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Integration of ICT in Educational Process and the Role of School Management in Primary and Secondary Special Education

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TABLE OF ACRONYMS

ECDL	European Computer Driving Licence
ICT	Information and Communication Technologies
IT	Information Technology
SEN	Special Education Needs

INTRODUCTION

Special education is a field that has attracted the interest of the global pedagogical community due to its undeniable necessity and importance. The education of students with special educational needs is an inalienable human right. The increasing and constantly evolving needs in special education require the exploration of the necessary new teaching methods and the integration of Information and Communication Technologies in the learning process.

The integration of ICT in special education presents intense research interest since it constitutes one of the most significant challenges of our time. The fact that research on this specific topic in Greece is limited, combined with the diverse and particularly relevant benefits they offer to both students and educators, makes this topic highly appealing and needs further investigation. The main purpose of this study is to examine the degree of the ICT integration in Greek special schools in primary and secondary level. This integration is also investigated taking into consideration factors like gender, educational level and teacher's training in order to observe potential differences.

In addition, this thesis explores the perceptions and attitudes of educators towards ICT, because in the view of the fact that according to the literature review there is a contradiction in which, although they seem in principle to be in favour to their use, they do not implement them frequently enough, neither quantitatively nor qualitatively, in their daily teaching. At the same time, the dissertation also presents how different types of barriers and obstacles like insufficient infrastructure and educational software and the lack of I.C.T training do not contribute either into their integration.

Furthermore, it is analyzedwhether the implementation of ICT increases the school performance of students with special educational needs through an experimental activity. Specifically, it highlights how the utilization of computers and ICT completing exercises leads to fewer errors compared to those who rely on traditional worksheets. Finally, it is considered the role of the school management and how it influences on the examined subjects.

CHAPTER 1: SCHOOL UNIT, LEADERSHIP AND SCHOOL MANAGEMENT IN SPECIAL EDUCATION

School unit leader and efficiency

Leadership in school units is pivotal for their improvement and competitiveness. Effective leaders exhibit creativity, openness to new approaches, and interpersonal skills, encouraging innovation and divergent thinking among staff. They involve staff in decision-making processes and transparently share goals, contributing to enhanced efficiency and effectiveness. The type of leadership and leaders' mindset significantly impact school effectiveness, with principals playing a critical role.

Research highlights the positive correlation between leader behavior, staff commitment, and school effectiveness. Supervision by principals is crucial for teacher professional development and positively impacts school effectiveness. Teacher commitment, influenced by leader support and participation in decision-making, is linked to school leadership quality and staff retention. Effective leaders motivate teaching staff, influencing the quality of teaching and promoting innovative programs. School leadership indirectly contributes to children's learning outcomes, with distributed leadership models showing promise (Setwong & Prasertcharoensuk, 2013).

Various parameters, including teacher quality, program implementation, and school climate, affect school effectiveness. Principals play a vital role in ensuring effectiveness by possessing the necessary characteristics and skills, reinforcing through training, and fostering a shared vision for the unit's success. Awareness of factors contributing to school effectiveness among all stakeholders is crucial for sustained improvement. (Boonla & Treputtharat, 2014).Additionally, the integration of ICT (Information and Communication Technology) is becoming increasingly important in enhancing school effectiveness and preparing students for the modern digital world

The role of teachers and school management in school integration

Teachers are pivotal in fostering school integration by cultivating attitudes of acceptance towards diversity and facilitating learning for all students, including those with disabilities. Their role extends to shaping the overall school community and indirectly influencing broader societal perspectives on inclusivity. Positive teacher attitudes towards integration are influenced by various factors such as training, prior experiences, and collaboration with colleagues Therefore, teacher education and ongoing professional development are crucial for successful integration efforts, emphasizing collaborative learning approaches, curriculum diversification, and individualized instruction tailored to diverse student needs (Setwong & Prasertcharoensuk, 2013).

Collaboration among interdisciplinary teams comprising general and special educators, psychologists, and other specialists is essential for supporting integration efforts by providing diverse perspectives and resources. Cooperative teaching methods, such as co-teaching and differentiated instruction, are highlighted for their effectiveness in enhancing learning outcomes for all students within an inclusive classroom environment Furthermore, school leadership plays a critical role in creating a supportive climate for integration through visionary leadership, effective communication, and collaborative decision-making among staff, students, and parents In addition to traditional approaches, alternative practices such as mobile classes and distance education are being explored to meet the diverse needs of students and promote inclusivity (Dellasoudas, 2005). Successful integration efforts necessitate cooperation among all stakeholders, including teachers, parents, administrators, and community members, to design and implement inclusive programs tailored to the

unique context of each school. By fostering a collaborative and inclusive environment, schools can effectively support the holistic development and academic success of all students, regardless of their backgrounds or abilities (Cologon, 2016).

Advantages and obstacles of special and inclusive education

The differing views of parents of children with special educational needs and teachers create controversy and, ultimately, uncertainty about the benefits of inclusive education. This is mainly due to the lack of adequate support in inclusive schools. The large number of classrooms, the lack of specialized human resources and the unavailability of the necessary material equipment, combined with the limited knowledge of teachers to use and benefit from it, significantly limits the smooth operation of an inclusive classroom (Baglieri, S, 2017; Westbrook & Croft, 2015).

Therefore, inadequate teacher training and retraining and the lack of appropriate services create insecurity and skepticism in parents of children with disabilities about success of inclusion (Van Mieghem et al., 2020). For this reason even today they are led to the choice of a special structure for their child's education, which in their opinion will offer personalized medical, physical and psychological support through special educational programs (Ekins, A. 2017; Kelly et al., 2014).

In addition, the application of an inclusive ideology in the classroom often runs into practical issues. Limited financial resources automatically lead to limited options and little flexibility in the educational process. As a result, the necessary support mechanisms are not funded, the building infrastructure is not improved, the human resources are not strengthened and innovative, flexible educational environments are developed which are necessary for all students. In addition, the lack of sufficient teaching time for the application of alternative methods, the difficulty in accessibility in all areas of the school structure and the curriculum, which does not always cover the needs and interests of all children (Van Mieghem et al., 2020), further alienate any disposition for effective inclusion. Teachers in their attempt to serve the non-adapted curriculum may have unrealistic demands and put excessive pressure on students with special educational needs (Kelly et al., 2014; Van Mieghem et al., 2020).

Therefore, under these conditions, a negative psychological state of these students may be created and in combination with the reactions of classmates inside and outside the classroom, their normal psychosocial development may be precarious. Parents worry about their social inclusion (Van Mieghem et al., 2020), the marginalization and loneliness they will feel if they do not find a supportive environment with values of inclusion, such as acceptance and cooperation but face a rejection behavior from other children (Ekins, A. 2017; Kelly et al., 2014). Nevertheless, a wealth of research converges on the assumption that inclusive education has a positive effect not only on people with special educational needs but also on students without educational needs (Van Mieghem et al., 2020). In addition, it contributes to the personal development of teachers, enabling them to acquire additional skills (Westbrook & Croft, 2015). While in the long run it benefits society by enriching it with universally accepted values which have been assimilated from an

early age to future citizens. Separate special education creates conditions of stigma (Byrne, 2022) and is contrary to respect for human rights and more specifically to the rights to common education that all children have (Lyons & Arthur-Kelly, 2014). Therefore, the application of inclusive education is the safest solution to avoid marginalization and stigma (Kelly et al., 2014). In addition, it maximizes the interaction between children with disabilities and children without disabilities and increases the necessary parental involvement in the educational process (Baglieri, S, 2017; Kelly et al., 2014).

Improving the social participation and communication of children with disabilities in the formal school environment is one of the most important benefits of inclusion. The acquisition of social skills for building friendships and even adopting a socially acceptable behavior is a result of the inclusive environment (Van Mieghem et al., 2020). The coexistence and co-education of students with disabilities with classmates, who happen to have no special educational needs, mobilizes the former to achieve higher education and other goals, while increasing their responsibility, self-esteem and self-confidence. In this way their psycho-social empowerment is achieved and they learn ways to manage social situations with which they should be familiar, because they will be confronted in their adult life. In addition to the psychosocial improvement of students with disabilities in inclusive environments, the academic benefits in relation to individual special education are also important, because inclusive education is an interactive process of cooperation and participation of all involved parts (teachers, special educators, classmates) which favors the transmission and assimilation of knowledge (Westbrook & Croft, 2015).

