	18
Visual objects must be simple and understandable.	16
Sounds in the applications should not be scary.	13
Developers should consider the cultural differences for visual objects.	8
Technical problems should be minimized.	6

Teachers' opinions regarding the study areas of tablet applications are listed in Table 9. Teachers stated that concept teaching is the most used teaching subject. Teachers also use tablets for communication skills. Social skills teaching is another subject practiced with tablet applications.

Table 9: Study areas of tablet applications

Views	*f*
Concept teaching (for instance: Colours, numbers, objects, geometric shapes etc.)	18
Communication skills	16
Social skills	12
Tale completion (for instance: separate or match objects)	9
Science	6
Daily living skills	5

Teachers' opinions about tablet applications in Turkish are listed in Table 10. The teachers mostly stated that they cannot find any specific educational applications in the Turkish language. Teachers indicated that they are using foreign applications in English and are obliged to turn off the sound and only use the visual element of the applications. Nevertheless, teachers stated that applications in Turkish have not yet been developed specifically for children with special needs and they are more appropriately designed for children without disabilities. Designs in these applications are very complicated for disabled children and they might have difficulties in understanding them.

Table 10: Views of the teachers about tablet applications in Turkish

Views	*f*
We cannot find any specific educational application in Turkish language.	22
We are using foreign applications in English while switching off the sounds of them and using only their visuals.	18
Applications in Turkish have not been developed yet specifically for children with special needs, they are more appropriately designed for children without disability. Designs in these applications are very complicated for disabled children and they might have difficulties in understanding them.	17

Teachers' opinions regarding specific subjects that they prefer to use tablet applications within are demonstrated in Table 11. Teachers stated that they mostly need educational appli-

cations for concept teaching in the area of special education. Another subject preferred by the teachers is communication skills teaching. In addition, teachers indicate that social skills teaching is another important subject for newly developed tablet applications.

Table 11: Subjects preferred by the teachers to be taught with tablet applications

Views	*f*
Concepts	24
Communication skills	22
Social skills	21
Academic skills	19

DISCUSSION

When one looks at the general results, one sees that teachers are volunteers in using technology in educational activities. When considering this from a digital anthropological perspective, humans have gained familiarity with technological devices, and started to use them as educational tools, ever since humans have consistently used social media and such environments. The results showed that teachers generally try to use various technological devices in education for personal purposes and educational activities. Teachers mostly use computers and tablets as teaching tools in education. When looking at the technological devices of the schools, most had computers and projector devices available for use by the staff. In addition, only two schools had tablet computers and smart boards. The computers were mostly used to play videos to children, prepare teaching materials for lessons, personal purposes, types of sounds teaching, and playing music to students. On the other hand, tablets are mostly used by teachers for reinforcement and to reward children after instructional activities. It has been revealed that computers and tablets are the most frequently used devices in educational activities by teachers. This reveals an anthropological dimension of technology as well. One knows and observes that individuals use these devices for various purposes in daily life. In addition, tablets are mostly used for teaching by teachers. Teachers also give the tablets to students for playing games, music and videos. In terms of the physical development of children, teachers stated that tablets with touchable screens have the potential to improve fine motor skills of children. Another teacher had used the projector as an assistive tool in teaching. This device is generally used to play videos or show visual materials in a bigger version to students. Radios and televisions are also still being used by teachers for educational activities. However, teachers stated that they are not interactive enough for children and they can only be used for listening to or watching things (Hasselbring and Williams 2000; Michaels and McDermott 2003; Dell et al. 2008; Judge and Simms 2009; Dempsey et al. 2010).

In terms of the advantages of tablets in special education, teachers stated that the benefit of using tablets is that they can help children stay more focused and direct their attention toward lessons because of the interactive visual material in tablets. In addition, tablets make learning easier with five senses for children with disabilities. Colorful and desirable visual materials can increase the interest of children during lessons. One interesting view of the teachers was that children with emotional and behavioral difficulties seemed to become calmer during tablet use (Anderson and Petch-Hogan 2001; Kleopatra 2009; Lucassen et al. 2010; Flanagan et al. 2013). It could be argued that children interact with these devices used by individuals in the environment, consciously or unconsciously, and establish a connection with these devices. Therefore, when children see these devices in lessons, they become more willing and their interest increases because of the previously established connection.

