



Teachers' attitude towards, and knowledge of, the use of technology for the education of children with special needs in Turkey

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ABSTRACT

This research investigates teachers' knowledge of, and attitudes towards, the use of ICT in special education. ICT has been used to support the different requirements of students with special needs (e.g. social skills and those of communication, maths and literacy), with previous research having established positive outcomes. The attitudes of teachers towards the use of ICT, along with their knowledge of its applications, play a key role in integrating ICT into classroom activities. This study is based in Turkey and focuses on 8 teachers with experience of working with students with special needs, 5 being from an inclusive school and 3 from a rehabilitation centre for special education. The participants have been interviewed, and the interviews then thematically analysed. The findings are interpreted in relation to the literature focussing on ICT applications for special education, along with teachers' perceptions, knowledge and attitudes concerning the use of ICT for special and inclusive education. The findings demonstrate that teachers hold positive attitudes towards the use of ICT, and make use of it for both inclusive and special education. They demonstrate a willingness to use ICT to support children with special needs, and to promote a more effective use of ICT in the future. They identify the need for support from schools, along with pedagogical training to overcome a lack of skills, and the foundation, and policies, to integrate and adapt ICT for special education.

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1 CHAPTER: INTRODUCTION

The emphasis on inclusion in relation to special needs education has increased educators' interest in utilising different ICT applications as an integral aspect of special education (Williams et al., 2006). ICT can be used to create opportunities to educate children with Special Educational Needs (SEN) in a more effective and efficient manner, and enhance their potential to become active learners in classroom settings (Messinger-Willman and Marino, 2010). Moreover, ICT can enable learners with special needs to improve at their own pace, including through specialising and differentiating each task, based on individual needs. This permits the educator to facilitate, diversify and provide rich educational activities for students with special needs (Williams et al., 2006). The use of ICT in a classroom environment can therefore increase the participation of all children with different needs.

Certainly, previous studies show ICT can facilitate the education of students with special needs by providing them with engaging and personal activities (Harris, 2010). Children demonstrate an interest in computer technology and Internet based applications, which can thus be used to increase their motivation and attention (Johnson and Hegarty, 2003). However, simply having access to ICT may not necessarily result in any educational outcomes, particularly if it is not adapted, or integrated, into educational activities to facilitate the needs, and reinforce the strengths, of students (Foley and Ferri, 2012; Chadwick et al., 2013; Johnson and Hegarty, 2003). However, there are a number of technical ICT requirements (e.g. ICT devices, an Internet connection or relevant software and programmes) that can prove difficult for some schools and families to fulfil (Harris, 2010; Chadwick et al., 2013).

During its integration into schools, ICT has been utilised to support the different needs of students with SEN in a number of different ways. ICT has been primarily employed to support and improve maths, and social, communication and literacy skills (Liu et al., 2013; Kuegel, 2014). Researchers and educators have indicated that video-modelling is

an effective method of supporting those needs, as it allows educators to create opportunities to present curriculum subjects that are relatively time and effort consuming to study in the classroom. In addition, mobile technology (i.e. the tablet) is also being utilised for special education, in order to promote similar skills (McNaughton and Light, 2013; Mintz et al., 2012). This can allow the adoption of the video-modelling method and applications for communication purposes, e.g. speech generating devices or picture based communication systems (Sigafoos et al., 2014). At the same time, when used as the primary digital device, computers can be employed to promote the above skills, alongside collaborative learning opportunities for students.

Despite the fact that ICT offers promising educational activities and outcomes, its adaptation and integration requires more than simply the presence of ICT and ICT based educational methods (Nam et al., 2013). The effectiveness of ICT in classroom relies primarily on pedagogy and the personal efforts of teachers. Teachers' attitudes and perceptions (along with their computer skills, and technical and pedagogical training in relation to ICT) are significant in the effective integration of ICT into teaching and learning activities. Therefore, teachers play a key role in integrating ICT into classroom activities, particularly for students with additional needs, since fulfilling the learning requirements of such students while dealing with the additional burden of the effective use of ICT, places additional responsibility onto teachers (Jeffs et al., 2003).

As a developing country, Turkey has invested in educational programmes to improve its education system (Akbaba-Altun, 2006; Demiraslan and Usleel, 2008; Özdemir and Kılıç, 2007). One of two educational components on which the Ministry of National Education (MONE) has focussed, concerns both the use of ICT and special education. In recent years, MONE has revealed a number of policies for special and inclusive education, although there has been a longer history of a focus on ICT. Despite a number of practical issues, the policies in relation to special education have led to some improvements (Melekoglu et al., 2009; Eres, 2010). Since MONE has also been interested in developing its use in all schools, ICT can also be utilised to enrich special education in terms of

practice. The greatest responsibility for its achievement is placed on teachers, leading to a need to examine their attitudes towards ICT for special needs, in order to identify issues and provide possible solutions.

Therefore, this study investigates teachers' attitudes, and perceptions, towards the use of ICT for students with special needs, leading to the following research questions.

1.1 Research Questions

This study investigates the perceptions, beliefs and attitudes of teachers towards the use of ICT for students with special needs. As stated above, ICT can be used to enrich teaching and learning processes for students with special needs in gaining social skills, along with those of communication, maths and reading. The relationship of teachers towards ICT and special needs students has also been examined. This has led to the conclusion that a number of contextual factors may influence teachers' use of ICT for special needs. These vital points have led to the following research questions:

1. What are the perceptions and attitudes of teachers towards the use of ICT for students with special needs?
2. What are the enablers and barriers that teachers encounter in using ICT for students with special needs?
3. What are teachers' current use of, and future projections for, the integration of ICT for students with special needs?

The following section is organised as follows: firstly, there is a literature review; secondly, there is an analysis of the uses of ICT in special needs education to promote social, communication, maths, and literacy skills; thirdly, there is an examination of the role of teachers in relation to ICT, and their perceptions and attitudes towards its use in special education; fourthly, this is put into perspective in relation to the general picture of special education and ICT in Turkey; fifthly, the research design chapter outlines the following qualitative methods: the semi-structured interview; sampling strategy; ethical

issues; data collection procedure; data analysis; sixthly, there is a discussion of the findings of interviews, along with a discussion in relation to the literature. Finally, there is a conclusion.



2 CHAPTER: LITERATURE REVIEW

This chapter focuses on a review of the literature concerning ICT, special education and teachers. Firstly, there is an illustration of the use of ICT in special education by means of a number of empirical studies demonstrating the ways in which ICT can assist students with Special Educational Needs (SEN). Secondly, there is an examination of the use of ICT in schools, including the key role of teachers in the integration of ICT. Thirdly, the role of teachers in using ICT for students with SEN is addressed. Finally, there is a brief outline of the background of ICT and special needs policies in relation to Turkey.

2.1 ICT and Special Education

The rapid development and impact of Information and Communication Technology (ICT) over recent decades, has inevitably led to studies focussing on its integration into education, including with primary school children with SEN. At the same time, the umbrella term 'assistive technology' has been used in education to refer to the provision of the necessary support to enable SEN children to benefit from education, and to create the least restrictive environment (Causton and Theoharis, 2014). Within assistive technology, the majority of available digital technologies (including computers, and mobile devices) have been used for various pedagogical purposes.

The use of ICT for teaching social skills has been investigated by Reed et al. (2011), who have established that ICT can promote social problem solving, the making of friends, improve play and peer relationships, as well as enhancing the regulation of emotion. Furthermore, educators have been using computer programmes and software (e.g. iPad applications, and video-modelling) in order to support children's differing skills (Causton and Theoharis, 2014), including: pre-academic skills; matching shapes, colours or letters (Hitchcock and Noonan, 2000); literacy skills; reading and writing skills (King-Sears et al., 2011; Delano, 2007); communication skills (Waddington et al., 2014; Lorah et al., 2013). Furthermore, computers can be used as game tools to improve the different skills

of children with SEN. Therefore, computer technology can give opportunities to create and present different educational games for different needs and skills.

Pennington (2010) has reviewed the use of computers as a learning tool for children with autism. This review includes 15 studies investigating a number of literacy skills, 8 of which are related to reading skills, and 7 are related to the learning of vocabulary. The targeted skills in these studies are as follows: sentence construction; vocabulary; matching words to a sample; decoding and meta-cognitive strategies; essay writing; matching animal and letters to a sample; spelling; sight word reading; and constructing and reading. The different use of computer technology during the investigations under review concluded that the participants improved their academic skills, thus demonstrating that computers can be effective in teaching a number of academic skills for children with special needs.

A number of empirical studies have been analysed in order to address some of the above uses of ICT for special needs. Hitchcock et al., (2004) investigated the use of video modelling with 4 students with special needs, in order to promote reading fluency and comprehension. The children undertook a 30-minute session with a tutor in order to increase their reading fluency, and were videotaped when they read fluently. Before each session, the children watched their videos, using them as guidance until they reached their own criterion of reading fluency. When students reached a stable level for reading fluency, they implemented a similar process to increase reading comprehension. Students were videotaped when they reached the required comprehension level. The tutoring continued with the video-modelling, until students achieved stable data, i.e. their own criterion of reading comprehension. Teachers indicated that students gained the targeted skills, which they maintained both in the classroom and at home.

In a separate study, iPads were used for video self-modelling, in order to improve the maths skills of 3 male students with autism, and one male student with intellectual disabilities. The study indicated that the students succeeded in estimating the amount of

money for a purchase, and receiving the change (Burton et al., 2013). The interventions include: the process of identifying the price; estimating the amount to be paid; giving money to teachers; estimating the amount of change by writing it down; calculating the exact amount of change; and giving the exact change with the fewest bills and coins. Students observed themselves in the video demonstrating the targeted skills, and were able to stop (or rewind) the video if they wished. They used this video self-modelling until they reached the level of being able to resolve the problem on paper. This was implemented twice daily, 4 days a week. The study extended the previous use of video self-modelling, and concluded that an iPad allows learners to engage with academic tasks.

Mobile technology (such as the iPad) is now being widely used to enhance the academic skills of children with SEN. O'Malley et al. (2014) investigated whether the iPad could be used effectively in teaching maths skills to children with SEN. The study included 7 students (2 females, 5 males) with autism, aged between 10 and 13, and it was undertaken in a special classroom setting. The intervention utilised traditional maths instructions with the iPad app 'matching game' over a period of 4 weeks and 17 sessions. The results of the study reveal that children with SEN can increase their maths skills with this iPad intervention, while at the same time demonstrating independent behaviour. Furthermore, the iPad increases students' interest in learning, and can therefore be adopted for a number of different needs.

Bakker et al. (2015) examined the effect of computer games on the mathematics skills of children with SEN, using teacher-delivered intervention with a control group, and an experimental group using mini-games. The study included 97 students, with different special needs, from special needs primary schools in the Netherlands. There was a 10-week game period, with 16 different processed mini games aimed at improving the children's multiplication and division skills. Teachers were requested to spend 20 minutes introducing each game to the whole class, and then allow students play the game for 10 minutes. The teachers then led a discussion into the effectiveness of the game, and finally

the students played the game for a further 10 minutes. The results demonstrate that students with SEN gain greater benefits from interventions in relation to basic skills rather than those aimed at complex mathematics skills. The knowledge from these basic mini-games can be easily transferred to learning, as compared to the control group. In addition, the researchers established the fact that computers enhance the opportunity to adopt or enrich games, and also indicated the significance of the role of facilitators in keeping the children on task.

The iPad can also have positive impacts on improving the communication skills of children with SEN, and software is available which can be used in different ways (i.e. picture based or speech output based interventions) (Kagohara et al., 2013). The results of the study of King et al. (2014) demonstrates that children with autism improve their requesting skills for a preferred item with picture-based software. The participants were children in their early years with autism and who also experienced verbal difficulties in communication. The intervention was based on the iPad application 'Proloqu2Go', which provides children with visual representations connected with basic sentences, such as 'I want', along with similarly structured expressions. The iPad allowed the children to modify the traditional picture exchange communication system to the new technology. The results demonstrated that children improved their requesting skills after the intervention, and also increased their vocal requesting skills. Thus, the iPad allowed children to engage in communication, not only with the device, also to engage with verbal forms by enhancing their verbal skills during the intervention.

A study conducted by Lewis et al. (2005) investigated the ways in which collaborative group work activity on a computer could enable a primary mainstream schoolboy with Asperger's syndrome, who was 7.5 years old, to undertake task-based interactions with his peers. In order to identify the student's general abilities in the classroom and the home, a psychometric test was undertaken in the classroom, alongside an interview with his parents, and a questionnaire filled in by his classroom teacher. Adult facilitated computer group work with two selected peers took place during 6 45-min sessions over

6 weeks, using 'The Clue Finders – years 4 & 5 Adventures'. This is set in Ancient Egypt and involves solving a mystery by collecting clues by means of the software. The result demonstrated that the student did not interact with his peers in a collaborative sense, and the interaction was generally off task. After some encouragement from the teacher, the student began to undertake more appropriate task behaviours, after which non-task-related interactions decreased, while task-related interaction increased. The researchers stated that the role of the facilitator is crucial to ensure productive educational interaction among peers in this kind of computer-based group work, in order to enhance positive outcomes.