Students without educational needs clearly benefit from this collaborative process, because they develop pre-professional skills by helping their classmates, which they will be able to take advantage of as they grow up. At the same time, they cultivate respect for and acceptance of diversity and understand the diversity of social life (Van Mieghem et al., 2020), which makes them more mature and ready to take advantage of this diversity for the benefit of all (Cohn-Vargas, B, Creer-Khan, A. Epstein, A. & Gogolewski, K. 2021).

CHAPTER TWO: TEACHERS, STUDENTS AND SCHOOL MANAGEMENT CORRELATION WITH THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN SPECIAL EDUCATION

Information and Communication Technologies in special education

Undoubtedly, students' access to new technologies both at home and at school has increased significantly in recent years (Hennessy et al., 2005). ICT can be used in the whole range of education. As in many other countries, now in Greece ICT is used at all levels of education in both general and special education (Beck, 2002; Zaranis&Economidis, 2009; Nikolopoulou, 2013). However, the way and the degree of use differ depending on the course taught (Jimoyiannis&Komis, 2007). Extensive research on the use of ICT in education and the integration of people with special

educational needs becomes evident from the international literature (IstenicStarcic&Bagon, 2014). They are used in all subjects but mainly in language (Beck, 2002) and in mathematics (Reis et al., 2010) in children with various disabilities. Through the Greek literature, it is clear the -even small- didactic use of ICT in special education and specifically in special schools and primary and secondary schools, in children with autism, mental retardation, learning difficulties and numeracy (Agapiadou&Economidis, 2011; Vakalis&Sivri, 2008; Douka&Bratitsis, 2013; Zisimopoulos et al., 2011; Kazakou&Soulis, 2013; Dassiou&Tsiokos, 2013; Fragaki, 2011; Psathopoulou&Kalamaki, 2013). The purpose of the utilization is to reduce the obstacles and exclusions experienced by students with disabilities but also to increase their participation in the educational process (Boutskou, 2010). All these examples reveal new teaching practices, which promote students' progress in special education and promote their smooth but effective integration into general education.

Many different new technologies are now used in special education in addition to the computer, such as the interactive whiteboard, the Internet, special software, videos, virtual learning environments, etc. (Williams et al., 2006). In recent years, the interactive whiteboard has been an innovative teaching tool that stands out. In Greece, private schools and tuition centers seem to use it more (Anastasiadis et al., 2010) and in recent years it is also used in primary schools (Niarrou&Grousouzakou, 2007) but there is still no research data on its pedagogical utilization in the school class (Anastasiadis et al., 2011).

Abroad there are specialized companies that are active in the field of special education creating software (Efopoulos et al., 2014) while many of them have been evaluated and their results have been published in international journals. In Greece, only a few individual attempts have been made to create special software. In 2007-2008, the pedagogical institute in the framework of the project "Actions to support students with disabilities" sent software to schools with integration departments and special education units, to support the teacher in teaching. Most of them concerned motor problems, hearing and vision problems while only 4 were addressed to children with autism or mental retardation (Efopoulos et al., 2014). However, very few software have been evaluated, which mainly refer to the improvement of cognitive skills of students with autism (Dassiou, &Tsiokos, 2013).

At the same time, the curricula of special education help the integration of ICT in education. They suggest the computer as a supervisory teaching tool, as a cognitive/exploratory tool and as a tool for communication and information retrieval in the context of daily school activities, using appropriate software and highly open exploratory learning software. More specifically, in the curriculum for children with autism the computer is suggested in activities for writing and producing written speech. Also, computer familiarity can be used as a recreational activity or as a pre-professional skill. The objectives of Curriculum concern the acquisition of skills for the operation of the computer and are presented following the general principle of Special Education from the simple to the complex and includes five sections

"Introduction to the computer", "Game and information", "Writing and painting "," Calculations and tables" and "Electronic communication". Furthermore, there is flexibility, as the transition from one theological unit to the other does not necessarily presuppose the conquest of the previous one (Curriculum for students with autism, 2004).

For students with hearing problems it is recommended to use the computer for mathematics and natural sciences (experiment simulation) as well as the projection of subtitled videos (Curriculum for students with hearing problems, 2004). In addition, for visually impaired students, appropriate synthetic voice support software is recommended as well as the use of the computer in group activities with the cooperation of blind and sighted children (Curriculum for blind students, 2004). For students with mild to moderate mental retardation, the computer is recommended as an assessment tool but also as a teaching and supervisory tool as it provides immediate sensory and learning experiences that encourage practical thinking (Curriculum for students with mild to moderate mental retardation, 2004). At the same time, for students with severe mental retardation, the use of the computer in their teaching is recommended as the combination of audio-visual media strengthens the child with severe mental retardation in the development of verbal and non-verbal communication (Curriculum for students with severe mental retardation, 2004).

Several researchers (Hernández-Ramos et al., 2014; Somekh, 2008) argue that while several countries have integrated ICT into their education systems, their results are not as expected. In addition, while current educators are more familiar with technology, they do not appear to be prepared or able to integrate ICT into the educational process (Mueller et al., 2008). This raises many questions as while in many cases new technologies are used for pedagogical purposes successfully (Karasavvidis, 2003; Somekh, 2008), nevertheless there are research findings that show that new technologies are either not integrated or are not used adequate in teaching and learning (Judge, 2013; Wikan&Molster, 2011).

Furthermore, in McGarr & Kearney (2009) research, participants stated that the role and use of ICT in school focused only on the acquisition of technological skills and was cut off from other aspects of the curriculum. Given these results it is not surprising that the use of ICT even today has not developed beyond an additional activity in schools. The same is true in special education as it has been found that special educators do not use ICT enough or effectively (MacArthur & Malouf, 1991; Parker, et al., 1990 in Nam et al., 2013). In Greece as well, the results are not encouraging as through small or large scale surveys it seems that most teachers do not use ICT in the educational process (Rousomanis, 2007) while most appear positive in terms of their use (Jimoyiannis&Komis,2006), however, tend to use them mainly for personal and administrative purposes rather than for didactic / pedagogical purposes (Jimoyiannis&Komis, 2006; Charalambous & Ioannou, 2008).

Benefits of Information and Communication Technologies in Special Education

There is a huge variety of benefits that ICT offer to the all involved parties in Special Education. More specifically, with the appropriate use of ICT in special education, various benefits may arise for students, teachers as well as the school unit itself. More extensive reference follows in the subsections of this section.

Benefits for the students with special educational needs

In special education, the use of ICT initially responds to the need to provide equal educational opportunities to all students. The inability to use and utilize ICT by children with special educational needs, leads to their exclusion and increases the digital divide between population groups (Angelopoulou, 2011).More specifically, the use of ICT helps in the multi-sensory approach of the subjects, in the acquisition of problem-solving skills and social skills (Angelopoulou, 2011) and at the same time increases the communication and interaction of students with special needs with their classmates and teachers (Mavrou et al., 2010). In addition, ICT offers greater autonomy, so that students with disabilities can perform daily activities on their own (Fernández-López et al., 2013).

There are many benefits in various areas of student development (eg cognitive, emotional and communicative). Computer use positively affects students' cognitive development and motivation (Angelopoulou, 2011; McCarrick & Xiaoming, 2007). The latter is especially important for students with learning disabilities and mental retardation who have reduced motivation to learn due to negative emotion and repetitive failures. ICT can reduce the negative self-esteem experienced by these students and increase their motivation to learn (Dreamson, 2021).Initially, children who have not developed any writing skills or write little can write and express themselves through the computer (Williams, 2005). Teachers in the research of Williams (2005) reported that students with very severe learning difficulties through “Powerpoint” were able to make very good presentations. In addition, students with difficulties in fine motor skills and in particular in handling scissors, glue, etc. with the use of appropriate programs and software on the computer were able to overcome these obstacles.