When looking at the disadvantages of tablet use in special education, teachers mostly stated that duration of usage must be strictly monitored and limited, otherwise children might become addicted to tablets. Teachers also complained about the expensive price of the tablets. Interestingly, six of the teachers stated that tablet usage might limit the teachers' creativity in terms of material preparation. Another different opinion stated by the teachers is that giving tablets to children at home by parents decreases attention of children during lessons towards tablets. When looking at the educational applications or programs used by teachers, they only use some programs on computers from the Internet or CDs for educational activities.

In terms of disability groups, teachers mostly use technological devices for children with autism. The existing literature suggests that chil-

dren with autism are more motivated by technological devices than their typical peers or their peers with other forms of disability (Gentry et al. 2010). However, teachers generally stated that they use tablets and other technologies for all disability groups, to make lessons more efficient (Shah 2011; Fernandes et al. 2010; Hammond et al. 2010; Venkatesh et al. 2012).

One of the most frequently encountered problems during the teaching process by teachers is that the applications are in English. Therefore, teachers are obliged to use only the visual parts of the applications. There are not enough applications in the Turkish language. Another stated problem is that the design of the applications has unnecessarily complex visuals and these may disrupt the attention of children and limit their ability to understand. In addition, updates and advertisements of the applications interrupt the children's attention towards lessons. Teachers indicated that they want to use applications that do not require an Internet connection but most applications only work via the Internet and this is a big disadvantage for them. Few teachers stated that applications should have effective feedback and reinforcements, otherwise applications will not be useful enough for teachers and children (Shah 2011; Fernandes et al. 2010; Elicin 2015).

Teachers suggested that newly developed educational applications must have realistic visuals in educational applications for children to understand better. Teachers stated that educational applications should definitely be developed in collaboration with special education teachers who are experts in this area. Teachers and programmers should work together in a multidisciplinary way. Visual objects in applications must be simple and understandable. Materials in applications that have scary objects or sounds might affect children with autism since they are more sensitive to such disturbing things. It is easy for children with special needs to lose their concentration or attention towards lessons because of these problems. Hence, the teachers stated that applications must be developed in collaboration with special education teachers who are experts in their fields. Another important view was that developers and specialists must consider the cultural differences for visual objects. For instance, when using applications, which have been developed in a foreign country, the clothes of the police may appear different. When children realize this, it may be confusing for them and they might start to tell the teachers that, for example, they are firemen not police because of the difference in clothing.

Teachers support the development of materials, which can be used in technologies based on the familiarity and voluntariness that they observe among children. They also indicated that this would be beneficial for both teachers and students. The effect of digital environments for both students and teachers in education, as in all areas, can be clearly seen based on the results.

When the researchers asked teachers about which areas of study they use tablet applications in, teachers generally stated that they use tablet applications for concept teaching to children. Some concepts might be teaching colors, numbers, objects, geometric shapes and so on. Following this, communication and social skills are another two important study areas used with tablet applications. However, as indicated before, these applications are all in English and teachers only use the visuals in their lessons (Rossing et al. 2012; Elicin and Tunali 2016).

Teachers indicated that there are an insufficient number of applications in Turkish and it is difficult to find educational applications that have been specifically developed for children with disabilities.

The subjects that teachers said they would most like to see applications developed in Turkish were concepts, communication skills, social skills and academic skills. Concepts are important for children during their development and tablets are useful for teaching because of their interactive learning environment. Teachers mentioned that they are using tablets for teaching basic concepts, such as big-small, long-short, little-much and thick-thin (Rossing et al. 2012; Viriyapong and Harfield 2013).

CONCLUSION

In conclusion, digital devices, which are used by all human societies these days, affect the area of education from a digital anthropological perspective. Teachers indicated that positive consequences of this effect could be achieved through specific applications developed for these devices. Teachers try to use these devices as part of their own planning and mostly think that these devices are effective. When consid-

ering things from the perspective of children, they benefit from using technology because they gain familiarity with digital environments, and teachers indicated that children are more interested in materials presented through digital devices and educational environments.

REFERENCES

Anderson CL, Petch-Hogan B 2001. The impact of technology use in special education field experience on pre-service teachers' perceived technology expertise. *Journal of Special Education Technology*, 16: 27-44.