To conclude: different types of ICT have been utilised over a number of years, including: video modelling; different software to support the skills of children with SEN and teach skills related to daily life; skills of perspective, reading and literacy (Odom et al., 2014; Knight et al., 2013; Shipley-Benamou et al., 2002; Charlo-Christy and Daneshvar, 2003). The development of mobile devices has the potential to increase the use of video-modelling in the education of children with SEN, due to their ease of operation and their accessibility. Computer technology also gives the opportunity to access stored texts, pictures and voice output (Xin and Leonard, 2014; Chien et al., 2015; Todman et al., 1999). Due to these features of computer technology, it can be effectively employed as a speech generating device, and picture-based system, in order to support the communication skills of children with SEN (Sigafos et al., 2014; Boyd et al., 2015). In addition, digital technology (i.e. the iPad) has the ability to be modified to differentiate individual lessons for those with special needs, and it can enhance the interest of students (O'Malley et al., 2014; Flores et al., 2012). Thus, the use of computer has the ability to enhance the participation and interaction of children with SEN, and can create an environment in which isolation is reduced, and self-confidence and peer acceptance is increased in an inclusive classroom setting (Mavrou et al., 2010).

As illustrated above, children with SEN can benefit from digital technology in a number of aspects, however, it can be claimed that teachers play a key role in orchestrating and

facilitating the use of ICT in classroom activities. Moreover, teachers' perceptions and beliefs in relation to ICT can influence their role as facilitator and orchestrator. It is therefore vital to examine teachers' experiences with ICT, which is undertaken in the following section.

2.2 Teachers, ICT and Education

Teachers, who form a significant part of the education process, are able to integrate ICT into their teaching (Rasmussen and Ludvigsen, 2012). There is currently a tendency to use ICT to support teaching and learning, with some teachers having enthusiasm and confidence in its use (Morris, 2010). In developed countries, the use of ICT has increased over recent years, and a discussion is currently taking place amongst educators concerning the integration of interactive whiteboard and computer technologies in terms of their effectiveness. However, teachers may experience barriers to the integration of ICT, including limited time, resources, and professional development to integrate digital technology and pedagogy (Messenger-Willman and Marino, 2010). Thus, it could prove more effective in meeting the individual needs of students if teachers determine, evaluate and review the effectiveness of existing technology (Messenger-Willman and Marino, 2010). Thus, in order to enable an increase in the effective use of ICT, teachers have a responsibility to improve ICT skills and integrate ICT with the curriculum and pedagogy. Teachers can arrange for training opportunities, and integrate technology with learning, in order to reach sufficient implementation of digital technology (Messenger-Willman and Marino, 2010).

Morris (2010) investigated the use of ICT with 6 educators, as a representative sample to explore this issue in relation to the UK. The participants' experience of ICT in education was between 15 to 25 years, and they were in managerial (or senior managerial) positions. The responses suggest that age impacts on the use of ICT, and younger teachers are more open-minded in terms of its use. Respondents indicated that barriers to its use were time and authority, and one identified the positive benefits of

having similar expectations with other school staff. The study established that teachers require assistance to improve their use of ICT, and that training opportunities are crucial to the improvement of ICT applications and integrations.

Teachers can struggle with a number of barriers while integrating technology into learning and teaching. Kopcha (2012) investigated the perception of 18 elementary school teachers in terms of the integration technology, based on the following 5 themes: (1) professional development; (2) beliefs; (3) time; (4) vision; (5) access. The results of the interviews demonstrated that 12 teachers indicated that time was a considerable challenge in the use of technology in teaching. Time is required for planning the integration of the technology, and some teachers stated that time is also required for the developing and learning of new skills to integrate technology, particularly in relation to the technical and pedagogical aspects. Teachers experience a number of problems with acquiring the skills and knowledge for the integration or use of technology. In general, teachers view technology as a crucial aspect of learning and, when supported by experts, their vision, access and skills are improved. As a result of professional development in integrating and using ICT in education, teachers' beliefs and perception concerning the use of ICT were transformed.

Although developing countries, such as Turkey, strive to improve the technological foundation of schools, teachers still struggle to sufficiently integrate ICT into education. Karaca et al. (2013) conducted interviews with 20 elementary teachers from Ankara in Turkey, in order to determine the critical factors in their use of technology. The result demonstrates that competency and professional development in the use of ICT can affect teachers' beliefs and attitudes, while it is crucial to successfully integrate ICT in learning and teaching. In addition, teachers who hold positive attitudes tend to use ICT more efficiently, and teachers who integrate technology into their daily life use ICT more effectively in education. The teachers indicated that the general factors in integration were lack of time, teaching experience, and the attitude of the school, along with administrative support. It was identified that the integration of ICT could be improved by

schools encouraging the use of technology, and providing support to improve the relevant skills and knowledge, along with positive attitudes and perceptions of teachers during the teaching process.

Despite the integration of ICT in education supporting the teaching process, teachers struggle in its use, and require support to reveal positive results. Wood et al. (2008) analysed teachers' perceptions of ICT. Teachers stated that technology gave the opportunity to adopt specific technological tools for individual students, based on their needs and context. Teachers identified digital technology as an attractive tool in terms of visual and audio presentations. It was also seen as interesting, and helped to give an appearance of professionalism. Teachers related that they felt comfortable with their experience of technology and digital technology, along with their training opportunities and technical support. They required training in order to gain increased familiarity with the technology and software, in order to be able to use these to fulfil the specific needs of children. Teachers expressed feeling uncomfortable using computers in separate rooms, and required integration of the classroom and teaching process. Financial issues were identified as barriers to the use of ICT, leading to the possibility of schools increasing its use by supporting teachers with technological tools. Teachers used technology for free time activities (i.e. for games and watching videos in the classroom), at times including peer tutoring to support children in need of assistance. As a result, teachers claimed that computers create an opportunity to individualise tasks, and ICT is appropriate for use in the education of early years students.

Teachers require skills to integrate ICT in education, along with positive attitudes and beliefs towards ICT, in order to enhance its uses and encourage its use by their students. Ertmer et al. (2012) investigated teachers' perceptions of ICT for teaching and learning. The results demonstrated that teachers believed that the obstacles to use ICT were external ones, i.e. a lack of technical support and training. In addition, one indicated that the adaption of ICT increases if school managers are supportive and encourage teachers to use ICT. A number of teachers indicated that their lack of use of ICT resulted from a

lack of time for implementation and training, along with a lack of skills, knowledge, beliefs and attitudes concerning the difficulties in meeting the standards needed for using ICT. They stated that skills of integration were significant for the use of ICT, with some teachers viewing their integration skills as being the most important. One teacher expressed the view that ICT increased collaboration between students, along with integration with the world, by enabling them to understand different cultures. Teachers used ICT to enrich their curriculum, assist students in learning content, and reinforce learning skills (i.e. maths). One teacher stated that students' participation and motivation was increased by the use of ICT.

The role of teachers in the use of ICT has the potential to increase the effective implementation and integration of ICT in education. Arnold (2015) explored the creative use of ICT among teachers. The study included teachers from a variety of schools in London, with their views established by means of a questionnaire. On average, 84% of teachers considered their use of interactive whiteboard, word processor or over-head projector to be average or above. This indicates that the teachers possessed the skills to integrate these technologies into their pedagogy effectively. Additionally, 4% of teachers felt their programming knowledge was average or above; 8% were able to troubleshoot technical difficulties; 20% understood networking; 4% understood virtual learning environments; 16% were familiar with computer hardware and peripherals; 28% were confident in the use of email, including mailing lists and mail merge. Therefore, if teachers are confident in the areas of ICT requiring some level of synthesis, they have the ability to integrate ICT creatively into education (Schibeci et al., 2008).

2.3 Teachers, ICT and Special education

As stated in the previous sections, teachers are key elements in the use of ICT within special needs education. Many governments have accepted a positive view that technology can affect student learning, and is the reason they allocate funding to create programmes using technology in education (Hew and Brush, 2007). Since its early forms

(i.e. cameras and computers), the potential of technology has been employed by educators to improve their teaching, and teachers have aimed to integrate digital technology into teaching and learning (Hew and Brush, 2007). Moreover, teachers can enhance the opportunity to diversify, specialise and differentiate lessons, tasks and content by integrating ICT into both inclusive, and special, education (Kuegel, 2014; Dipace, 2013). This has the potential to support diversity in schools and promote the different needs of SEN children. It is thus significant to create an interaction between teachers, students, content and ICT, in order to increase the effectiveness of teachers' use of ICT (Perera et al., 2012). The following paragraphs contain teachers' perceptions, attitudes and knowledge concerning the use of ICT for special needs.

Corn et al. (2012) investigated 1:1 computing, in order to collect data concerning the importance of the initiative to improve student learning. Data was collected from 60 learning groups from 18 schools. Teachers stated that a laptop was able to provide many advantages to overcome the difficulties in education of students with SEN, who were able to use a laptop for communication. Teachers stated that the laptop gave students the opportunity to easily work and organise their files, along with the opportunity to specialise tasks and development based on their steps. Technological resources gave the ability to increase students' self-confidence and self-esteem, as they were able to revisit their tasks and reach their peers. Some teachers reported that students with visual impairments benefited from the audio scripts of novels, while the students indicated that they could easily find them on the Internet. Teachers found digital technology helpful for the assessment of students with SEN, due to having flexibility to access different electronic and online sources. However, the entertainment aspect of laptops has might hinder students in their educational tasks, and distract them from the learning process. Besides, teachers found technology helpful for the education of students with special needs.

Brodin and Lindstrand (2003) investigated the needs of special training and support in terms of the use of ICT for special education teachers. Questionnaires were answered by

628 special education teachers, and interviews were conducted with 20 teachers and 10 head-teachers. The results demonstrated that teachers had an expectation of receiving training on the use of ICT to support students with SEN. Over 50% of teachers had an expectation of extending their knowledge of ICT and obtaining new software. Some teachers reported that they omitted to use ICT due to lack of time and equipment, and the need for technical support. Although the attitudes of teachers have now changed towards ICT, they still complain about similar difficulties. However, a significant proportion of teachers consider ICT beneficial for students with SEN, due to the fact that ICT is able to support different needs in a number of ways. Generally, head-teachers have a lack of interest in ICT, as well as lacking the relevant skills and knowledge. Thus, the significant role of the head-teacher had the potential to negatively influence the use of ICT in special education.

Johnson (2013) investigated the implementation and perceptions of 3 special education teachers and 9 teacher assistants in Australia, in relation to the use of tablets with elementary school pupils with special needs. The study followed the use of iPads for approximately 8 months, with the results demonstrating that teachers generally used made use of them to increase literacy and numeracy. Participants indicated that children tended to make use of the iPads, and viewed their use as a reward. It was also indicated that children with autism and ADHD interacted very well with tablets, with their motivation being increased. Teachers claimed that the use of the iPad was enjoyable, engaging, interactive, customisable, transportable and also comprehensive in terms of the activities available. It had the ability to increase the following: concentration; attention; learning and achievement; communication skills; and fine motor development. Teachers and teaching assistants subsequently indicated positive opinions and perceptions based on their experiences.

Although teachers believe that ICT is an effective and supportive method for the education of students with SEN, they still experience a number of barriers to its inclusion. Flanagan et al. (2013) investigated teachers' beliefs and perceptions of ICT

while teaching literacy. The study included an open-ended questionnaire with 58 (46 female, 12 male) secondary school special education teachers, 33 of whom had a master's degree. The result demonstrated that teachers who were younger and had fewer years experience, made less use of ICT. Teachers with a master's degree had a tendency to use ICT, and teachers generally used ICT for reading and writing. The participants stated that, from their experience, ICT was effective, and if students understood the benefits of its implementation its benefits were further increased. In addition, teachers stated that training relating to the integration of ICT enabled them to teach more effectively, and the majority undertook such training. However, a number had difficulties in implementing ICT in the classroom. One of the reasons for not using ICT related to its expense. Teachers responded in a number of different ways when asked if they had confidence in using ICT in education. They generally stated they had the confidence to use ICT in relation to their experience, knowledge, training and skills. Therefore, it can be concluded that the use of ICT is influenced by perception, beliefs, experiences, skills and knowledge.

The perceptions and beliefs of teachers in relation to ICT are significant for enhancing positive outcomes in inclusive environments. Beacham and McIntosh (2014) investigated the attitudes of student teachers towards the use of ICT in education. Surveys were conducted with 239 student teachers attending a course at a university in Scotland. The result demonstrated that student teachers had a positive attitude to the use of ICT in inclusive schools, but were less positive when it came to inclusive practice. They indicated positive attitudes towards the use of ICT as a reward for students, stating no difference between boys and girls. Furthermore, teachers who were confident in the use of ICT had positive attitudes towards its use in inclusive education. The findings suggest that the participants had no difference in attitudes and beliefs in relation to their age, gender, training, and experience of ICT, and this also did not differ in relation to special needs. It appears that teachers accepted ICT as an aspect of education, and thus some technological activities became a significant part of their teaching (Ingleby, 2012).