Furthermore, the use of ICT in the classroom helps many students with special educational needs who have communication problems as through the use of the computer they can express preferences and views (Williams, 2005) and at the same time communicate in many ways, through the tools offered by the internet (e mail, blog, etc.) (Forzani &Leu, 2012). In addition, the student himself can and actively participates through the computer in various activities with the main goal of integrating into the general class (Yadav et al., 2021). In the research of Bratitsis&Kandroudi, (2011), two students with significant learning and social difficulties, through the computer, were able to participate equally in the general classroom as well as to develop their communication and social skills. Research also shows the benefits of ICT in students with various disabilities but learning difficulties, physical disabilities, speech and language problems, deafness, blindness and autism.

In students with learning disabilities, the computer functions as an external human memory that can reduce the workload in the memory of these students (Kumar

& Wilson, 1997) as these students have limited working memory and have difficulty with complex mental calculations. It also helps to keep their interest, motivation for learning (Hennessy et al., 2005) and their attention to the lesson, areas where students with learning disabilities have significant problems (Kumar & Wilson, 1997;Dreamson, 2021).In addition, ICT offers significant benefits to students with physical disabilities as well as to students with speech and language problems. Students with physical disabilities who were isolated from their classmates, after using ICT improved their communication skills, strengthened their friendships and were accepted by their classmates (Petrou & Dimitrakopoulou, 2005). Similarly, new technologies help students with speech and language problems to improve their communication skills in order to interact and communicate effectively in the classroom (Hasselbring & Williams Glaser, 2000; World bank. 2022).

ICT is especially useful for students with vision and hearing problems. Specific devices and special software help these students to learn, communicate and participate equally in the educational process (Hasselbring, et al., 2000). At the same time, there are many benefits to using ICT in people with autism. Often these individuals seem to enjoy interacting with a computer because the latter work in a specific way and set rules (Christinaki et al., 2013) as well as because the stimuli they receive are constant, predictable and controllable (Kalyva, 2005). Furthermore, computers can offer an environment of coherence and stability, something that people with autism want because of the predictable reactions, the monotonous and speechless emotions that come from computers and the limited social stimuli (Mavropoulou, 2011).

Various studies have shown positive results from the use of educational software in the education of people with disabilities (dyslexia, down syndrome, autism, etc.) in the development of language skills, communication and social skills (Grynszpan, et al., 2014; Nikolopoulou, 2011; Ramdoss, et al., 2011). The use of appropriate special educational software enables students with special needs to engage in teaching objectives and activities commensurate with the level of their abilities (Angelopoulou, 2011). In Greece there are several software available for various disabilities through the website of the Ministry of Education and the Pedagogical Institute but the question is whether they are used by the teachers of the special education units.At the same time, there are many benefits from interactive whiteboards, tablets and mobile phones in special education. The interactive whiteboard helps both the teacher and the student as it facilitates the management of the lesson, offers flexibility, abundant educational material and at the same time reveals the active role in learning of technology (Anastasiadis et al., 2011). At the same time, it can be used in many educational environments, which makes it a useful tool in special education (Niarrou&Grousouzakou, 2007). However, there is no data on how many special schools have and use interactive whiteboards.

On the other hand, touch technologies are relatively new to the education of children with disabilities and so there is insufficient research on their effectiveness. However, the nature of these devices as well as their strong visual and auditory characteristics appear to positively affect the attention, memory, perception and

motivation of children with disabilities (Campigotto et al., 2013; Fernández-López et al., 2013). These technologies contribute greatly to the education of children with autism, mental retardation and learning disabilities as their use helps to improve communication, language and social skills (Haksiz, 2014; Mintz et al., 2012). They also provide freedom of movement within the school premises and at the same time the activities can be transferred to the home area (Fernández-López et al., 2013). However, students must have developed specific cognitive skills to use the applications of these devices effectively (Campigotto et al., 2013; (Lesmerises, 2021).

Benefits for the teachers in special education

There are many benefits that ICT offers to the teacher, such as the fact that they enable him to create educational material suitable for all levels of students, provide him with educational support through the internet, give him greater prestige and enhance his professional prospects (Cox et al., 1999). More specifically, the special educator can organize the individual file and the individualized program of each student (Paraskevopoulos, 2002). The internet provides easily accessible and free material on tools, teaching methods and assessment for people with disabilities as well as information on the collaboration of special educators with parents and other professionals (Billingsley et al., 2011). At the same time, the computer serves as an assessment tool (Peltenburg et al., 2010) as students' work on the computer is an electronic portfolio of each student (Williams, 2005). It can also be used to identify learning difficulties or difficulties in social skills, since several tests have been made electronically in order to assess various difficulties (eg "Olympus" test) (Zaranis&Economidis, 2009,Dreamson, 2021).

Benefits for the school units

Furthermore, in addition to the benefits that new technologies offer to the teacher and the student, there are many benefits for the schools themselves. Isolated schools in mountainous areas or islands can communicate and interact with other schools in the rest of Greece regardless of geographical location (Tzimopoulos, 2001). However, it should be emphasized that the mere existence of new technologies in the classroom is not enough either to bring about the benefits mentioned above or to integrate them effectively into education. Either in classes that use ICT, or in classes that use traditional tools (blackboard, book), the student can be treated as a passive recipient or as an active participant in the creation and understanding of knowledge (Postholm, 2007;Yavad, 2021).

Information and Communication Technologies and Teacher Training

ICT have a wide range of uses and applications, provide solutions and make people's lives easier. The integration of ICT in the field of education provided solutions to many problems, but also provoked various reactions. The technology was not accepted in the same way and to the same degree by all teachers. Many believe that its use contributes to the educational process, while others believe that ICT when it enters the field of education without political and educational planning then creates

problems). The Greek educational community recognizes the usefulness of ICT in teaching practice, but in a large part of teachers there are phenomena of technological illiteracy and avoidance of their use (Nikolopoulou, 2009).

Education systems around the world are under increasing pressure to use ICT to teach students the knowledge and skills required in the information society. Successful use of ICT in education is a difficult and complex task.In recent decades, in most developed countries, educational initiatives for the integration of ICT in schools have taken place (Pelgrum&Plomp, 1991). More and more research argues that the use of ICT provides the opportunity to improve teaching and learning processes (Vrasidas& Glass, 2004; Giavrimis et al., 2010; Keramida, 2010). During all these years there has been intense scientific reflection on how the use of ICT can contribute to the educational process and how it can be used effectively by teachers and students. Successful use of ICT in education is a complex process because it depends on the synergy of many factors, such as basic education and training of teachers (Cartelli, 2008), curricula, technological infrastructure development, educational policy, and development and the injection of appropriate educational software into schools.

In Greece, the rate of ICT utilization is constantly increasing as more and more special schools equip their classrooms with computers and interactive whiteboards and more and more learning environments come to be integrated in the curricula, bridging the content of the various subjects with the various forms of description, presentation and transmission offered by ICT. In other words, these are constructive learning processes such as representations, modeling, communication, collaboration and the use of multimedia. Teachers now have at their disposal all these tools (blogger blog creation tool, "SCRATCH" multimedia writing tool, special tools for writing professional and fully interactive presentations and simulations, etc.) as well as educational software (puzzle creation software, software digital storytelling, quiz creation software, etc.) that can be used creatively and effectively (Giavrimis et al., 2010; Keramida, 2010).