Arpacik O 2014. *The Effectiveness of Multimedia Development Process on Teachers and Mental Disabled Kids*. PhD Thesis. Educational Sciences Institute. Erzurum: Ataturk University.

Aksal FA 2011. Developing evaluative tool for online learning and teaching process. *TOJET: The Turkish Online Journal of Educational Technology*, 10(3): 69-75.

Arpacik O, Kursun E, Goktas Y 2013. The Experience of Convenient Content Development for Mentally Disabled Kids. *International Instructional Technologies and Teacher Education Symposium*, Karadeniz Technical University, Trabzon, 26 June 2013.

Ates V 2011. *The Review of Contribution of Mobile Technologies on Education Process: An M-Learning Application on Numerical Design Course.* Master Thesis, Unpublished. Information Institute. Ankara: Gazi University.

Aziz KA, Aziz NAA, Yusof AM, Paul A 2012. Potential for providing augmented reality elements in special education via cloud computing. *Procedia Engineering*, 41(0): 333-339.

Baran B, Beyazgul G 2013. The Experience of Educational Software Design and Development by Computer Education and Instructional Technology Students. *EngelsizBilisim 2013 Symposium*, Istanbul University, Istanbul, 12 September 2013.

Bisgin H 2014. Analyzing the attitudes of physical education and sport teachers towards technology. *Anthropologist*, 18(3): 761-764.

Braddock D, Rizzolo MC Thompson M, Bell R 2004. Emerging technologies and cognitive disability. *Journal of Special Education Technology*, 19(4): 1-14.

Celik B 2013. The Usage of Advance Assistive Technologies on Autistic Kids. *Engelsiz Bilisim 2013 Symposium*, Istanbul Universitesi, Istanbul, 12 September 2013.

Chang CW, Lee JH, Chao PY, Wang CY, Chen GD 2010. Exploring the possibility of using umanoid robots as instructional tools for teaching a second language in primary school. *Educational Technology and Society*, 13(2): 13–24.

Cope C, Ward P 2002. Integrating learning technology into classrooms: The importance of teachers' perceptions. *Educational Technology and Society*, 5(1): 67–74.

Delen E, Bulut O 2011. The relationship between students' exposure to technology and their achie-vement in science and math. *TOJET: The Turkish Online Journal of Educational Technology*, 10(3): 311-317.

Dell AG, Newton DA, Petroff JG 2008. *Assistive Technology in the Classroom: Enhancing the School Experiences of Students with Disabilities*. Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.

Dempsey JV, Lucassen B, Haynes L, Casey M 2010. Instructional Applications of Computer Games. *ERIC Document Reproduction Service* No. ED394500.

Elicin O, Tunali V 2016. Children with autism progressive gaining effectiveness of the tablet PC schedule use of assisted skills. *Egitimve Bilim*, 41: 183 29-46.

Eliçin O 2015. *Autism Spectrum Disorder the Effective-ness of the Programs Offered Through the Tablet Computer for Children to Acquire Functional Reading Skills*. PhD Thesis, Published. Educational Sciences Institute. Bolu: Abant Izzet Baysal University.

Fernandes FD, Santos TH, Amato CA, Molini-Avejonas DR 2010. Computerized resources in language therapy with children of the autistic spectrum, *Pro Fono*, 22(4): 415–420.

Flanagan S, Bouck EC, Richardson J 2013. Middle school special education teachers' perceptions and use of assistive technology in literacy instruction. *Assistive Technology: The Official Journal of RESNA*, 25(1): 24-30. DOI: 10.1080/10400435.2012. 682697.

Gentry T, Wallace J, Kvarfordt C, Lynch KB 2010. Personal Digital assistants as cognitive aids for high school students with autism: Results of a community-based trial. *Journal of Vocational Rehabilitation*, 32: 101–107.

Gunduz HB 2010. Digital divide in Turkish primary schools: Sakarya sample. *TOJET: The Turkish Online Journal of Educational Technology*, 9(1): 43-53.

Guzel H 2011. Factors affecting the computer usage of physics teachers working at private training centers. *TOJET: The Turkish Online Journal of Educational Technology*, 10(2): 122-132.