Overall, ICT has been used in education in a different number of different ways and over a long period of time to promote the education of children with special needs. Different implementation of digital technology has supported children's communication, maths, reading, writing, literacy and social skills. In order to teach these skills, video-modelling and different iPad applications (e.g. 'matching game' and 'Proloquo2Go') have been employed, along with computer programmes and software (e.g. 'The Clue Finders – years 4 & 5 Adventures') (Pennington, 2010; Reed et al., 2011; Alzrayer et al., 2014). The teacher forms a significant element in the effective integration of ICT in special education. The beliefs, attitudes and perception of teachers have been presented above, in order to analyse the reasons behind its use, or lack of use. Generally, although teachers have experienced issues during the implementation of ICT, they retain the belief that it is crucial for education. The opinions, perceptions and attitudes of teachers towards the use of ICT in special education has been presented, along with the fact that teachers hold similar attitudes to the use of ICT in both general and special education. They believe that ICT can effectively support children with special needs. The general position of teachers is identified by a number of empirical studies, which have concluded that barriers for ICT are seen as lack of time, skills and training opportunities, along with integration and adaptation skills and financial issues (Player-Koro, 2012).

This study takes Turkey as an example with which to identify the attitudes and knowledge of teachers in relation to the use of ICT in special education. This context will be clarified by the following outline of the general situation of ICT and special education within Turkey.

2.4 The background to ICT in Turkey

The Turkish education system is centralised, with all educational programmes run by the Ministry of National Education (MONE). Computers were introduced into a very limited number of schools in 1984. With the support of the World Bank (in two phases between

1998 and 2006) MONE has subsequently initiated a project to ensure a significant increase in ICT (Akbaba-Altun, 2006; Demiraslan and Usleel, 2008).

During the first phase (i.e. between 1998 and 2003), MONE equipped 3188 IT classrooms with computers in 2802 elementary schools, and 25000 teachers were trained in basic computer skills. During the second phase, MONE equipped 3000 additional classrooms, with approximately 4000 of these being in elementary schools, while teachers were supported in the implementation of computers for educational purposes (Akbaba-Altun, 2006). However, in both elementary and secondary schools, each computer was shared by approximately 30 teachers, which resulted in a very limited use. After these 2 phases of improvement, IT classrooms were created, which have only been used to teach students computer skills (Özdemir and Kılıç, 2007). Thus the computers given to schools have not been integrated into classrooms to be used in teaching and learning.

On the other hand, MONE has aimed to improve the ICT foundation of the education systems in Turkey. This significant development in the technological foundation is a project called FATİH, which aims to supply an interactive whiteboard, multipurpose printers and projector for each class, along with a tablet computer for each student (Uluyol, 2013). This project began in 2011, with 52 pilot schools, but MONE is still focusing on improving its implementation (Aksal and Gazi, 2015).

Based on the above information concerning the position of Turkish elementary school teachers in relation to ICT, it is possible to identify the general situation of ICT in Turkey. Tezci (2011) has identified the impact of school culture on the perception of the use of ICT by teachers. The study was conducted with two groups, one being 1540 elementary school teachers. It revealed that the use of ICT is affected by the following: access to the Internet and a personal computer; having a positive attitude; school culture. However, gender has no impact on attitudes to ICT. School culture has an impact on teachers' use of ICT, and in Turkey, younger teachers are more likely to use ICT.

Therefore, it can be claimed that schools in Turkey still have a long way to go in terms of using ICT. Government can improve conditions in schools, and integrate ICT into teacher training in order to improve the integration of ICT into special education (Girgin et al., 2011).

2.5 Background of Special Education in Turkey

Special education in Turkey, is under the control of MONE, and covers children aged 0-18 years (Eres, 2010). The Guidance and Research Centre (RAM) is under the administration of MONE, with its role being to identify and evaluate children's difficulties, and maintain special and inclusive education (Melekoglu et al., 2009). Special schools are required to focus on the different needs of children, however, during the previous decade, the government has attempted to increase inclusive education, providing funding to create a supportive policy for inclusive education. Thus, children with special needs join both inclusive and special schools, and take additional sessions from special rehabilitation centres, with some students being educated exclusively in a special rehabilitation centre. In such centres, students are given one-to-one lessons and join some classroom activities. Furthermore, MONE has increased the number of special and inclusive schools, as well as special rehabilitation schools (Melekoglu et al., 2009; Eres, 2010).

3 CHAPTER: RESEARCH DESIGN

A paper analysing the research characteristics of educational technology in Turkey has influenced the research design of the current study. Kucuk et al. (2013) investigated research trends in the field of educational technology taking place in Turkey between 1990 and 2011. The findings of this paper indicate that over 60% of the research adopted the quantitative method, with the most common research instrument being the questionnaire. Considering the centralised nature of the education system in Turkey, and supported by the findings of Kucuk et al. (2013), it can be inferred that insufficient attention has previously been given to the opinions of teachers. Thus, the current study focuses on giving an opportunity for teachers to share their thoughts, perceptions and understanding in their own words, through adopting qualitative research methodology, and with the research instrument being semi-structured interviews.

3.1 Methodology

The focus of this current research is to investigate teachers' attitudes, knowledge, beliefs and perceptions of using ICT for the education of children with special needs. The aim is to analyse, explore and understand the teachers' point of view in depth, as well as establishing the paradigm concerning the rich and deep perspective of participants. This can be achieved by the use of the qualitative method (Kumar, 1999), which aims to investigate specific cases in specific paradigms, and, through means of interpretation, to understand cases deeply (Denzin and Lincoln, 2003). It allows the celebration of the multi-dimensionality of subject matter by an analysis that is both deep and rich, in context and in its complexity (Barnes and Sheldon, 2007; Mason, 2002).

The qualitative method includes interpreting the words of participants or the researcher's observations, in order to analyse and deeply understand the sample (Grbich, 2013). The main emphasis is on the interpretation of the following: experience; thoughts; perceptions; opinions; feelings; beliefs; and participants' knowledge of a particular

subject matter. In this method, the words constructed by participants are significant for the interpretation of the data. The participants of the current study were asked to identify and explain their attitudes, beliefs, knowledge and perception of the use of ICT in education, particularly in relation to special needs. Therefore, the qualitative method has been adopted for this study.

3.2 Research Method: Semi-Structured Interview

Since the aim this study is to investigate teachers' attitudes, perceptions, beliefs and knowledge in relation to the use of ICT in special education, a research method is required that allows researchers to obtain an insight from participants from their own words. This interview method can be characterised as "conversation with a purpose" (Marshall and Rossman, 1999, p. 108), and as a "dynamic form of dialogue" (James and Busher, 2009, p. 26), giving the opportunity to collect large amounts of data in a short amount of time. During the interviews, the researcher aims to reveal the opinions, beliefs and perceptions of participants in relation to a specific subject by posing questions, either face-to-face, or via the Internet (Kumar, 2011). Researchers need to demonstrate to participants that their views and answers are valued (Marshall and Rossman, 1999), and interviews can permit researchers to collect in-depth and rich data, and go to the heart of the subject matter.

The semi-structured interview can enhance opportunities to collect data purposely by directing and modifying the questions and answers (Newby, 2010). It allows the flexibility of keeping participants on-task and obtaining answers that will enrich the data. Additionally, semi-structured interviews can distinguish between interviews and questionnaires, while a highly structured interview may prove difficult to differentiate from an open-ended questionnaire (Denzin and Lincoln, 2008). Therefore, the semi-structured interview method has been employed to collect deep data, and the participants were generally asked to get detailed responses. This enables specific

elements of investigation, and the answers, to determine the impact, aspects, skills, knowledge, and variables affecting the use of ICT in teaching and learning (Flick, 2002).

In this study, the 'yes-no' type of question was avoided to prevent the collection of poor data, with open-ended questions being asked instead (Cohen et al., 2000). Prior to conducting the research, the relevant questions were determined, and their relationship to the literature was identified (see Appendix 3). Semi-structured interviews embrace open-ended questions to investigate teachers' attitudes, knowledge and perception. A computer-based approach was selected to undertake the semi-structured interviews, due to the distance between the UK and the focus country (i.e. Turkey).

3.3 Sampling Strategy

Due to the fact that qualitative methodology deals with a relatively limited number of participants, their selection should lead researchers to a greater understanding of the context. Finding participants during the summer period was not easy, but having connections with many teachers allowed the researcher to find appropriate participants for this research. When it came to participants from mainstream schools, the emphasis was placed on teachers with experience of special needs students, while teachers in rehabilitation centres only work with students with SEN.

A number of the researcher's colleagues visited schools and invited teachers to become involved in this study, but there was a lack of interest, due to it being undertaken out of term-time. However, 3 teachers of mainstream schools agreed to participate. In addition, the researcher contacted schools, rehabilitation centres and teachers, with a further 6 teachers (2 from mainstream and 4 from rehabilitation centres) agreeing to participate, of which: 3 are urban primary school teachers; 2 city school teachers; 4 city teachers of the rehabilitation centre school; 1 is a primary school teacher; and 3 are rehabilitation centre teachers who have undertaken an in-service special needs course. The participants' teaching experiences varies from 2 to 13 years. Although 9 teachers were interviewed, only 8 (2 female and 6 males) are included in this study.

3.4 Ethical Considerations

Serious consideration was given to the ethical aspects of this study, in order to preserve the participants' rights. This study aims to reach the main criteria of BERA (2011), and reveal all ethical requirements. Firstly, the permission of the University of Nottingham Ethics Department was sought by submitting the interview questions, and the general content of this study, to the ethics committee to gain the ethical approval to start collecting data. After the necessary permission was granted, the participants were identified, and were informed about the general context and content of the study. The information paper (see Appendix 1) describing the purpose of this study was sent to each participant before starting the interviews, in order to enhance the participants' familiarity with the study. The participants were reassured of the confidentiality of this research, which is a significant aspect of ethical consideration for researchers (Oliver, 2010). Their right to withdraw was clearly explained (Oliver, 2010), and was also clarified in the participant consent form (see Appendix 2). The consent form signed by the participants also confirmed their right to withdraw without consequences, clarified the voluntary nature of their participation, and they were made aware of their rights.

The confidentiality of participants was ensured, in order to protect their rights and retain their participation (Brinkman, 2007). Participants' names have not been used, ensuring anonymity. Furthermore, the participants' place of work is not identifiable in any data. This ensures participants feel comfortable answering the questions, and reduces the possibility of misleading responses (Oliver, 2010). In addition, participants who were synchronously, or asynchronously, interviewed were given the opportunity to review their answers in full, and to change points with which they did not feel comfortable. Moreover, according to the Data Protection Act, it is the responsibility of researchers to protect data and file it under conditions of privacy and anonymity (BERA, 2011). Therefore, participants were reassured that their answers were maintained in a confidential manner and on a PC which was password protected. Finally, it was explained to the participants they would be welcome to request access to the findings of the study.

3.5 Data Collection Procedure

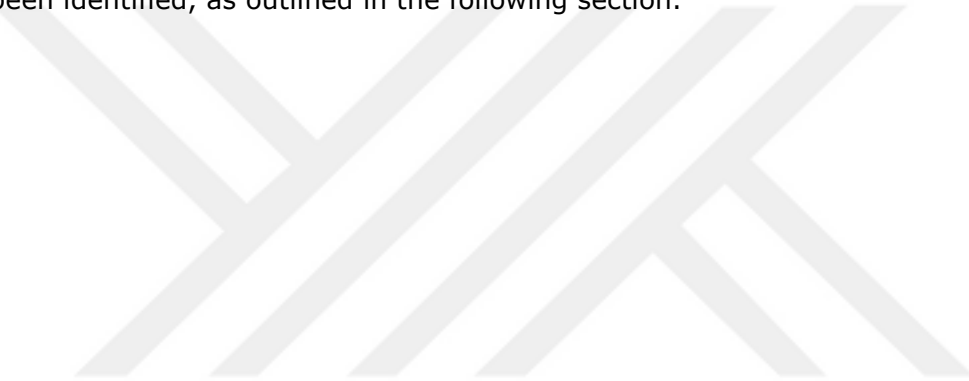
All participants were connected via Smartphone application 'WhatsApp', and were asked whether they were able to participate in this study. A suitable time was scheduled for those who agreed to be interviewed synchronously. In addition, emails were sent to the other participants. Before starting the interviews, the interview schedule was introduced to the participants and identified as the research instrument, even if by electronic media (Kumar, 2011). After seeing the schedule, the teachers stated their agreement to being interviewed via email. 3 participants were interviewed synchronously via Facebook 'chat', and 5 were interviewed asynchronously via an email computer-assisted interview. Moreover, the participants interviewed via email were re/sent further questions to fulfil the nature of semi-structured interviews in obtaining deeper insights from the teachers. The interviews were conducted between 20th of July and 5th of August 2015.