Many researchers are positive about the application of ICT in school while others are critical. Mioduser et al. (2000) claims "one step forward in technology, two back in pedagogy". On the other hand, it is now accepted that the applications of ICT in the educational process can contribute in a substantial way to the support of the teaching practice and to the enhancement of the learning process (Jonassen et al., 2003; Jonassen, 2006; Webb, 2005; Hunter &Dimaraki, 2002; Tailor & Tailor, 2001; Haldane, 2007; Lewin et al., 2008; Lee & Winzenried, 2009).The integration of technology in the educational process was considered an important priority, as stated in the Lisbon Declaration in 2000 for EU countries (European Commission, 2003). Thus in Greece, a large number of programs have been designed and established for the training of typical and special education teachers, such as the Operational Program "Information Society" (2002-2006), the Operational Program "Education and Initial Vocational Training" (2006-2008), the project "Training of Teachers for the Utilization and Application of ICT in Teaching Practice" (2007-2013). In addition to these conventional training programs, distance learning programs are organized in

order to overcome the space-time constraints and obstacles posed by traditional programs in living meetings.Distance education is implemented through e-learning communities in a virtual space of meeting and interaction (Apostolakis et al., 2008). Thus, each teacher has the opportunity to choose the way of training that suits him best. In Greece, in the framework of the B 'level Training Act, the implementation of a number of B' level training programs with the model of blended learning is foreseen, - that is, by combining distance courses (modern sessions and asynchronous actions, with assignment of tasks and activities) and a limited number of live sessions (face to face) - in order to meet the training needs in areas where for any reason it is not possible to implement training programs with the traditional model.

Most teacher training programs are basically designed to improve the levels and ability to use new technologies, but also to encourage a positive relationship with ICT in typical and special education. Of course, the training must take place under certain conditions. A basic condition is that the training should be understood as a continuous and repetitive process, systematically organized, which aims to support the professional and individual development of teachers. Also, before the implementation of the training programs, the needs of teachers and the educational system must be checked. In addition, the programs should be decentralized and have consistency and continuity as well as systematic way in their planning and should take into account the international and Greek experiences in distance education. Finally, each individual training program must be evaluated (Hatzipanagiotou, 1999). Only when these conditions are met, teachers are informed about the introduction of innovative programs or reform efforts in the educational process, thus mitigating their reaction and resistance to the attempted changes (Mavrogiorgos, 2001). This of course means that there should be a reshaping of teachers' attitudes, beliefs and practices (Konidari, 2005). The information can be done with the timely notification of the programs to all involved, by the competent implementing bodies, through the information and support structures of the programs (e.g. publication of Announcements in Information and Cooperation Portals, Procedures and management guides, etc. a.). With the information, the teachers gain total supervision of the training programs that exist and through their participation in these programs they learn to use effectively the possibilities provided by ICT in the educational process.

Different types of training

In Greece, the three most popular training programs in the field of education are B2 Level, B1 Level, and ECDL Specifically, educators in both mainstream and special education in Greece hold one or a combination of these three certifications. A description of these three training programs it follows:

B1 Level Training

B1 Level Training is an introductory program tailored for primary and secondary education teachers, aimed at enhancing their utilization of ICT in the classroom. The training encompasses:

- Introduction to digital infrastructures provided by the Ministry of Education, including educational platforms, digital repositories, and interactive teaching systems.
- Familiarization with contemporary general-purpose tools and the internet, with a focus on internet safety.
- Objectives include effective utilization of educational platforms and repositories, understanding functions of support environments, proficiency in interactive teaching methods, and awareness of internet safety.
- Participants will gain knowledge of basic teaching principles with ICT integration.

Source: https://e-pimorfosi.cti.gr/plirofories/gia-to-b1

B2 Level Training

The B2 Level ICT training builds upon the foundational B1 Level training, aiming to empower educators with advanced skills in utilizing ICT for teaching across primary and secondary education. Participants must have successfully completed the B1 Level training to qualify for this program.Objectives include:

- Enhancing educators' proficiency in using web 2.0 environments and Ministry of Education-provided digital resources.
- Equipping educators with the ability to design and implement educational activities tailored to their specialty, considering pedagogical effectiveness.
- Familiarizing educators with digital systems pertinent to their field, fostering adaptability to technological advancements.

Specific objectives of the B2 Level training are to:

- Integrate web 2.0 and Ministry-provided resources critically into daily teaching practices.
- Design educational activities independently, aligning with teaching objectives.
- Utilize relevant software and environments effectively, recognizing their potential and limitations.
- Adapt classroom settings to modern pedagogical needs, integrating digital technologies seamlessly.
- Develop a comprehensive understanding of digital technologies in education, placing them within a broader pedagogical context.

Source: https://e-pimorfosi.cti.gr/plirofories/gia-to-b2

Both training programs are related to ICT; however, they exhibit distinct differences. B1 Level training primarily focuses on a theoretical approach to the subjects, while B2 Level training includes "application in the classroom. That’s why teachers are not only expected to understand the theoretical framework but also to utilize the knowledge acquired during their teaching. This is a relatively recent initiative by the Greek Ministry of Education to train educators in ICT, and gradually, teachers from special education of education are included.

In Greece, there is a lot of a discussion and divergent opinions regarding the utility and effectiveness of these two training programs. One program has a purely theoretical approach, while the other has a practical approach, requiring educators to implement new knowledge within their classrooms. Due to these reasons, there is a significant interest in exploring the extent of ICT integration among participants in the research, who have participated in different types of training. The aim is to draw conclusions about whether these training programs are effective and to investigate if there are qualitative and quantitative differences according the results they bring to the educators.

ECDL

The European Computer Driving License (ECDL) or International Computer Driving License (ICDL) offers a comprehensive certification program to enhance digital literacy and computer skills. It comprises modules covering foundational IT concepts, computer use and file management, word processing, spreadsheets, database software, presentations, and online essentials. Completion of these modules leads to the award of the ECDL certification, equipping individuals with essential skills for navigating the digital landscape effectively.

Contemporary barriers and attitudes towards Integration of Information and Communication Technologies in special education

Research has shown that in both Primary and Secondary Special Education, teachers recognize the great usefulness of ICT in teaching practice and are positive towards education. However, they are critical and wary of the systematic use of ICT in teaching (Bosniadou, 2001). Grammenos et al., 2002; Jimoyiannis, 2008) and are very slow in adapting to the use of ICT in the classroom (Jimoyiannis&Komis, 2006; Russel et al., 2003; Tsiatsios et al. 2021). Although there has been an increase in computer access to schools, in most cases teachers continue to use ICT in a classical way and not as cognitive tools (Mikropoulos, 2006), mainly for low-level formal academic goals, such as obtaining information from the Internet or for administrative reasons, to make lesson plans, or competitions, rather than as a learning tool that supports active student learning (OFSTED, 2004; Russell et al., 2003). According to Jimoyiannis&Komis (2007) their obstacle is their limited skills, lack of experience and teachers' attitudes towards ICT.

This attitude of teachers was originally called "computerophobia". Later this concept became more general because it was not limited to the computer but also to every new form of technology that invaded the school and was called "technophobia". Today the term has been replaced by "cyberphobia". Authors use the term "technophobia" more often. Khan (2021), talks about fear and anxiety towards ICT.It is a fact that spatial changes have taken place and schools have been adequately equipped with computers but there is technophobia and anxiety on the part of teachers in any innovation that in their opinion disrupts the traditional and stable structures of teaching (Konidari, 2005). Technophobia according to research (Panagiotakopoulos et

al., 2011; Jimoyiannis, 2008), may be due to internal and external factors. Internal factors are personal characteristics, self-sufficiency, feelings, the degree of familiarity of teachers with ICT, the degree of acceptance by ICT teachers as tools to support the educational and learning process and the readiness of teachers to participate in implementation and integration processes of ICT in teaching practice (Tzimogiannis, 2002). The external factors are sociological, technological, and institutional and school administrative ones (Yadav, 2021).

Internal barriers

Personal factors are closely related to the behavior and negative emotional reaction of individuals as well as the stress that each person has when they have to use computers. So it can take the form of denial of use or fear of spoiling something because he does not know how to use the computer, or of feeling threatened and enslaved to technology (Jimoyiannis&Komis, 2004). According to Rosen (1995) teachers due to reduced computer knowledge are particularly anxious about their use. There is of course the category of teachers who while knowing the use of computers still experience stress and stress when they have to use them, due to lack of confidence in personal technological knowledge and skills (Rosen & Weil, 1995; Dreamson, 2021).