Hammond DL, Whatley AD, Ayres KM, Gast DL 2010. Effectiveness of video modeling to teach iPod use to students with moderate intellectual disabilities. *Education and Training in Autism and Developmental Disabilities*, 45(4): 525–538.

Harwood J 2010. *Assistive Technology and the Self-esteem of Students with Learning Disabilities*. Master Thesis, Unpublished. Ontario: Lakehead University.

Hasselbring TS, Williams CH 2000. Use of computer technology to help students with special needs. *Children and Computer Technology*, 10(2): 102–122.

Heather H, Miller D 2012. *Digital Anthropology*. London and New York: Berg.

Judge S, Simms KA 2009. Assistive technology at the pre-service level. *Teacher Education and Special Education*, 32: 33–44.

Kleopatra N 2009. Early childhood educational software: Specific features and issues of localization. *Early Childhood Education Journal*, 35(2): 173-179.

Korkmaz M 2010. *The Effectiveness of Problem Based Mobile Learning on Undergraduate Student Success*. Master Thesis, Unpublished. Istanbul: Istanbul Universitesi.

Liu GZ, Wu NW, Chen YW 2013. Identifying emerging trends for implementing learning technology in special education: A state-of-the-art review of se-

lected articles published in 2008-2012. *Research in Developmental Disabilities*, 34: 3618-3628.
Lopresti EF, Bodine C, Lewis C 2008. Assistive technology for cognition [Understanding the needs of persons with disabilities]. *IEEE Engineering in Medicine and Biology Magazine*, 29-39.
Melhuish K, Falloon G 2010. Looking to the future: M-learning with the iPad. *Computers in New Zealand Schools: Learning, Leading, Technology*, 22(3): 2-15.
Michaels CA, McDermott J 2003. Assistive technology integration in special education teacher preparation: Program coordinators' perceptions of current attainment and importance. *Journal of Special Education Technology*, 18: 29-41.
Ozdamli F, Uzunboylu H 2014. M-learning adequacy and perceptions of students and teachers in secondary schools. *British Journal of Educational Technology*, 46(1): 159-172.
Reeves B, Nass C 1996. *The Media Equation: How People Treat Computers, Television, and New Media Like Real People and Places*. Cambridge, UK: Cambridge University Press.
Rossing JP, Miller WM, Cecil AK, Stamper SE 2012. I Learning: The future of higher education? Student perceptions on learning with mobile tablets. *Journal of the Scholarship of Teaching and Learning*, 12(2): 1–26.
Savas P 2013. Tablet PCs in English language teaching: Benefits and challenges. *Global Journal on Technology*, 4: 602-607.
Shah N 2011. Special education pupils find learning tool in iPad applications. *Education Week*, 30(22): 1-4.
Tapus A, Peca A, Aly A, Pop C, Jisa L, Pintea S, Rusu A, David D 2012. Children with autism social engagement in interaction with Nao, an imitative robot: A series of single case experiments. *Interaction Studies*, 13: 315-347.
Thiam MY 2013. Role of information technology in agriculture. *Global Journal of Information Technology*, 3(2): 27-30.
Tsun KW 2000. *Research of Elementary Fourth Grade Students' Two-dimension Concept Development*. Thesis of Life Application. Wen-Hua, Taiwan: Science Department of Wen-hua College.
Turan I 2010. Student readiness for technology enhanced history education in Turkish High Schools. *Cypriot Journal of Educational Sciences*, 5(2): 94-106.
Williams P 2011. Barriers to the creation and use of an accessible web portal for people with learning disabilities. *International Journal of Education*, 3(2): e21.
Van Wyk G, Louw A 2008. Technology-assisted reading for improving reading skills for young South African learners. *The Electronic Journal of e-Learning*, 6(3): 245-254.
Venkatesh S, Greenhill S, Phung D, Adams B, Duong T 2012. Pervasive multimedia for autism intervention. *Pervasive and Mobile Computing*, 8(6): 863–882.
Viriyapong R, Harfield A 2013. Facing the challenges of the one-tablet-per-child policy in Thai primary school education. *Education*, 4(9): 23-32.
Yildiz S 2010. Opening a door for disabled people via knowledge and communication technologies. *Journal of International Social Researches*, 3(11): 612-620.
Yuksel D 2013. Technology use in reflective teaching: A practicum research project. *The Anthropologist*, 16(1-2): 145-152.