3.6 Data Analysis

The process of data analysis is vital, in that it permits the transformation of data into meaning in the context of the research (Grbich, 2013; Rapley, 2001). Due to the nature of the research topic, thematic analysis is suitable to analyse the data. Thematic analysis is a method of qualitative analysis, and, as such, allows an exploration of the opinions, beliefs, perceptions, experience and attitudes of the participants. Furthermore, Braun and Clarke (2006 p. 79) state that: "Thematic analysis is a method for identifying, analysing and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail."

Thematic analysis is a useful and flexible method, allowing an opportunity for highlighting similarities and differences. It provides details on themes and experiences, meanings, reports about participants. This method includes 6 phases (Braun and Clarke, 2006), with the first step being to obtain familiarity with the data by reading it repeatedly. Researchers can deeply understand the data and underlying and identifying patterns and ideas increase this opportunity during reading. After listing the points of

interest, researchers identify the relevant information for the coding process by highlighting similar points. Researchers can use tables to unify the information under the codes. In addition, researchers can identify sub-themes, and thus the connection between the codes, themes and sub-themes should be clarified. During the process, researchers should be able to rearrange and recreate themes based on their needs. During the following phases, the themes are refined, and defined, in terms of diversity and complexity in context, and they are named. At the end of thematic analysis process, a detail analysis of themes should be provided. During the thematic analysis of the interviews, the above phases have been followed, and some themes and subthemes have been identified, as outlined in the following section.



4 CHAPTER: FINDINGS AND DISCUSSION

This chapter focuses on the results of the thematic analysis of the interviews. Prior to the analysis, the interviews were translated from Turkish to English with the aid of a friend of the researcher, who is studying for a PhD at the University of Nottingham. In order to be able to use suitable phrases, and adopt the phrases in suitable context for English, the researcher and the PhD student discussed responses in their context and searched educational websites to identify the most appropriate translations for each educational phrase. In addition, a number of codes have been used to name the participants. The 5 participants from inclusive schools are known as I1, I2, I3, I4 and I5, and the 3 participants from rehabilitation centre are R1, R2 and R3.

A total of 5 themes were identified, as analysed and discussed in this section (see Table 1). The first theme concerns teachers' use of technology in their daily life, to demonstrate their connectivity with ICT. The second theme focuses on the infrastructure of ICT and the policies in place to identify the impact of the following: schools; administrators; MONE; technology foundation; support; and training opportunities for using ICT. The third theme concerns teachers' pedagogical perceptions towards ICT in relation to special needs education, in order to identify the role of teachers, and the appropriate implementation of ICT for students. The fourth theme concerns the personal factors identifying teachers' attitudes towards the use of ICT. The final theme identifies teachers' expectations for the future, in order to analyse the future of ICT in Turkish education.

Table 1

	Themes	Description
Theme-1	Teacher's use of technology in daily life	Use of smartphone, and its applications, general use of ICT

Theme-2	ICT Infrastructure and Policy	Policy of ICT and the role of MONE and school, technology in classroom, training and support
	Subtheme-1 The role of MONE and Schools	Attitudes of schools principals, general ICT policy, and their effects
	Subtheme-2 Technological Foundation	Available ICT devices in schools,
	Subtheme-3 Support	Training support, and support for ICT devices
Theme-3	Teachers' Pedagogical Perceptions Towards ICT in relation to Special Education	Pedagogy of ICT, teachers2 pedagogical applications, ICT for pedagogy of special education
	Subtheme-1 ICT Implementation	The use of ICT, applications for needs, supporting skills, general specific presentation of ICT
	Subtheme-2 Student Factors	The effects on students, their attitudes, their role during teaching and learning
Theme-4	Personal Factors and Attitudes	Teachers' role and the effects of professional developments, the role of attitudes
Theme-5	Teachers' Perceptions of Future Developments	Teachers' willingness to use in the future, advice for the future, improving ICT in the future

4.1 Theme 1 – Teacher’s use of technology in daily life

The teachers’ daily use of digital technology is analysed in order to identify the relationship between teachers and ICT, due to the impact this may have on teachers’ attitudes towards, and knowledge of, the use of ICT.

4.1.1 Varieties of Digital Technology

All participants own a number of digital technologies, the most common being the smartphone, which they consider an essential technology for daily life. All participants were contacted through smartphone applications, and thus it can be stated that the participants have adopted the use of mobile technology in their daily lives. A further important aspect concerns the use of digital technology by families, with some participants stating that they share their personal computers with their partners and children.

“In daily life I use technology and I have a laptop. My sons have a tablet computer.” (I1)

“Nowadays, technology has become an indispensable part of life (...) I have a smartphone and a laptop.” (R3)

Variation also exists in the use of digital technology. Social media and online newspapers are leading digital activities with which the majority of participants have engaged, along with some who use online banking and billing systems, which can be considered complex digital activities.

“I check the news on the internet. I often use the Internet to pay the bills. I especially use mobile banking on my smartphone.” (I3)

4.1.2 Personal Digital Devices for Educational Purposes

Personal digital devices for educational purposes are used for school administration and research areas, as well as classroom activities. Teachers also use ICT out of school to prepare the next day's sessions or follow other educational work.

"The online platform of MONE e-school can be used now as an application." (I1)

"I videotape my children's work and improvement to evaluate and compare over time. Another area of use is when I had a six-year-old student, and recorded the student's studies and general information. I then worked for a long time in another school, and after I returned, the records were helpful in identifying the previous work of the student." (I4)

The response of the teachers demonstrates that their daily use of ICT can shape their attitudes towards integrating ICT into learning and teaching. However, despite the perception of a number of teachers that digital technology is an indispensable part of the life, barriers still exist, including the effects of personal development and training for a sufficient use of ICT.

Teachers play a key role in integrating ICT into education for development and new strategies, and therefore teachers' daily use of ICT can play a key role in transferring these skills for use in special needs education. It is evident that the teachers' use of digital technology in their daily life, on a high and complex level, influences their use of ICT in school (Arnold, 2015), and has increased the level of ICT integration in this study. The teachers are highly adapted to technological improvement, and tend to use the latest versions of mobile technology and software.

All participants have an Internet connection, even if only through a smartphone, and use the Internet to find different and supportive educational resources and materials. Karaca et al. (2013) established that ICT experiences and competencies affect the way teachers in Turkey apply and integrate ICT in teaching and learning. Moreover, no differences

were identified in use in terms of gender, with the 2 female participants of this study identifying a similar use of ICT devices for daily use or educational purpose as male participants. Beacham and McIntosh (2014) also identified no differences in attitudes towards ICT in relation to gender.

4.2 Theme 2 – ICT Infrastructure and Policy

4.2.1 The Role of MONE and Schools

ICT policy in Turkish schools is dominated by MONE, and all teachers have clarified that their use of ICT relies on the support and policies of MONE and the provincial educational offices. School boards also play a key role in following ICT policies and maintaining ICT integration in classrooms. Teachers indicate that they have encountered policy confusion in school and ICT integration has been primarily their own responsibility.

“Every year they create many policies about the use of ICT, but unfortunately we did not have any help in terms of classroom ICT.” (I5)

MONE has recently announced the FATIH project. This will equip all classrooms with digital technology, along with an Internet connection for teachers and students.

However, all participants state that school boards have differing attitudes towards allowing teachers to have an Internet connection in their classrooms, with some allowing it only for administrative purposes, so failing to follow MONE ICT policies. One participant indicates that he maintains an Internet connection through his own smartphone for classroom activities.

“Sometimes, suddenly I decide to show something on the Internet. I have a computer, thus I can. This is a crucial opportunity for me, also for the children. Unfortunately, in many schools the Internet is only available in the administrative office.” (I4)

“In my classroom, there is no available Internet connection, so I used my smartphone Internet connection.” (I3)

A number of issues have emerged in the case of special rehabilitation centres, which are more independent than state schools and fully responsible for the implementation of ICT. While some participants acknowledge that their boards provide them with several digital technologies and an Internet connection, others complain of boards citing financial restrictions.

“These schools are not helpful in terms of educational material because of money issues, especially to get more benefit, they avoid spending money.” (R1)

“In my school, the use of ICT is limited, only the computer is available. I get limited support from my school.” (R3)

“My school tries to provide ICT tools as much as they can.” (R2)

The supportive role of education policy and of schools has a positive impact on the application of ICT. Turkey’s policies play a supportive role in the integration of ICT, but there are still some problems in practice (Aksal and Gazi, 2015). The participants point to institutional barriers (i.e. lack of support from school principals) restricting the use of ICT (Ertmer et al., 2012). Despite an Internet connection being required during classroom activities, school administrations often fail to ensure this can be used in the classroom. Karaca et al. (2013) demonstrate that school administrators have no impact on teachers’ attitudes and use of ICT (as can be understood from the current study), however, the lack of support and creating an adaptive environment can limit its use.

Despite policies aimed at improving the infrastructure of ICT in schools, provision remains insufficient. Karaca et al. (2013) state that this may be due to teachers' perceptions and skills, however, the current study demonstrates that the majority of teachers are willing to use ICT in different ways to enrich their presentations. In addition, in the case of special rehabilitation centres, some schools fail to allocate resources for ICT, in contrast to the participant who points out that the school is willing to improve ICT applications.

4.2.2 Technological Foundation

The technological foundation of schools influences the use of ICT in classrooms. Teachers indicate that they had expectations for schools and MONE to improve their schools' foundation. Some classrooms are provided with basic ICT devices, while some have none. Some participants state that they struggle with integrating ICT in their classroom activities, despite their ambition to overcome the lack of digital technology foundation in their schools.

"In my classroom, there is a projection, sound system, a laptop. The interactive whiteboard is not available." (I1)

"The available technology in my classroom has been just a computer." (I2)

"I had to take my students to the IT classroom for ICT implementation, interestingly the IT class teacher was not willing to use ICT for educational purposes." (I5)

"There is a computer in the classroom, and when I need it, I can bring a projector into the classroom." (R2)

Teachers need to be supported to overcome the barriers of a lack of foundation, or an inappropriate environment, to integrate ICT in teaching and learning and increase its use. The teachers state that ICT is not affordable for teachers, and indicate the necessity for support. However, some teachers have attempted to overcome difficulties themselves, using their own computers or tablets, and financing their own ICT tools, or gaining alternative assistance.

"Technological devices are expensive; therefore it is not affordable for teachers." (I4)

"The technology I can apply in my classroom is my own tablet and android smartphone."
(R1)

"In my classroom, there was no computer or projector. I brought them." (I4)

"I brought an old projector, which belonged to a friend." (I5)

It can be inferred that teachers have personally provided ICT, due to the lack of digital technology in their schools, and applying a number of strategies to overcome these issues. However, the problem appears to be beyond their capabilities.

One of the significant obstacles to the integration of ICT concerns the lack of technological devices (Hew and Brush, 2007). The respondents of the current study have outlined the available ICT tools, with some classrooms having a limited ICT foundation, leading to the respondents providing their own tools. As identified in the study of Ertmer et al. (2012), this forms one of the external barriers highly influencing the applications of teachers. Teachers use their own smartphones and Internet connection, lowering the effective use of ICT, due to teachers struggling to provide their own technological devices. Therefore, they also might not be questioned about whether they apply ICT, and in which way because of lack of ICT foundation.

4.2.3 Support

As noted in the previous section, there is a variation in the availability and scope of digital technology in schools. In addition, it is clear that simply equipping schools with ICT devices is insufficient for the achievement of ICT integration, and teachers require additional support.

"Sometimes, my computer is broken and it is difficult to do lessons, if the lessons rely on the computer." (R2)

Some teachers state that they have some basic technological tools, which are insufficient for effective implementation of ICT, along with the lack of support that hinders the integration of ICT. The FATIH Project led to expectations in terms of ICT devices, however teachers point out that additional training was needed to enable them to integrate the current improvements of the FATIH Project.

"I expect some technological devices based on FATIH Project, I think next year." (I5)

"We have some old computers and software that are not suitable for today, but there has not been any effort to upgrade or renew those technologies." (I2)

In addition to support for upgrading old technology, all participants indicate that they have never been given any pedagogical training in relation to ICT, and have only been given technical training during in-service, or pre-service, education, in order to enhance their training opportunities. All teachers note having followed a computer course during the university-based part of their course, but the content was limited to the transfer of skills in teaching and learning. Therefore, the findings demonstrate that one of the obstacles for teachers to integrate ICT in teaching and learning is related to a lack of training, which should be provided by MONE (Schibeci et al., 2008).

"I am a teacher with 13 years' experience, but I have not taken pedagogical training in terms of ICT. They just taught computer skills." (I1)

"In the university, in computer class we learnt how to use a computer and prepare with computer educational materials, such as creating slides. In some educational implementation classes we used slides during acting out teacher activities." (I3).