The internal factors that influence teachers 'attitude towards ICT are closely related to individuals' receptivity to experience. According to Jarvis (2009) each person interprets social reality based on all his learning experiences. Thus, when teachers are accustomed to a particular way of teaching and the educational methodology proposed through training and education programs is different from what they are accustomed to, as is the case with distance education methodology or when new technologies are used, such as virtual learning environments and new ICT, then the experience of teachers prevents the application of innovative learning ways and methods in school (Tsiatsios et al. 2022).There are of course teachers who enjoy the use of new technologies for their own pleasure but also in the workplace. They are the ones who see the use of computers from a rational point of view (where the acceptance of ICT is an individual matter of the teacher, who through personal research processes seeks, self-forms, practices and finally applies ICT in the classroom (Jimoyiannis, 2008; Yavad et al., 2021).

Computer self-sufficiency affects people's expectations of computer use (Compeau et al., 1999). Bandura 1986 described self-sufficiency as the result of a cognitive process in which individuals form perceptions about their ability to activate their motivations and cognitive resources in order to be able to respond to certain situations(Lesmerises, 2021).Thus the term self-sufficiency was linked to individuals' beliefs about their ability to use computers. Research shows that self-sufficiency in computer use plays an important role in the development of computer skills (Gist et al., 1989; Roussos, 2007) and in a person's decision to use computers (Compeau & Higgins, 1995). People who use the computer more often gain more confidence and more skills, which imply a more positive relationship with ICT (Konidari, 2005).

Self-sufficiency therefore refers to teachers' beliefs about what they are capable of doing in the classroom according to their abilities (World Bank 2022).

External barriers

From a sociological point of view, the school is a social institution that reproduces and maintains the existing social system for it and resists any change. Teachers, on the other hand, know that the mere existence of the computer in the classroom cannot change the traditional roles of teachers and students.

But many educators are not free from social stereotypes, perceptions and trends in new technologies (Olson, 1995). Technophobia is perceived as a transformation of work and employment, as a change in relationships between themselves and their students, because they feel inadequate and weak in the use of new technologies against the technological ability of their students(Tsiatsios et al. 2022). They come in contact withi-generation student generation (Rosen, 2011) and here a huge gap is created, with consequent degradation of the role of the teacher in the classroom. This has the effect of creating a social inequality in the school because educational mediation is differentiated or mutated by the disconnection of knowledge from its institution (Bernstein, 2000). In other words, we have the social dimension of the pedagogical relationship between teacher and student. In this regard, the factor that Bertrand (1994) considers important is the loss of teacher control in the networked classroom. Now teachers cease to be the focus of the classroom and lose their power, which they have to share with the computer (Yavad et al, 2021).Thus they begin to be possessed by feelings of inferiority and inadequacy towards their students. Some people end up having a negative attitude towards ICT after seeing computers threatening their professional careers and mythologizing computers by turning them into omnipotent symbols (Dreamson, 2021).

Gender dimension in the use of Information and Communication Technologies

Much research has been done to investigate the gender use of ICT in education. According to Tzimogiannis (2010), some showed that women have more negative perceptions and attitudes (Rosen & Weil, 1995), towards ICT, while in others women were found to have more positive perceptions (Ray, 1999). Other studies have found no gender differences in ICT use (Korukonda, 2005; North & Noyes, 2002; Shapka & Ferrari, 2003), while other reviews / meta-analyzes describe conflicting research findings (Brosnan, 1998; Whitley, 1997). In addition, research has been conducted on the specialty of the teacher and his / her attitude towards ICT, as well as the age of the teacher and the use of ICT. Thus, according to research, educational philologists, theologians, social sciences and physical education are neutral or negative in the integration of ICT in teaching (Jimoyiannis&Komis, 2004).

As for students, awareness of their attitudes towards computers influences their future behavior, as well as their decisions about using computers or choosing their career. At this point we must not forget the role of the family and society in general in shaping the attitudes of individuals (Arnot, 2004).So, different attitudes of people towards computers can be a reflection of different social experiences. In recent

years, more and more students have more experience using computers. The use of information technologies is at very high levels among young people aged 16-24, with even more intense penetration being observed in the subcategory 16-20 years. Even as people get older, their familiarity with new technologies decreases. Almost 2 in 10 people aged 55-64 use the computer and the internet, a very low percentage for productive ages. Also for both men and women, there is a significant increase in computer use in the period 2005-2008. However, despite the largest increase in the index in the female population (100%, compared to 85% in men), women continue to fall behind by about 14 percentage points (37% versus 51%) (Identity of Internet users in Greece).

The role of the school management

School management influences the relationship between new technologies and teachers. Here, the headmaster of the school unit, who is the administrative and educational head, has a prominent role. The School Counselor can also play an important encouraging and motivating role in the application of ICT in school. Every educational plan made at the top of the educational pyramid is transferred to the school, where the management must carry it out. According to research (Dadamogia et al., 2010) school headmasters are positive about the use of ICT and the internet and support the initiatives of their school teachers, but are not completely free of stereotypes, such as that they consider it unnecessary to create a website for their school. The absence or even the partial presence of administrative support in initiatives of the educational staff, in relation to the use of new technologies is an inhibiting factor in the modernization and evolution of the educational system. According to Pigiaki (2006), the headmaster must have a "vision" and activate and support retailers in the use of new technologies.

Inadequate organizational structures of the education system prevent and do not facilitate the use of innovative actions using ICT. Its central character limits teachers' autonomy, imagination, creativity, initiative and experimentation. Therefore, they often apply the proposed teaching methodology and technology in order to get the proposed material out. The bureaucratic organization and mentality of schools (Hargreaves, 1999) is another important cause of teachers' negative relations with ICT because they are empowered by mechanisms from above in order to harmonize their teaching according to its requirements. One of the most important problems is the "struggle" to cover the subject matter of the Panhellenic exams, which does not encourage innovation and limits the flexibility of the teacher (Vrasidas, 2010).

Curricula do not allow the use of ICT because they are not structured according to the principles of social interaction and the co-construction of knowledge. It is therefore necessary to restructure the curricula in order to make effective use of ICT. Practical issues such as closed laboratories opened only by computer science teachers, laboratories available to teachers if they have an AD level certification, non-functionality of laboratory spaces which are usually located away from other classrooms, self-maintained laboratories and Their lack of equipment are also some of

the problems that make it difficult for teachers to use them. Teachers feel the need for reliable technical support when problems arise in the use of machines (Jimoyiannis, 2008). According to Karasavvidis and Kollias (2012) ICT was integrated regionally into the existing educational practice and not at its core, while the added learning value of the integration was limited to the visualization of natural phenomena and natural models. While according to Giavrimis et al. (2010) teachers are motivated and believe in their self-efficacy, however, due to the content of the training or the structural problems of education, they find it difficult to apply ICT in practice. The educational project of exploring the training needs of teachers is also emerging, as well as the construction of a functional framework of training programs, which will be in line with the new cognitive tools and teaching practice in the post-modern era (Tsiatsios et al. 2022).

The civil service culture of some teachers and the fatalism, have as a result to leave the teachers away from the developments that take place in the field of technology (Vryonidis, 2007). This of course happens because they are comfortable in the public sphere and do not have the will or motivation to take on more responsibilities, responsibilities and obligations. Dealing with ICT requires more preparation in time and effort, both in terms of curriculum and how to handle supervisory tools and the computer. So they do not decide to proceed with new teaching practices, which open up through new technologies and remain in the traditional way, the teacher-centered, away from the use of ICT. A study by Joakim Samuelsson (2006), which involved Swedish mathematics teachers, showed that when teachers move to experiential learning through multimedia tools, which enliven the classroom and do not remain in the old and obsolete ways of transmitting it, then students find learning more attractive(Dreamson, 2021).

In recent years, remarkable educational software and digital tools have been developed and are constantly evolving, many of which are installed on school computers. A huge variety of software is available for free on the internet. This is a treasure trove of programs that have not been used because teachers do not know how to use it (Yavad et al,. 2021).According to a pan-European survey conducted in schools on the introduction of ICT in education, it shows that teachers are familiar with ICT teaching and learning, but continue to use it primarily to prepare their teaching (European Schoolnet& University of Liège, 2013). Teachers also focus mainly on how they will use digital tools and not on why and how they will use these tools to enhance learning. This research shows that in Greece there are 16 students per computer, above the EU average which is 7 students per computer. Most students per PC are in Turkey (20) while the fewest in Denmark with 3 students per computer. Computers in Greece are about 70% in the laboratory, 15% in the classroom and the remaining 10% are distributed in libraries or other places. The European average is 58% in the laboratory, about 30% in the classrooms and 7% in libraries. Access to interactive whiteboards is extremely low in Greece, with 1 interactive whiteboard per 500 students, far from the EU average with 1 interactive whiteboard per 111 students. Malta holds the first place with an interactive whiteboard for just 18 students. At the teacher level, 43% of Greek teachers use at least 25% ICT in education, 14 percentage

points higher than the European average. At the same time, 64% use school computers (desktop, laptop) for educational purposes in Greek schools.

The role of the school management in special education: Challenges and effective strategies

Special education is a field of education that caters to the diverse needs of students with various disabilities. It encompasses a wide range of instructional strategies, educational programs, and support services that are designed to help students with SEN succeed academically, socially, and emotionally. School management plays a crucial role in ensuring that special education programs are effective and meet the needs of students with SEN. However, managing special education programs can be challenging due to the complex legal requirements and the diverse needs of students with disabilities. Therefore, it is important for school managers to have a deep understanding of special education policies, effective strategies, and the role of various stakeholders in the special education process. This part of the thesis examines the challenges faced by school management in special education and effective strategies for managing special education programs.

Challenges and Responsibilities

Compliance with Legal Requirements

One of the primary challenges faced by school management in Special Education is compliance with legal requirements. Schools are legally required to provide appropriate services and supports to students with special educational needs under the Individuals with Disabilities Education Act (IDEA). The school management must ensure that all staff members are knowledgeable about these laws and regulations and follow them appropriately (Yell, M. L., 2018).

Identification and Assessment of Students with Special Needs

Another challenge faced by school management is identifying and assessing students with special needs. Schools must identify students who may have disabilities and conduct assessments to determine their eligibility for Special Education services. School management should ensure that these assessments are conducted promptly, accurately, and in compliance with legal requirements (Lloyd, J. W., & Edwards, J. H., 2019).

Design and Implementation of Individualized Education Programs (IEPs)

Once a student has been identified as having special educational needs, schools must develop an IEP that outlines the student's individual needs and the services and supports that will be provided. School management should ensure that IEPs are developed collaboratively with parents, teachers, and support staff, and that they are regularly reviewed and updated as needed (Parette, P., &Hourcade, J. J., 2019).

Monitoring Student Progress

School management must monitor student progress and use this data to inform instructional practices and make adjustments to their programs as needed. They should ensure that regular progress monitoring is conducted for all students with disabilities and that the results are used to modify instruction and support strategies (Şen, N., 2017).

Providing Ongoing Support and Feedback to Teachers and Support Staff

School management is essential to provide ongoing support and feedback to teachers and support staff to ensure they are able to effectively implement Special Education programs and strategies. This support should include regular observations and ongoing feedback on their implementation of IEPs and other strategies for supporting students with special needs (Arar, K., & Poth, C., 2018).

Leveraging Technology to Support Special Education

School management is very important to leverage ICT to support Special Education programs and strategies. This approach could include the use of online tools and resources to provide students with access to additional learning materials or to facilitate communication and collaboration among teachers, parents, and support staff (Kauffman, J. M., 2015).

Engaging in Ongoing Research and Evaluation

School management must engage in ongoing research and evaluation to identify evidence-based practices and strategies for supporting students with special needs. This condition could involve partnering with local universities or research organizations to conduct studies on the effectiveness of their Special Education programs and make adjustments based on the results (O'Brien, M. U., & Morrissey, M. T., 2016).

Creating a Culture of Inclusion

School management should create a culture of inclusion and respect that supports the learning needs of all students, including those with special needs. This should involve promoting inclusive practices such as providing opportunities for students with and without disabilities to work together on projects and activities, or by celebrating the unique abilities and contributions of all students (Yell, M. L., 2018).

Providing Resources and Support to Families

School management must provide resources and support to families of students with special educational needs to help them navigate the Special Education process and support their child's learning at home. This challenge could involve providing workshops and training sessions to parents on how to support their child's learning and advocate for their needs (Şen, N., 2017).

Collaborating with Community Partners

School management should collaborate with community partners, such as local government agencies, non-profit organizations, and businesses, to support Special Education programs and services (Alqurashi, E., 2016).

Effective Strategies

Providing an inclusive and supportive learning environment for students with special needs is an essential responsibility of school management. Students with special needs may face unique challenges in their learning process and require individualized support to achieve their full potential. School management must take a comprehensive and multifaceted approach to meet the diverse needs of these students (O'Brien, M. U., & Morrissey, M. T., 2016).

One key strategy for effectively supporting students with special needs is to provide ongoing and comprehensive training for all staff members, including teachers, paraprofessionals, administrators, and other support staff. This training should cover a range of topics, including special education laws and regulations, assessment and evaluation techniques, evidence-based instructional strategies, and behavior management techniques. By providing ongoing training, school management can ensure that all staff members have the knowledge and skills necessary to effectively support students with special needs (Alqurashi, E., 2016).

In addition to training, using data to inform decision making is critical for supporting students with special needs. This includes collecting and analyzing data on student progress, teacher and staff performance, and program effectiveness. By using data, school management can identify areas for improvement and make data-driven decisions about the best ways to support students with special needs. Data can also be used to identify students who may be at risk of falling behind or who may need additional support, allowing school management to intervene early and prevent academic or behavioral problems from escalating (Bunch, G. C., & Valeo, A., 2018).

Fostering collaboration among teachers, support staff, and parents is also crucial to support students with special needs. Collaboration can take many forms, including regular team meetings, parent-teacher conferences, and student support team meetings. Creating opportunities for collaboration ensures that all stakeholders are working together to support the needs of each student. Collaboration can also help to identify and address any issues that may arise during the implementation of Special Education programs and strategies (Şen, N., 2017).

A very important fact is that utilizing ICT to support Special Education programs and strategies can be highly beneficial. This may include the use of assistive technology such as speech-to-text software or text-to-speech software to support students with disabilities. Technology can also be used to enhance communication and collaboration among staff members and with parents (Lloyd, J. W., & Edwards, J. H., 2019).

Moreover, providing regular feedback and support to teachers and support staff is another important strategy. School management should ensure that staff members are effectively implementing Special Education programs and strategies by providing regular observations and feedback on their implementation of IEPs and other strategies for supporting students with special needs. This strategy promotes continuous improvement and ensures that students receive the support they need to succeed (Parette, P., &Hourcade, J. J., 2019).

Additionally, promoting inclusive practices that support the learning needs of all students, including those with special needs is more than essential. This may involve providing opportunities for students with and without disabilities to work together on projects and activities. Inclusive practices promote a sense of belonging and community and can improve the academic and social outcomes of all students (Morrissey, M. T., & O'Brien, M. U., 2018).Furthermore, engaging in ongoing research and evaluation to identify evidence-based practices and strategies for supporting students with special needs is very crucial. School management can partner with local universities or research organizations to conduct studies on the effectiveness of their Special Education programs and make adjustments based on the results. This strategy ensures that resources are allocated effectively and that students receive the support they need to succeed (Kauffman, J. M., 2015).

In addition providing resources and support to families of students with special needs is also very critical. School management should offer workshops and training sessions to parents on how to support their child's learning and advocate for their needs. Supporting families can improve student outcomes and promote a positive school culture (Beattie, M., 2015).Collaborating with community partners, such as local government agencies, non-profit organizations, and businesses, is also important to support Special Education programs and services. This may involve working with local agencies to provide transportation or other necessary services to students with disabilities, or partnering with local businesses to provide vocational training and work opportunities for students with special needs (Arar, K., & Poth, C., 2017).