Some teachers have attended MONE training programmes, but the content was at a basic technical level. Some add that MONE arranged a number of conferences related to the use of ICT during the FATIH project, but these focussed on the theoretical, rather than improving and supporting ICT skills.

"After the FATIH Project, an expert presented some basic information about ICT with a video-conference system." (I2)

The teachers' responses generally demonstrate similar training during the university process. They indicate the need for training to be more focused on the pedagogy of ICT

implementation. Teachers do not accept the education they followed at university to be sufficient training.

Teachers may need training to use ICT, and therefore a lack of training, along with difficulties in identifying suitable technological tools, could present difficulties (Messinger-Willman and Marino, 2010). Training to introduce suitable ICT applications can increase the use of ICT, due to the fact that (as indicated by one of the teachers) sufficient knowledge of the benefits of a specific technological implementation or tools can increase the use of ICT.

"Some teachers do not have information about effective ICT applications, and they do not search for it." (I5)

The answers demonstrate that the integration of ICT is a process that may reveal a level of continuous support and improvement. The teachers point out that they may need assistance in terms of technical support, and its lack could negatively influence ICT applications. Teachers require support in using different technologies and adapting previous skills to new technologies, including technical support (Hew and Brush, 2007). In addition, teachers may need help in the use of applications, or to overcome any problems arising from tools and devices. Technical support could include the upgrading the old technologies to 'state of the art' technologies.

One of the important aspects in relation to the adaption and improvement of skills relates to training. Teachers note a lack of ICT training in the education system, supporting the results of Karaca et al. (2013), thus emphasising the need for increased training to improve the use of ICT. The training opportunities should be integrated into pre-service and in-service education, in order to create opportunities to upgrade skills based on improvements. Flanagan et al. (2013) have also stated that teachers indicated a need for training opportunities.

Although some participants of the study of Morris (2010) did not acquire basic ICT skills, based on the findings, the participants of the current study have acquired such skills. It demonstrates that teachers with basic skills of ICT may be willing to integrate ICT into education. Skills and knowledge play a key role in integration, and (based on the responses) this could be a reason for any avoidance of using ICT (i.e. the lack of knowledge of ICT applications). The findings of both this study, and that of Morris (2010), demonstrate that some teachers may avoid improving their skills, or may change their experiences and seek improvement.

4.3 Theme 3 – Teachers’ pedagogical perception towards ICT for special education

The results demonstrate that teachers are aware of some pedagogical opportunities for ICT to enrich teaching and learning activities in their classrooms, as well as for students with SEN. They state some pedagogical use of ICT, i.e. some teachers applied ICT at the beginning of a lesson to gain attention.

“I use ICT in starting a new subject to get the attention of students.” (I2)

“Children with special needs have a short attention span, thus, I think that by applying ICT we can increase their attention span.” (I4)

Teachers apply ICT to enrich the presentation of lessons, including watching supportive cartoons, documentaries about animal life, nature, space and the world. Teachers utilise different presentations of ICT for different aspects. The responses of teachers demonstrate that a common use of ICT is to present a lesson with slides, educational videos, and providing sound and visuals to enrich lessons.

“Children especially like video about animals, the world and space.” (I1)

“ICT allows making lessons more enjoyable for students, and increases permanent learning and attention span.” (I3).

One teacher states that digital technology makes life easier, i.e. it can make teaching and learning easier (R1). Another points out that ICT allows them to provide visual and sound features, which can help teach abstract concepts (R3).

“For example the children get motivated easily, and do activities with intent. They meet with different materials compared with previous materials, thus, they are connected to the learning.” (R1)

It can be claimed teachers do not put up barriers in terms of helping children with special needs. They believe that, with sufficient effort, they can support children with special needs, and ICT can be utilised for more effective teaching and learning.

“If we give students enough time for learning, every child has the potential to learn. An individualised learning plan might be implemented easily with a tablet or a laptop belonging to the student.” (I5)

Furthermore, teachers point out that technology is everywhere, and therefore educators should integrate the rapid improvement of technology in education and in the classroom. One teacher states that teachers can no longer simply teach with traditional methods, and need to adapt their methods, skills and knowledge to benefit from such improvement (I5).

The results of the interviews demonstrate that teachers have positive attitudes towards the use of ICT in classrooms to support different needs. They tend to use it for general presentation rather than individual use, possibly due to the lack of personal ICT devices. Teachers in both the inclusive classrooms and the rehabilitation centre point out that the use of mobile devices could be more appropriate to support individual needs.

“I can use any ICT tool, which, in my opinion, is effective, due to the significant point being to assist my students.” (I4)

One teacher states that the use of mobile devices in the classroom could result in a number of issues, and that planning is required to use ICT in an effective manner. The teacher states that one of the difficulties faced in the general classroom concerned classroom management.

"Tablets now are used commonly, but I do not approve of the use of tablets in the general classroom. In my opinion, they are not appropriate for some ages and levels. However, we do one-to-one implementation for students with special needs, thus, in their case, a tablet can be used, and control might not be difficult." (I1)

The teachers point out that some advantages of ICT might include an opportunity to save time during implementation, and the fact that it allows presentation and working in conditions which cannot be implemented in the classroom, i.e. video modelling.

"For example, we can teach hand washing skills and other, similar, skills (which are difficult to demonstrate in the classroom) by video modelling." (R1)

On the other hand, they state that sometimes they need to search for information during class, and ICT allows this without interrupting the learning and teaching process.

"It allows teachers to search for information while teaching." (R2)

Technological implementation can be presented to the student with special needs in the classroom while teachers teach other students, therefore allowing teachers to save time, particularly as there are no teaching assistants in inclusive classrooms in Turkey.

"When other students do their work, I use ICT to support my student with special needs, and it saves time." (I5)

Teachers apply ICT in various ways to support teaching and learning. One supportive implementation of ICT is to gain attention to increase outcomes during educational activities. One participant points out that ICT can help teachers to increase the short

attention span of some children with special needs. Participants of Johnson's (2013) study were also of the opinion that ICT increased children's length of focus, and they used similar words to the participants of this study, i.e. 'attention' and 'concentration'.

The respondents state that ICT allows them to make their lessons more amusing. The participants in the study of Wood et al. (2008), generally referred to the use of ICT making learning and teaching enjoyable. On the other hand, the respondents of this current study state that ICT devices allow them to enrich lessons with visual and audio support. The teachers state that they use ICT to provide sufficient support with relevant content and suitable presentation. One teacher indicates that children should learn new skills, be able to identify ICT tools, and adapt them to their daily life. Therefore, using ICT could involve learning new skills in relation to technological improvement, and might enable children to integrate ICT into their lives.

The findings demonstrate that teachers possess positive attitudes to the use of ICT in teaching and learning, which may be due to the adaptation and integration skills of teachers who integrate ICT into their daily lives. Moreover, as clarified in their responses, teachers are aware of the potential benefit of ICT. They note positive experiences, and use ICT to enrich their lessons, thus increasing the use of ICT. Kopcha (2012) similarly noted finding those teachers with support and ICT skills expressing positive beliefs and attitudes towards the use of ICT. Teachers state that they would use ICT if they believed its implementation to be effective (Hew and Brush, 2007). This demonstrates the effective influence of positive beliefs.

However, one teacher reports not being supported in the use tablets in the classroom, and she (I1) believes that control might prove an issue, leading to general applications (i.e. the interactive whiteboard) being more appropriate for inclusive classrooms. This may be due to a lack of practice and training in the use of tablets (Ertmer et al., 2012). Besides which, a number of teachers state that a tablet computer might allow them to save time while other students are working, so enabling them to work with a special

needs student using a tablet. Furthermore, the ease of video modelling allows teachers to present subjects which cannot be brought to the classroom, with a number of studies having identified the advantages of video-modelling (Burton et al., 2013; Delano, 2007; Shipley-Benamou et al., 2002).

4.3.1 ICT implementation

The responses demonstrate that teachers employ ICT in a number of ways to support their students and enrich teaching and learning. Teachers state that ICT has been used to support social, communication skills, and teach basic literacy and numeracy skills, i.e. identifying numbers and letters.

“Maths skills need to be embodied; therefore, I have used ICT many times in teaching maths skills.” (I2)

“I used it for teaching voice and sounds. Sometimes we had difficulties in communication; I used animal sounds to connect with students.” (R1)

“We had difficulties in maintaining reading activities with one of our children with autism, but when we loaded the pictures and texts into the computer, the student kept reading for a long time.” (I4)

This demonstrates that ICT can be attractive for students, due to the game-like nature of technology, as noted previously in the literature review. ICT can be used in different ways to support students with special needs.

“We watch silent films of Charlie Chaplin with students with hearing and verbal difficulties.” (R2)

Teachers acknowledge their use of educational websites to find different activities for practice, learning and evaluating. By using ICT in education they are able to utilise the shared experience of other teachers through forums or educational websites.

"I used some educational websites to find interesting activities for my students, but unfortunately the resources in these websites are limited in terms of special education."
(I5)

One teacher notes videotaping the success of his students, and when they forgot these skills, he showed them the videos, which can be seen as an example of video-modelling implementation (I4). Besides which, some teachers use ICT in basic ways, such as presenting information or knowledge.

"I generally use a computer and projector. I did not implement any special individual ICT activities." (R3)

The findings illustrate that teachers apply ICT in a number of ways to support the different needs of the students. Teachers support their students through ICT, social communication, and literacy and numeracy skills (Bakker et al., 2015; Pennington, 2010). In the study by Johnson (2013), the teachers' responses demonstrated that they applied ICT to support similar skills. The participants of the current study utilise ICT to support maths skills with computer programmes and software. Generally, teachers apply ICT for communication and social skills through watching videos. As an example of the use of video-modelling, one teacher noted videotaping his student, after which they watched the video together to remind the student of his skills (Lewis et al., 2005; Burton et al., 2013). Teachers indicate that the game-like nature of ICT devices attracts students to continue with the tasks. King et al. (2014) also noted the game-like nature of this technology.

4.3.2 Student factors

Students have a significant impact on the effective use of ICT, and teachers need to take into account their skills and needs. Based on their experience, the teachers have clarified the potential aspects revealed by students during their use of ICT, including that its

frequent use might isolate students from social interaction, but also that it has the potential to reduce communication issues (R3).

The researcher's experience as a special education teacher has led to an observation that pupils may wish to use computers constantly, with one student refusing to turn off the computer. This had also been experienced by one teacher in the current study:

"I did not face big problems during computer activities, but my student always refused to turn the computer off. Also the student struggled in carrying on the activities." (I2)

In addition, as stated by participant I3, there may be some positive feedback from students, due to the fact that visual and audio presentations make students happy and excited. The teacher does also state: "However, when I did not bring my computer to the schools, I had problems in getting the student's attention".

However, the teachers state that students benefit from specific software, programmes or ICT integrations designed to address their specific needs, allowing teachers to transfer their focus from ICT to the students. The significant aspects relate to identifying needs and the adoption of ICT. Overuse of ICT can create problems, but its controlled use can have a positive effect on students.

"During implementation, the feeling of 'I can do that' increases the student's self-esteem." (I4)

Teachers indicate that it could be problematic for some students to achieve the appropriate motor skills. However, provided that teachers evaluate the student's abilities, they do not consider that ICT creates additional difficulties. They state that the implementation of ICT has (in comparison with traditional methods) the potential to promote learning, including the use of a greater number of senses, potentially increasing permanent learning.

“Despite the fact that my typical students learnt in a short time to use the keyboard and mouse, the special needs students had problems in using them. The students had difficulties in following fast-moving visuals, thus, the students needed to pause the videos during watching.” (I3)

“Sometimes students have difficulties in holding tablets.” (R1)

Teachers clarify some of the students’ difficulties and problems, with a number of teachers indicating that the use of ICT might isolate the students from society, with a similar point being stated in the literature (King et al., 2014). In addition, in a number of cases, students refused to leave the ICT devices, leading to a potential hindering of the learning and teaching process. Moreover, one teacher points out that the application of ICT might lead students to become excited and happy, as clarified in the study of Wood et al. (2008). It might be difficult for some students to achieve the required motor skills to use ICT tools, thus potentially limiting their use. However, the effectiveness of ICT applications for students with special needs could be achieved by centralising their needs and creating ICT tools based on their skills and needs.

4.4 Theme 4 – Personal Factors and Attitudes

Some teachers can experience difficulties in adopting and following pedagogical and technological developments. Therefore, some teachers might prefer traditional methods, including presenting the lesson using the narrative method.

“For older teachers, the use of technology is limited.” (R3)

One barrier may relate to keeping up with technological improvement. Some teachers claim that rapid improvement can create difficulties for the integration of ICT, and rapid improvements require new skills to adopt, or transfer, changes in daily life and in school.