Finally, promoting a positive school climate that supports the learning and well-being of all students, including those with special needs, is essential. This may involve promoting positive behavior interventions and supports, implementing restorative justice practices, and fostering a sense of belonging and community within the school. A positive school climate can improve academic and social outcomes for all students and promote a culture of acceptance, respect, and inclusivity (Cologon, K., 2016). This is particularly important for students with special needs who may face additional challenges in their academic and social lives. By creating a positive school environment, students with special needs can feel valued and supported, leading to improved academic performance and social skills (Bunch, G. C., & Valeo, A., 2018).

In conclusion, the role of school management in Special Education is critical in ensuring that all students, including those with special needs, receive a high-quality education that meets their individual needs. School management faces numerous

challenges in implementing effective Special Education programs and strategies, including a lack of funding, resources, and support. However, by implementing the effective strategies outlined in this paper, school management can overcome these challenges and support the success of students with special needs.

Providing professional development, using data to inform decision making, fostering collaboration, utilizing technology, providing regular feedback and support, promoting inclusive practices, engaging in research and evaluation, providing family support, collaborating with community partners, and promoting a positive school climate are all effective strategies that school management can implement to support students with special needs. It is important for school management to prioritize Special Education and ensure that all students have access to the resources and support they need to succeed. By doing so, schools can create an inclusive and welcoming environment where all students can thrive Arar, K., & Poth, C. (2018). The challenges of Special Education may be significant, but with effective strategies and a commitment to student success, school management can make a positive impact on the lives of students with special needs.

ICT Training and Effective Strategies for School Management to Support Teachers in Special Education

This unit highlights the importance of training teachers in ICT and effective strategies for school management to support teachers in integrating ICT in special education. The use of ICT can improve accessibility, support differentiation in instruction, create inclusive learning environments, save time, personalize learning experiences, facilitate collaboration and communication, and provide valuable data for data-informed decisions. The school management can support the training of teachers in ICT by providing access to relevant technology and resources, ongoing professional development opportunities, creating a supportive environment, providing time and space for experimentation and practice, facilitating peer coaching and mentoring, offering incentives and rewards, providing technical support, engaging parents and caregivers, and fostering partnerships with technology companies and experts. By implementing these strategies, schools can improve their technology integration program and ensure that students with special educational needs have access to the necessary digital literacy skills for success in a digital world.

The integration of ICT in special education has brought about a revolution in the way students with special educational needs learn and interact in the classroom. Training teachers in ICT is essential to ensure that students with disabilities have equal access to education and are equipped with the necessary digital literacy skills to succeed our modern world. In this article, we will explore the importance of training teachers in ICT in special education, and effective strategies that school management can use to support teachers in integrating ICT in their daily teaching strategies and practices.

Teachers' Information and Communication Technologies Training in Special Education

There are several reasons why training teachers inICT is crucial in special education. One of the primary reasons why training teachers in ICT is crucial in special education is accessibility. Communication Technologies can provide various tools and resources that can help students with special educational needs access learning materials and participate in classroom activities. For example, screen readers and text-to-speech software can help students with visual impairments access written content, while speech recognition software can help students with physical disabilities who have difficulty using a keyboard (Wolf, M. A., &Pintrich, P. R., 2018).

In addition to accessibility, the use of ICTcan also support differentiation in instruction. With the use of ICT, teachers can easily differentiate instruction for students with varying abilities and needs. They can use multimedia resources to provide visual and auditory aids, interactive simulations to make abstract concepts more concrete, and digital portfolios to showcase student work and progress (Ofsted., 2016).

Furthermore,ICT can help create inclusive learning environments that meet the diverse needs of all students, regardless of their abilities or disabilities. For example, online discussion forums and collaborative tools can provide opportunities for all students to participate and contribute to classroom activities, regardless of their communication or social skills (Murawski, W. W., & Dieker, L. A., 2018).The use of ICT can also help teachers save time and improve their efficiency in the classroom. For example various Digital platforms can streamline administrative tasks such as grading and attendance tracking, while online resources can provide teachers with instant access to a wealth of educational materials and professional development opportunities (Phillips, M., & Timmermans, J., 2019).

ICT can also be used to personalize learning experiences for students with special educational needs, taking into account their unique learning styles and needs. Adaptive learning software can adjust the difficulty level and pacing of instruction based on a student's performance, while online assessments can provide immediate feedback and help teachers adjust instruction accordingly (Balandin, S., & Llewellyn, G., 2018).For some students with special educational needs, traditional classroom activities may not be engaging or motivating. The use ofICT can help to make learning more interactive, interesting, and enjoyable. Game-based learning can provide a fun and engaging way for students to practice skills and concepts, while virtual reality and simulations can create immersive learning experiences (Wilson, S. M., & Berne, J., 2017).

ICT can also facilitate collaboration and communication between teachers, students, and the general school society. Teachers can use digital ICT in order to share resources and collaborate on lesson planning, while online communication tools can provide a way for families to stay connected with their child's education and

progress in their school life (McLeod, S., & Richardson, J. W., 2018).Training teachers inICT can also help to improve their professional development and increase their effectiveness in the classroom. By staying up-to-date with the latest technologies and instructional strategies, teachers can improve their teaching practices and provide better support for students with special educational needs (Darling-Hammond, L., Hyler, M. E., & Gardner, M., 2017).

Moreover, the use of ICT in special education can provide valuable data and insights into student performance, which can help teachers to make data-informed decisions about instruction and interventions. Data from online assessments and digital learning platforms can be used to identify areas where students may need additional support or challenge (Hu, B. Y., Li, Y., & Guo, J., 2018).

Finally, as technology continues to play an increasingly important role in the workplace and in daily life, it is crucial that students with special educational needs have the opportunity to develop the necessary digital literacy skills. By training teachers in ICT, we can help to the approach of ensuring that students with disabilities are equipped with the skills and knowledge they need to succeed in a digital world (Krenn, H. Y., & Maier, J. M., 2018).

Effective Strategies provided by School Management

In order to support the training of teachers in ICT in special education, the school management can take various measures. First of all, providing access to relevant technology and resources such as computers, tablets, necessary software, and internet connectivity can help teachers familiarize themselves with the latest technology and tools in special education and effectively integrate them into their teaching practices (Kelley, T. R., & Knowles, J. G., 2016).

In addition, the ongoing professional development opportunities can be provided for teachers in ICT in special education through workshops, seminars, online courses, and other various training programs. This approach will help teachers develop the necessary skills and knowledge to effectively use technology in special education, as well as stay up-to-date with the latest trends and advancements (Darling-Hammond, L., Hyler, M. E., & Gardner, M., 2017).

Moreover, creating a supportive environment for teachers inICT in special education is crucial. Encouraging and supporting innovative teaching practices, providing opportunities for collaboration and networking, and recognizing and rewarding teachers who excel in integrating technology in special education can help teachers feel valued, motivated, and empowered to use technology in their teaching strategies and practices (Day, C., 2018).

Additionally, providing time and space for experimentation and practice can support the training of teachers in ICT in special education. This can be done by allocating time during the school day or providing access to technology outside of regular class hours (Wolf, M. A., &Pintrich, P. R., 2018).Furthermore, peer coaching

and mentoring among teachers in ICT in special education can be facilitated by pairing experienced teachers with those who are new to technology integration, providing opportunities for peer observation and feedback, and encouraging teachers to share their successes and challenges with each other (Bektik, E., 2017).

Also, offering incentives and rewards to teachers who successfully integrate technology in special education is also important. Recognizing and rewarding teachers who demonstrate excellence in technology integration, providing financial incentives or other benefits for those who participate in training programs, or offering opportunities for professional advancement for those who excel in this area can motivate and encourage teachers to continue using ICT in their teaching practices (Wilson, S. M., & Berne, J., 2017).

Providing technical support for teachers in ICT in special education is also essential. Having a dedicated IT team to assist teachers with technical issues or providing resources such as user manuals, online tutorials, and troubleshooting guides can help teachers overcome any challenges they may face while integrating technology in their teaching approaches (Balandin, S., & Llewellyn, G., 2018).In addition engaging parents and caregivers in the use of technology in special education is very important. Providing them with information and resources on how technology and ICT can support their children's learning through workshops, parent-teacher conferences, and other communication channels can help parents and caregivers understand the benefits of technology in special education (Bektik, E., 2017).