“Nowadays, technology has changed a lot, and, following technological changes, might be difficult for some teachers.” (I2)

“They do not understand the technology, so they do not have the skills to follow improvements.” (R1)

Integrating ICT in teaching and learning could be undertaken through personal development and integrating skills. Teachers unwilling to adopt their skills and knowledge could avoid using ICT in education.

“Some teachers might struggle to use ICT because of a lack of skills in relation to using specific ICT tools.” (R2)

In addition, some teachers may believe ICT is not beneficial for students, which could reduce the possibility of integrating ICT into the classroom.

“Some teachers believe technology is not beneficial for education.” (I5)

One of the key points of ICT implementation concerns the role of the teacher. Some teachers can experience difficulties in applying ICT for educational purposes, and upgrading their skills. The barriers can relate to age and rapid improvements in integrating ICT skills (Hew and Brush, 2007). Some teachers may prefer to stay in their comfort zone rather than struggle with the rapid advances of ICT. Arnold (2015) demonstrated that some teachers had limited understanding of networking and use of ICT. On the other hand, some teachers might not be aware, or informed, of the benefits of ICT, and its advantages for students with special needs. Thus, a lack of knowledge about the benefits of ICT might lead to teachers having a negative attitude towards ICT (Ertmer et al., 2012).

4.5 Theme 5 – Teachers’ Perceptions of the Future

The teachers’ answers demonstrate that the participants intend to use ICT in the future, and they indicate their desire to be able to use it as much as possible in their current situation. The expectations of teachers concerning ICT, demonstrates that it has a future in the education system of Turkey. Teachers state that, for special needs students, they

would like to have a computer, laptop, projector, interactive whiteboard, and a personal tablet.

“I would like to use an interactive whiteboard, because it has many options in terms of its use. It gives the opportunity of going over previous lessons, which can be recorded, and we can watch these lessons again and again.” (R2)

“I would like to have computer software that allows the creation of simulations of shopping skills and to enable the improvement of ideas and social skills.” (R3)

Additionally, teachers have expectations that the FATIH project will improve the foundation of ICT in schools, along with school policies on ICT. However, teachers state that they do not expect significant improvement in terms of ICT within the next 5 years, as they believe MONE does not pay sufficient attention to the technological improvement of schools.

“In the next year, due to the FATIH Project, I expect to have an interactive whiteboard and those kind of things.” (I5)

Teachers’ expectations are also appropriate for the needs of their students. Their perceptions of the future focus on improving future learning implementations and enhancing opportunities for children with special needs. It can be claimed that high levels of teaching skills are intended for teachers, including ICT integrated teaching and learning processes.

“I would like to have tablet computers. Because I have students with orthopedical difficulties, the portability of a tablet computer might help them.” (I3)

The teachers’ answers can lead to the conclusion that they have already adapted to the use of ICT in daily life, and in education. The obstacles and barriers arise from a lack of support, pedagogical training and integration policy.

Teachers were asked about their future perceptions of ICT in order to explore the future of ICT and the willingness of teachers. Their attitudes and beliefs demonstrate that teachers may increase their use of ICT in the future. They particularly point to the need for interactive whiteboards in their classrooms, while teachers in rehabilitation centres (which use one-to-one lessons) point out the need tablets for students. Some teachers claim they are looking for smartphone applications and computer software to support social, communication and literacy skills. For future ICT integration, there is a need for additional training opportunities to increase pedagogical skills. One teacher's expectation related to the portability of tablets for students with orthopedical difficulties (Johnson, 2013). Thus, the study of Karaca et al. (2013) indicates that teachers might adapt ICT if its foundation and training support are improved.

Overall, the findings of this study demonstrate that teachers use ICT in different ways, and have adopted digital technology through the use of computers, smartphones and the Internet. The role of MONE and the policy of school administrations are significant to the integration of ICT skills, with teachers expecting to be encouraged by schools and policies. In addition, teachers were willing to overcome any lack of provision of tools and devices. Training for integrating ICT in teaching and learning has a key role to play in enhancing ICT applications in the classroom, and the participants indicate the need of training to improve their skills. The teachers apply ICT in different ways for pedagogic purposes, including presenting lessons with the support of sounds and visuals, and maintaining student's attention. ICT has been used to support communication, social, literacy and maths skills of children with SEN, either on an individual basis or as a general presentation. The presentation of ICT increases the interest of students, and their skills have an impact on the use of ICT. The personal development of teachers affects the integration of ICT, and teachers with positive attitudes and perceptions tend to use ICT in classroom activities. It can be claimed that teachers are willing to use ICT in the future, and they are aware of the benefits of further training to integrate ICT into teaching and learning.

CONCLUSION

Teachers experience a number of difficulties in the education of students with SEN, which can be overcome through the means of alternative, and creative, use of ICT applications. ICT gives teachers the opportunity to reinforce the learning of SEN students, based on their needs. Different applications of computer technology are used to support maths, and the social, communication and literacy skills of children with SEN. Mobile technology (e.g. iPads and other tablets) has been employed, using educational software and applications to support similar needs. Alongside these features of ICT in supporting students on an individual basis, the participants have identified that they use ICT during educational activities for general presentations, educational animations, and videos.

This demonstrates the significance of the ability of teachers to adapt and integrate different, and rich, implementations for special education. Therefore, teachers' knowledge of, and positive attitudes towards, the use of ICT in special education plays a key role in integrating ICT. The literature illustrates that teachers identify a number of requirements for the full integration of ICT into education, including the following: professional development; positive attitudes; training opportunities; and positive perceptions concerning the benefits of ICT in overcoming such difficulties (Arnold 2015; Morris, 2010; Hew and Brush, 2007). In Turkey, both schools, and the Ministry of National Education, have a responsibility to support the use of ICT and follow policies to improve teaching activities. Teachers have expectations that schools will play a supportive role in implementing the use of ICT, and to create training and integrating opportunities.

It has been established that the participants apply ICT to some degree for educational purposes, and they are willing to use ICT for special and inclusive education. Teachers who hold positive perceptions and beliefs about ICT are more willing to use it in their teaching, and all teachers indicate that they have needed to use ICT at some point. The

teachers identify that their use of ICT is reduced by a lack of support and ICT devices. On the other hand, the use of ICT is increased by positive experience and awareness of its effective application. Therefore, the use of ICT can be achieved by supporting teachers with training, and its foundation can increase the use of ICT. This can lead to teachers becoming more willing to seek for the integration and adaptation of ICT for special education.

Special and inclusive education has recently been improved in Turkey, and the government has increased support for rehabilitation centres for special education, in order to support special and inclusive school students. In addition, significant improvements have taken place in the use, foundation and policy of ICT. Schools are being supported, and the FATIH Project has improved the foundation and integration of ICT.

Despite this current study being on a small scale, it can be concluded that teachers have positive perceptions and attitudes towards the use of ICT in teaching and learning, and also for special education. Supporting teachers pedagogically has the potential to enhance the use of ICT, particularly in relation to its effectiveness in special education. ICT can be enriched to diversify and differentiate educational activities, leading to students with special needs being supported in their use of ICT, based on their specific needs.

This study contains a number of limitations. Computer-based interviews lack an opportunity for the researcher to be in the same environment as the participants. During a synchronous interview, the researcher is able to ask additional questions, and so open up the responses, but in the asynchronous interviews, the researcher faced a number of issues in putting additional questions. However, all participants were asked additional questions, with the synchronous interviews allowing these to be asked at the relevant time. A further obstacle concerns the translation of the interviews from Turkish to English, including the issue of employing the correct phrases. However, the researcher's

experience of both inclusive and special education gave familiarity with the context, and therefore the ability to translate using the appropriate phrases.

Suggestions for further research include that the experiences of teachers could be further analysed with specialised ICT applications, and their attitudes, beliefs, opinions and perceptions of ICT identified, based on an ICT method created specifically for special educational needs. Future research could also investigate the perceptions and attitudes of teachers following the use of specific ICT applications for special education, with their opinions subsequently employed to improve software, programmes, and tools to utilise ICT for special education. Functionalising ICT could also lead to enriching special education with different and effective tools.

REFERENCES

BOOKS

Barnes, C., & Sheldon, A. (2007) 'Emancipatory' disability research and special educational needs. In: Florian, L. (Ed.) *The Sage handbook of special education*, pp. 233-246. London: SAGE Publications.

Causton, J., & Theoharis, G. (2013) *Principal's Handbook for Leading Inclusive Schools*. Baltimore: Brookes Publishing.

Cohen, L., Manion, L. & Morrison, K. (2000) *Research Methods in Education*. 5th ed. London: Routledge.

Flick, U. (2002) *An Introduction to Qualitative Research*. 2nd ed. London: SAGE Publications.

Grbich, C. (2013) *Qualitative data analysis: An introduction*. 2nd ed. London: SAGE Publications.

James, N. & Busher, H. (2009) *Online Interviewing*. London: SAGE Publications.

Denzin, N. K., & Lincoln, Y. S. (Eds.) (2008) *Collecting and Interpreting Qualitative Materials*. 3rd ed. London: SAGE Publications.

Denzin, N. K., & Lincoln, Y. S. (Eds.) (2003) *The landscape of qualitative research: Theories and issues*. 2nd ed. London: SAGE Publications.

Kuegel, C. (2014) Special educational needs and technology. In: Leask, M., & Pachler, N. (Eds) *Learning to Teach Using ICT in the Secondary School*, pp. 120-132. 3rd ed. Oxon: Routledge.

Kumar, R. (2011) *Research Methodology: A step-by-step guide for beginners*. 3rded. London: SAGE Publications.

Marshall, C, & Rossman, G. B. (1999) *Designing qualitative research*. 3rd ed. London: Sage publications.

Mason, J. (2002) *Qualitative Researching*. 2nd ed. London: SAGE Publications.

Newby, P. (2010). *Research methods for education*. Essex: Pearson Education.

Oliver, P. (2010) *The Student's Guide to Research Ethics*. Berkshire: Open University Press.

Rasmussen, I., & Ludvigsen, S. (2012) Learning with computer tools and environments: A sociocultural perspective. In: Littleton, K., Wood, C., & Staarman, J. K. (Ed.) *International handbook of psychology in education*, 399-435. Bingley: Emerald.

JOURNALS

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

Aksal, F. A., & Gazi, Z. A. (2015) Examination on ICT integration into Special Education Schools for Developing Countries. *Turkish Online Journal of Educational Technology*, 14(3).

Alzrayer, N., Banda, D. R., & Koul, R. K. (2014) Use of iPad/iPods with Individuals with Autism and other Developmental Disabilities: A Meta-analysis of Communication Interventions. *Review Journal of Autism and Developmental Disorders*, 1(3), pp. 179-191.

Arnold, H. (2015) Training teachers to be creative with ICT: defeating the simplistic view. *The STeP Journal*, 2(1), pp. 48-54.

Bakker, M., van den Heuvel-Panhuizen, M., & Robitzsch, A. (2015) Effects of mathematics computer games on special education students' multiplicative reasoning ability. *British Journal of Educational Technology*. 14(3), pp. 180-191.

Beacham, N., & McIntosh, K. (2014) Student teachers' attitudes and beliefs towards using ICT within inclusive education and practice. *Journal of Research in Special Educational Needs*, 14(3), pp. 180-191.

Boyd, T. K., Barnett, J. E. H., & More, C. M. (2015) Evaluating iPad Technology for Enhancing Communication Skills of Children With Autism Spectrum Disorders. *Intervention in School and Clinic*.

Braun, V., & Clarke V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3 (2), pp. 77-101.

Brinkmann, S. (2007) The good qualitative researcher. *Qualitative Research in Psychology*, 4, pp. 127-144.

Brodin, J., & Lindstrand, P. (2003) What about ICT in special education? Special educators evaluate information and communication technology as a learning tool. *European Journal of Special Needs Education*, 18(1), pp. 71-87.

Burton, C. E., Anderson, D. H., Prater, M. A., & Dyches, T. T. (2013) Video self-modeling on an iPad to teach functional math skills to adolescents with autism and intellectual disability. *Focus on Autism and Other Developmental Disabilities*, 10(10), pp.1-11

Chadwick, D., Wesson, C., & Fullwood, C. (2013) Internet access by people with intellectual disabilities: Inequalities and opportunities. *Future Internet*, 5(3), pp. 376-397.

- Charlop-Christy, M. H., & Daneshvar, S. (2003) Using video modeling to teach perspective taking to children with autism. *Journal of Positive Behavior Interventions*, 5(1), pp. 12-21.
- Chien, M. E., Jheng, C. M., Lin, N. M., Tang, H. H., Taelle, P., Tseng, W. S., & Chen, M. Y. (2015) iCAN: A tablet-based pedagogical system for improving communication skills of children with autism. *International Journal of Human-Computer Studies*, 73, pp. 79-90.
- Corn, J., Tagsold, J. T., & Argueta, R. (2012) Students with special needs and 1: 1 computing: a teacher's perspective. *Journal of Research in Special Educational Needs*, 12(4), pp. 217-223.
- Delano, M. E. (2007) Improving written language performance of adolescents with Asperger syndrome. *Journal of Applied Behavior Analysis*, 40(2), pp. 345-351.
- Demiraslan, Y., & Usluel, Y. K. (2008) ICT integration processes in Turkish schools: Using activity theory to study issues and contradictions. *Australasian Journal of Educational Technology*, 24(4), pp. 458-474.
- Dipace, A. (2013) Inclusive education: strategies and opportunities for preparing teachers through the use of ICT in the Italian compulsory school. *Journal of e-Learning and Knowledge Society*, 9(2), pp. 153-167.
- Eres, F. (2010) Special Education in Turkey. *US-China Education Review*, 7(4), pp. 94-100.
- Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012) Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, 59(2), pp. 423-435.

Flanagan, S., Bouck, E. C., & Richardson, J. (2013) Middle school special education teachers' perceptions and use of assistive technology in literacy instruction. *Assistive Technology*, 25(1), pp. 24-30.

Flores, M., Musgrove, K., Renner, S., Hinton, V., Strozier, S., Franklin, S., & Hil, D. (2012) A comparison of communication using the Apple iPad and a picture-based system. *Augmentative and Alternative Communication*, 28(2), pp. 74-84.

Foley, A., & Ferri, B. A. (2012) Technology for people, not disabilities: ensuring access and inclusion. *Journal of Research in Special Educational Needs*, 12(4), pp. 192-200.

Girgin, U., Kurt, A. A., & Odabasi, F. (2011) Technology integration issues in a special education school in Turkey. *Cypriot Journal of Educational Sciences*, 6(1), pp. 13-21.

Harris, J. (2010) The use, role and application of advanced technology in the lives of disabled people in the UK. *Disability & Society*, 25(4), pp. 427-439.

Hew, K. F., & Brush, T. (2007) Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, 55(3), pp. 223-252.

Hitchcock, C. H., Prater, M. A., & Dowrick, P. W. (2004) Reading comprehension and fluency: Examining the effects of tutoring and video self-modeling on first-grade students with reading difficulties. *Learning Disability Quarterly*, 27(2), pp. 89-103.

Hitchcock, C. H., & Noonan, M. J. (2000) Computer-assisted instruction of early academic skills. *Topics in Early Childhood Special Education*, 20(3), pp. 145-158.

Ingleby, E. (2012) 'How can you survive in the world if you can't use a computer?' Exploring the vocational education and training needs of early years practitioners in England. *Journal of Vocational Education & Training*, 64(4), pp. 475-490.

Johnson, G. M. (2013) Using Tablet Computers with Elementary School Students with Special Needs: The Practices and Perceptions of Special Education Teachers and Teacher Assistants. *Canadian Journal of Learning and Technology*, 39(4), pp. 1-12.

Johnson, R., & Hegarty, J. R. (2003) Websites as educational motivators for adults with learning disability. *British Journal of Educational Technology*, 34(4), pp. 479-486.

Jeffs, T., Morrison, W. F., Messenheimer, T., Rizza, M. G., & Banister, S. (2003) A retrospective analysis of technological advancements in special education. *Computers in the Schools*, 20(1-2), pp. 129-152.

Kagohara, D. M., van der Meer, L., Ramdoss, S., O'Reilly, M. F., Lancioni, G. E., Davis, T. N., Rispoli, M., Lang, R., Marschik, P. B., Sutherland, D., Green, V. A., & Sigafos, J. (2013) Using iPods® and iPads® in teaching programs for individuals with developmental disabilities: A systematic review. *Research in Developmental Disabilities*, 34(1), pp. 147-156.

Karaca, F., Can, G., & Yildirim, S. (2013) A path model for technology integration into elementary school settings in Turkey. *Computers & Education*, 68, pp. 353-365.

King, M. L., Takeguchi, K., Barry, S. E., Rehfeldt, R. A., Boyer, V. E., & Mathews, T. L. (2014) Evaluation of the iPad in the acquisition of requesting skills for children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 8(9), pp. 1107-1120.

King-Sears, M. E., Swanson, C., & Mainzer, L. (2011) TECHNOLOGY and literacy for adolescents with disabilities. *Journal of Adolescent & Adult Literacy*, 54(8), pp. 569-578.

Knight, V., McKissick, B. R., & Saunders, A. (2013) A review of technology-based interventions to teach academic skills to students with autism spectrum disorder. *Journal of autism and developmental disorders*, 43(11), pp. 2628-2648.

Kopcha, T. J. (2012) Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers & Education*, 59(4), pp. 1109-1121.

Kucuk, S., Aydemir, M., Yildirim, G., Arpacik, O., & Goktas, Y. (2013) Educational technology research trends in Turkey from 1990 to 2011. *Computers & Education*, 68, pp. 42-50.

Lewis, L., Trushell, J., & Woods, P. (2005) Effects of ICT group work on interactions and social acceptance of a primary pupil with Asperger's Syndrome. *British Journal of Educational Technology*, 36(5), pp. 739-755.

Liu, G. Z., Wu, N. W., & Chen, Y. W. (2013) Identifying emerging trends for implementing learning technology in special education: A state-of-the-art review of selected articles published in 2008–2012. *Research in Developmental Disabilities*, 34(10), pp. 3618-3628.

Lorah, E. R., Tincani, M., Dodge, J., Gilroy, S., Hickey, A., & Hantula, D. (2013) Evaluating picture exchange and the iPad™ as a speech generating device to teach communication to young children with autism. *Journal of Developmental and Physical Disabilities*, 25(6), pp. 637-649.

Mavrou, K., Lewis, A., & Douglas, G. (2010) Researching computer-based collaborative learning in inclusive classrooms in Cyprus: The role of the computer in pupils' interaction. *British Journal of Educational Technology*, 41(3), pp. 486-501.

McNaughton, D., & Light, J. (2013) The iPad and mobile technology revolution: Benefits and challenges for individuals who require augmentative and alternative communication. *Augmentative and Alternative Communication*, 29(2), pp. 107-116.

Melekoglu, M. A., Cakiroglu, O., & Malmgren, K. W. (2009) Special education in Turkey. *International Journal of Inclusive Education*, 13(3), pp. 287-298.

Messinger-Willman, J., & Marino, M. T. (2010) Universal design for learning and assistive technology: Leadership considerations for promoting inclusive education in today's secondary schools. *NASSP Bulletin*, 10(10), pp. 1-12.

Mintz, J., Branch, C., March, C., & Lerman, S. (2012) Key factors mediating the use of a mobile technology tool designed to develop social and life skills in children with Autistic Spectrum Disorders. *Computers & Education*, 58(1), pp. 53-62.

Morris, D. (2010) E-confidence or incompetence: Are teachers ready to teach in the 21st century?. *World Journal on Educational Technology*, 2(2), pp. 142-155.

Nam, C. S., Bahn, S., & Lee, R. (2013) Acceptance of assistive technology by special education teachers: A structural equation model approach. *International Journal of Human-Computer Interaction*, 29(5), pp. 365-377.

Odom, S. L., Thompson, J. L., Hedges, S., Boyd, B. A., Dykstra, J. R., Duda, M. A., Szidon, K. L., Smith, L. E. & Bord, A. (2014) Technology-aided interventions and instruction for adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, pp. 1-15.

O'Malley, P., Lewis, M. E. B., Donehower, C., & Stone, D. (2014) Effectiveness of using iPads to increase academic task completion by students with autism. *Universal Journal of Educational Research*, 2(1), pp. 90-97.

Özdemir, S., & Kılıç, E. (2007) Integrating information and communication technologies in the Turkish primary school system. *British Journal of Educational Technology*, 38(5), pp. 907-916.

Pennington, R. C. (2010) Computer-assisted instruction for teaching academic skills to students with autism spectrum disorders: A review of literature. *Focus on Autism and Other Developmental Disabilities*, 25(4), pp. 239-248.

Player-Koro, C. (2012) Factors influencing teachers' use of ICT in education. *Education Inquiry*, 3(1), pp. 93-108.

Rapley, T. J. (2001) The Art (fulness) of Open-Ended Interviewing: Some Considerations on Analysing Interviews, *Qualitative Research*, 1(3) pp. 303-323.

Reed, F. D. D., Hyman, S. R., & Hirst, J. M. (2011) Applications of technology to teach social skills to children with autism. *Research in Autism Spectrum Disorders*, 5(3), pp. 1003-1010.

Schibeci, R., MacCallum, J., Cumming-Potvin, W., Durrant, C., Kissane, B., & Miller, E. J. (2008) Teachers' journeys towards critical use of ICT. *Learning, Media and Technology*, 33(4), pp. 313-327.

Shiple-Benamou, R., Lutzker, J. R., & Taubman, M. (2002) Teaching daily living skills to children with autism through instructional video modeling. *Journal of Positive Behavior Interventions*, 4(3), pp. 166-177.

Sigafoos, J., O'Reilly, M. F., Lancioni, G. E., & Sutherland, D. (2014) Augmentative and alternative communication for individuals with autism spectrum disorder and intellectual disability. *Current Developmental Disorders Reports*, 1(2), pp. 51-57.

Tezci, E. (2011) Turkish primary school teachers' perceptions of school culture regarding ICT integration. *Educational Technology Research and Development*, 59(3), pp. 429-443.

Todman, J., Rankin, D., & File, P. (1999) The use of stored text in computer-aided conversation: A single-case experiment. *Journal of language and social psychology*, 18(3), pp. 287-309.

Uluyol, Ç. (2013) ICT integration in Turkish schools: recall where you are coming from to recognise where you are going to. *British Journal of Educational Technology*, 44(1), pp. E10-E13.

Waddington, H., Sigafoos, J., Lancioni, G. E., O'Reilly, M. F., Van der Meer, L., Carnett, A., Stevens, M., Roche, L., Hodis, F., Green, V. A., Sutherland, D., Lang, R., & Marschik, P. B. (2014) Three children with autism spectrum disorder learn to perform a three-step communication sequence using an iPad®-based speech-generating device. *International Journal of Developmental Neuroscience*, 39, pp. 59-67.

Williams, P., Jamali, H. R., & Nicholas, D. (2006) Using ICT with people with special education needs: what the literature tells us. *Aslib Proceedings*, 58(4), pp. 330-345.

Wood, E., Specht, J., Willoughby, T., & Mueller, J. (2008) Integrating computer technology in early childhood education environments: Issues raised by early childhood educators. *Alberta Journal of Educational Research*, 54(2), pp. 210-226.

Xin, J. F., & Leonard, D. A. (2014) Using iPads to Teach Communication Skills of Students with Autism. *Journal of autism and developmental disorders*, pp. 1-11.

OTHER SOURCES

BERA (2011) Ethical guidelines for Educational Research

Perera, N. T., Wijerathne, I. S., Wijesooriya, M. M., Dharmarathne, A. T., & Weerasinghe, A. R. (2012) ICT based education for students with special educational needs in Sri Lanka. In *Advances in ICT for Emerging Regions (ICTer)*, 2012 International Conference on (pp. 156-164). [online]. Available at: http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=6423026&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs_all.jsp%3Farnumber%3D6423026 [Accessed 25 June 2015].

APPENDICES

Appendix 1

Information sheet for the interviews

Project title: *Teachers' attitude towards, and knowledge of, the use of technology for the education of children with special needs in Turkey*

I am an MA Special Needs student in the University of Nottingham and my name is Abdullah Ciftci. My research focus on the use of technology and teachers' attitudes and knowledge of technology to help children with special needs. I would like to ask you a few questions about technology, how and why it is used and should be used in the classroom. It will take approximately 40 minutes.

The purpose of this study is to investigate teachers' knowledge of, and attitudes towards the use of ICT for special education in your classroom activities. ICT can be beneficial for special education; therefore during the interview you will be able to share your experience, opinions, beliefs about the use of ICT.

Participation is completely voluntary and you are free to withdraw from the interview or only answer some of the questions.

You will be interviewed in a chatting platform which is comfortable for you or the questions will be sent by email to you so it is up to you. The interview will be filed and translated later in order to use the data in my research. Your name and any sign of your identity will not be on any documents, because, the rules about your confidentiality is really strict to protect your rights. The confidentiality of your identity is important for us; we will just use your answers.

If you want, I can send you the transcript of the interview, therefore I will give you my contact details. If you do not feel comfortable with any of your answers, it can be taken out from interview and data.

I am thankful to you to take part in my research and with your important answers.

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University Ethics Committee

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Appendix 2

PARTICIPANT CONSENT FORM

Project title: *Teachers' attitude towards, and knowledge of, the use of technology for the education of children with special needs in Turkey*

Researcher's name: *Abdullah Ciftci*

Supervisor's name: *Anne Emerson*

- I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part.
- I understand the purpose of the research project and my involvement in it.
- I understand that I may withdraw from the research project at any stage and that this will not affect my status now or in the future.
- I understand that while information gained during the study may be published, I will not be identified and my personal results will remain confidential.
- I understand that the interview will be audio recorded and stored ashard and electronic copies of transcripts, and no one will have access to my non-anonymised data.
- I understand that I may contact the researcher or supervisor if I require further information about the research, and that I may contact the Research Ethics Coordinator of the School of Education, University of Nottingham, if I wish to make a complaint relating to my involvement in the research.

Signed..... (research participant)

Print name.....**Date**.....

Contact details

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Appendix 3

Interview questions

Questions	Rationale
<p>Can you give some information about available digital technologies in your classroom and school's policy and help for use of technology?</p>	<p>The use of ICT relies on available digital technologies in classrooms. Teachers might identify the role of school policy on their use of ICT. Policy might encourage teachers, but schools should create suitable environment in order to increase the use of ICT. Also, it might affect the adaptation and integration of ICT for special education (Ertmer et al., 2012).</p>
<p>Is there any particular digital technology that you wish to use, but not available in your classroom? If yes, what was it and why you wanted to use it?</p>	<p>Identifying teachers' expectations of ICT and its devices, programs and software can lead to improve future use of ICT. Educators can create different applications of ICT based on teachers' opinions and expectations (Hew and Brush, 2007).</p>
<p>Have you received any pedagogical training of technology, particularly for special education if yes could you give some details about the training you had?</p>	<p>Teachers from previous researches pointed out that in order to improve ICT applications and integrations and computing skills are significant. Pedagogical training for integration of ICT is identified by teachers to increase the benefits of ICT. The contents of training</p>

	<p>courses should be investigated in order to benefit from ICT in education (Karaca et al., 2013).</p>
<p>What is your opinion about technology use in education? How can children with special needs pedagogically take advantage of technology to reach their educational goals?</p>	<p>Positive attitudes and perceptions towards use of ICT have an impact on the adaptation and integration of ICT in education. Teachers with positive attitudes tend to use ICT in learning and teaching. Teachers who have knowledge of benefits and advantages of ICT might seek for different use of ICT and be willing to use ICT in their classroom (Schibeci et al., 2008).</p>
<p>How do you apply technology in your daily life? Can you give some details about your use of smart phone and related applications, personal computer, social media and technology for other purpose?</p>	<p>Teachers' daily use of ICT can give information about their attitudes towards ICT. It can be identified why teachers do not apply ICT in education by having information about their daily use ICT. Teachers who integrate ICT in their daily life are more willing to use ICT in education (Arnold, 2015).</p>
<p>When you use technology in your classroom, do you use for what purposes? How do you use ICT to support their communication, social, and academic skills, and enhance participation and collaboration</p>	<p>Teachers use ICT to support different needs of students. According to literature ICT can be utilised to support social, communication, math and reading skills of children with special needs. Identifying the</p>

<p>of students?</p>	<p>area of using in special needs can lead to researchers to improve programs and software for these needs and create experimental courses for those needs (Bakker et al., 2015; Pennington, 2010; Johnson, 2013)</p>
<p>Have you adapted any digital technology for a special needs student in a classroom setting? If yes, for what purpose, what kind of digital technology and how you adapted?</p>	<p>Teachers can adapt ICT based on their experiences. If they take the advantages of a specific use of ICT, they will be more willing to use for different educational purposes. Therefore, identifying the experience of teachers is significant to investigate for improvements (Morris, 2010; Kopcha, 2012).</p>
<p>Why should teachers use technology in their classroom and why some teachers do not use? What might be the advantages, disadvantages barriers, obstacles or difficulties of use of technology for you and for teachers who do not use?</p>	<p>Teachers identify the lack of sources and ICT devices as barriers for use of ICT. lack of time, classroom size, lack of support, training, students' skills affect the use of ICT (Hew and Brush, 2007).</p>
<p>Do you think technology will take more part in your classroom in the future? How it might be?</p>	<p>Teachers believe technology is significant part of life and they think they need to integrate ICT in education and teach ICT skills their students (Johnson, 2013;</p>

	Karaca et al., 2013).
What kind of digital technology or software that special needs students has mostly liked or struggle in using? Are they comfortable with the use of technology?	Previous researches stated that some students are willing to use ICT for educational purposes. They would like to use ICT devices because of game-like nature. ICT create the opportunity to embody the abstract topics with videos and animations. However, some students might not have skills to operate ICT devices (Wood et al., 2008).
Have you experienced any extra difficulty in using digital technology for special needs students more than other students? Can you give in detail?	Teachers might face with some problems during ICT applications for special needs. Therefore, they might avoid using ICT for special needs. Identifying the possible difficulties can lead to researches to remove those (King et al., 2014; Wood et al., 2008).

Appendix 4

Table of codes, themes and extracts

Themes	Codes	Extracts
<p>Teacher's use of technology in daily life</p>	<p>*daily use</p> <p>*ICT for education</p> <p>*part of life</p> <p>*use of social</p>	<p>"In daily life I use technology and I have a laptop. My sons have a tablet computer. If I miss the break news I checked the Internet and I use the Internet often. Especially I used for mobile banking from smartphone. The online platform of MONE e-school can be used now as an application. I used my computer to prepare homework for my students from educational websites. " (I1)</p> <p>"Nowadays, technology has become an indispensable part of life. For both educational and daily used I use technology as much as I can. I have a smartphone and a laptop. I think I used social media effectively and actively." (R3)</p> <p>"I check the news on the internet. I often use the Internet to pay the bills. I especially use mobile banking on my smartphone. I have many applications on my smartphone and I use active social media. I contact my friends via</p>

		<p>from life. Therefore, we have to use technology if we do not want to. So I utilise technology.”</p> <p>(I2)</p>
<p>ICT Infrastructure and Policy</p>		
<p>Subtheme-1 The role of MONE and Schools</p>	<p>*policy</p> <p>*role of schools</p>	<p>“Every year they create many policies about the use of ICT, but unfortunately we did not have any help in terms of classroom ICT. Although I requested to bring ICT, my school did not attempt to bring any ICT. Generally, if schools are not idealistic to improve education, especially rural schools, the schools have to wait for a long time to obtain ICT opportunities.” (I5)</p> <p>“Sometimes, suddenly I decide to show something on the Internet. I have a computer, thus I can. This is a crucial opportunity for me, also for the children. Unfortunately, in many schools the Internet is only available in the</p>

	<p>ICT for classrooms</p>	<p>“There is a computer in the classroom, and when I need it, I can bring a projector into the classroom. In the school there are TV, copy machine and scanner.” (R2)</p> <p>“In my classroom only projector is available. In my classroom, there was no computer or projector. I brought them. However, I can say that technological devices are expensive; therefore it is not affordable for teachers. However, in some school due to available projector, teachers need to use their own computer. ” (I4)</p> <p>“The technology I can apply in my classroom is my own tablet and android smartphone.” (R1)</p>
<p>Subtheme-3 Support</p>	<p>*training</p>	<p>“During the university I did not take a detailed training of ICT devices, it was only about the simple use interactive whiteboard and computers. Also, it was theoretical because of lack of time. In computer course we learnt how to use computer programs.” (R2)</p> <p>“Sometimes, my computer is broken and it is difficult to do lessons, if the lessons rely on the computer.” (R2)</p>

		<p>creating slides. In some educational implementation classes we used slides during acting out teacher activities." (I3).</p> <p>"I have not attended any courses in terms of use of ICT. During university there was a course but it was not efficient in terms of pedagogy. However, after the FATIH Project, an expert presented some basic information about ICT with a video-conference system." (I2)</p> <p>"Some teachers do not have information about effective ICT applications, and they do not search for it. During university, we had an education in computer skills, and the tutor linked ICT with pedagogy, but it is not sufficient because some teachers do not prefer to use ICT and they have different priorities. They are waiting for ICT devices, but they do not make an effort to bring it. " (I5)</p>
<p>Teachers' Pedagogical Perceptions Towards ICT in relation to Special</p>	<p>*ICT for gaining attention</p>	<p>"I use ICT in starting a new subject to get the attention of students. I use in supporting students to repeat lessons, for reinforcement and for evaluation of learning. So I try to use for different educational purposes. Sometimes I</p>

<p>Education</p>	<p>*enriching the teaching</p>	<p>use for fun and playing game. Sometimes, I use relevant videos for new topics, for example, there are some digital game for learning letters and I use them.” (I2)</p> <p>“Children with special needs have a short attention span, thus, I think that by applying ICT we can increase their attention span. Also, it can help support learning in a short time. For example, I had a six year old girl student, we used my computer and smartphone to learn letters and numbers. Activities for numbers and sings for letters and repetition activities.” (I4)</p> <p>“I use ICT, especially in learning new topics to gain attention of students because first learning is really important. Short video and a slide gain attention of students. I show useful videos and documentaries. Children, especially like video about animals, the world and space. In music class I use the computer for song learning and in painting class we view examples of painting from Internet.” (I1)</p> <p>“ICT allows making lessons more enjoyable for</p>
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	<p>*ICT for motivation</p>	<p>students, and increases permanent learning and attention span. I use ICT in teaching and for repetition activities. I use slides, educational videos and simple educational activities of ICT. It allows using for spiral learning which is the educational approach of the country. " (I3).</p> <p>"Technology makes the life easier, for that reason it can support education as well. ICT devices get the attention of students with SEN. For example the children get motivated easily, and do activities with intent. They meet with different materials compared with previous materials, thus, they are connected to the learning. Students demand different activities because similar teachers, materials and activities might make them bored." (R1)</p> <p>"ICT which I use is more effective than traditional methods and materials. ICT can be used as visual and sound materials, thus it allows to embody the abstract topics and notions." (R3)</p> <p>"If we give students enough time for learning,</p>
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	<p>*differentiating the lessons</p>	<p>every child has the potential to learn. An individualised learning plan might be implemented easily with a tablet or a laptop belonging to the student. The individualised programs can be applied effectively by using ICT. We should enrich the lessons and presentations. Children with special needs have rights to learn what their peers learn. In order to reveal critical and creative thinking, teachers need to adapt the opportunities of ICT and, I think, education with traditional methods cannot be applied in the future. " (I5)</p> <p>"When other students do their work, I use ICT to support my student with special needs, and it saves time. Especially I used for reading skills and math skills. For communication skills I used video which contains conversation and the elements of communication." (I5)</p> <p>"I can use any ICT tool, which, in my opinion, is effective, due to the significant point being to assist my students." (I4)</p> <p>"Tablets now are used commonly, but I do not</p>
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	<p>*time factors</p> <p>*ease to use</p> <p>*increasing engagement</p>	<p>approve of the use of tablets in the general classroom. In my opinion, they are not appropriate for some ages and levels. However, we do one-to-one implementation for students with special needs, thus, in their case, a tablet can be used, and control might not be difficult.” (I1)</p> <p>“For example, we can teach hand washing skills and other, similar, skills (which are difficult to demonstrate in the classroom) by video modelling. Also the students feel comfortable during the use of tablets and they feel they are valuable. Therefore, the students attempt to do educational activities independently. They try to engage in educational activities as I observed.” (R1)</p> <p>“It allows teachers to search for information while teaching. Teachers can use to provide sound and visual support for learning. ICT gains the attention of the students.” (R2)</p>
Subtheme-1 ICT		“Maths skills need to be embodied; therefore, I

Implementation	<p>*embodying</p> <p>*math skills</p> <p>*reading skills</p> <p>*game-like nature of ICT</p>	<p>have used ICT many times in teaching maths skills." (I2)</p> <p>"I used it for teaching voice and sounds. Sometimes we had difficulties in communication; I used animal sounds to connect with students. Also, I use for teaching math skills and I utilised the use of slides for education. Generally, I prepare activities from educational websites and it is one of the advantages of ICT. Teachers can reach other teachers' work via Internet." (R1)</p> <p>"We had difficulties in maintaining reading activities with one of our children with autism, but when we loaded the pictures and texts into the computer, the student kept reading for a long time. I used computer activities to increase the students' motivation. One of my students like the nature of ICT and when we discover it, we used ICT to support the student. The student like singing and used tablets to support language skills." (I4)</p> <p>"I use video-modelling for daily life skills. In</p>
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	<p>*daily life skills</p>	<p>order to support literacy, math and communication skills of children, I try to utilise ICT. It can be used to embody the geometric shapes in math topics. We watch silent films of Charlie Chaplin with students with hearing and verbal difficulties.” (R2)</p> <p>“I used some educational websites to find interesting activities for my students, but unfortunately the resources in these websites are limited in terms of special education. Sometimes I used my smartphone for my students with SEN, while I was teaching other students.” (I5)</p> <p>“I generally use a computer and projector. I did not implement any special individual ICT activities. I used for reading, literacy and daily life skills.” (R3)</p>
<p>Subtheme-2 Student Factors</p>	<p>*the role of students</p>	<p>“I did not face big problems during computer activities, but my student always refused to turn the computer off. Also the student struggled in carrying on the activities. However,</p>

	*suggestions	improve their education." (I5) "I would like to have tablet computers. Because I have students with orthopedical difficulties, the portability of a tablet computer might help them." (I3)
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