Moreover, fostering partnerships with technology companies and experts in the field of special education can be valuable. Inviting guest speakers, partnering with technology companies to provide training and resources, and collaborating with researchers and experts to stay up-to-date with the latest developments in technology and ICT in special education can help schools stay current and improve their technology integration program (Murawski, W. W., & Dieker, L. A., 2018).

Finally, conducting regular evaluations of the effectiveness of technology and ICT' integration in special education is crucial. Collecting feedback from teachers, students, and parents, analyzing student performance data, and making necessary adjustments to the technology integration program can help ensure that technology integration is meeting the needs of students with special needs and improving their learning outcomes (Jones, J., & Pauly, T., 2016).

To sum up, the use of ICT in special education is crucial in providing inclusive and accessible learning environments that meet the diverse needs of all students. Training teachers in ICT can provide them with the necessary skills and knowledge to effectively integrate technology into their teaching practices, resulting in personalized learning experiences for students with special educational needs, improved efficiency in the classroom, and better support for students' unique learning styles and needs.

Effective strategies of school management, such as providing access to relevant technology and resources, ongoing professional development opportunities, and technical support, can support the training of teachers in ICT in special education. Creating a supportive environment for teachers in ICT in special education, engaging parents and caregivers, and fostering partnerships with technology companies and experts in the field of special education can also help schools improve their technology integration program. By investing in the training of teachers in ICT and effective strategies of school management, we can ensure that students with special educational needs have the necessary skills and knowledge to improve their school performance and to succeed in their daily routine and lives.

CHAPTER THREE: DESIGN OF THE RESEARCH

3.1. Aim, research questions, hypotheses and objectives

Aim

The main purpose of this research is to investigate the level and manner of ICT integration in Special Education through the perspective of three factors (gender, educational level, and training) and whether students benefit from their use in the Greek primary and secondary schools. Simultaneously, are examined the role of school administration, the perceptions of teachers, and the contemporary barriers regarding the integration of ICT in their teaching.

Research Questions

1. What is the Information and Communication Technologies level in special education?
2. How the factors of “gender”, “school level” and “training” correlate with the Information and Communication Technologies level in special education?
3. Which are the main factors and barriers that discourage the use of Information and Communication Technologies in special school units?
4. Which are the perceptions and attitudes towards Information and Communication Technologies in special education?
5. What is the role of school management towards the integration of Information and Communication Technologies in special schools?
6. Does the use of Information and Communication Technologiesimproves the school performance of students with special education needs?

Hypotheses and Objectives

This dissertation includes two hypotheses. More specifically the first one is that teachers have a positive attitude towards ICT but they don’t use them. Thus it is assumed the contradictory fact that even if the educators in the Greek special schools will show positive attitude towards ICT they do not use them in a satisfactory extend,

both quantitatively and qualitatively in the educational process. In addition an improvement on the school performance is expected through the use of ICT. Students with SEN who use computers & ICT to solve their exercises make fewer mistakes than those who utilize the traditional worksheet.

Regarding to the objectives of the dissertation it will be investigated the level of ICT integration and analyzed the way teachers use them based on the following factors and parameters: a) gender b) school level c) having or not having an ICT certification and d) the kind of ICT certification. In addition will be intresting to report the perceptions of the teachers and the main contemporary barriers that have an impact on the degree of ICT integration. Finally, the role of the head teacher, deputy head teacher and school management and the influence it could have on the integration of ICT in special education, will be analyzed by focusing on the attitudes of all participants considering three important factors. More specifically it will be examined if the school management: a) supports and strengthens teachers' efforts to integrate ICT in their teaching, b) encourages the participation in any ICT training program and c) manages to provide the necessary logistical infrastructure.

Sample

A proper sample of 244 teachers, head teachers and deputy head teachers of primary and secondary Greek special schools was collected in order to answer the research aims. The questionnaires were collected electronically from "Google Forms" between 06-02-2023 and 11-05-2023 and correlate with the first five research questions of the survey.In regard with the sixth one, related to the improvement of the school performance, the sample was 10 students of the "Special Vocational Training Workshops of Piraeus".

Methodology

In order to accomplish the survey was used two different methods. For the investigation of the research and specifically for the first five research questions a quantitative approach was chosen using a structured questionnaire. This choice was duo to the fact that this method is considered suitable for collecting a large number of samples and at the same time obtains more reliable results. Before the questionnaire was sent, it was passed successfully from a pilot testing. The questionnaires were collected through the "Google Forms" between 06-02-2023 and 11-05-2023. For the statistic analysis of theresults were implemented descriptive and inductive statistic methods executed by the statistic program SPSS23.0.

For the purpose of examining the differences of the students' performance through the use of Information and Communication Technologies, an experimental activity was implemented between 01-05-2023 and 31-05-2023. More specifically, along with this task, it was examined if the students with special educational needs who use computers and ICT (Experimental Group) could solve their exercises with

fewer mistakes than those who utilized the traditional worksheet (Control Group). This practice was previously successfully pilot tested (Pilot Group). It is important to underline that the experimental activity took place in the computing class under the same or equal conditions and circumstances.

Research Tools

The two tools used to achieve the survey were a structured questionnaire and an experimental activity. The questionnaire of the survey has 38 questions in total, some of them with five point Likert format and others with yes/no format. The questionnaire contains five parts and each of them has specific number of questions and serves for different purposes of the research. The first part includes nine (9) questions and is related with the identification of the sample. The second one has seven (7) questions and is about the degree of ICT's integration in teaching. The third one contains eight (8) questions and refers to the reasons and barriers for not using ICT The forth one includes seven (7) questions and is related with the perceptions and attitudes of the participants towards ICT. The fifth and last part of it has seven (7) questions about the role of the school management in regard to the integration of the ICT.

In regard to the experimental activity, observation, recording and analysis were key elements for the successful accomplishment of this practice. The project took place in the laboratory of "Special Vocational Training Workshops of Piraeus" with the proper computing equipments and internet access. The participants were 10 students with SEN.The activity included ten "True/False" format questions and another ten with the "multiple choices" method.They were all students of the fifth class of the "Special Vocational Training Workshopof Piraeus and the experimental activity took place during the computing class. The application used was "Kahoot". This app is a dynamic and interactive game-based learning platform designed to revolutionize traditional educational approaches. It has gained widespread popularity for its ability to engage students through playing, making learning more enjoyable and effective.

"Kahoot" allows creating, customizing, and sharing quizzes, surveys, and discussions, transforming content into interactive games. In this experimental activity, one Multiple Choice and two True/False quizzes were designed and implemented. The platform is web-based and accessible across various devices, promoting flexibility and inclusivity in the learning experience. Through its user-friendly interface, teachers can effortlessly design quizzes tailored to specific topics, aligning with the diverse needs of their students. "Kahoot" was chosen as the proper app for its capacity to offer personalized, interactive and multisensory learning, engagement, motivation mechanics, inclusivity, instant insight and immediate feedback.

Reliability and Validity

Quantitative research and experimental process measurement methods were used in the survey. A structured questionnaire and an experimental activity were the two tools implemented to achieve a reliable and valid result. The reliability and validity of the questionnairewere confirmedby the Cronbach's Alpha analysis that showed the rate of “Cronbach's Alpha 950.22”. In regard to the consistency and accuracyof the experimental activity, they were assured by providing the students with special education needs the same or equal conditions and circumstances during the whole project.

CHAPTER FOUR: ANALYSIS OF THE RESULTS

For the statistic analysis of the results were implemented descriptive and inductive statistic methods executed by the statistic program SPSS23.0.

Integration of ICT

This part of the PhD thesis presents the results on the degree of integration of Information and ICTin Greek special primary and secondary schools.

Table 12 is about the use of Office applications during the teaching practice. More specifically, 2% (5 participants) stated that they never use office applications in their teaching, 7.4% (18 participants) use them rarely, 20.5% (50 participants) use them occasionally, 45.9% (112 participants) use them often and the remaining 24.2% (59 participants) always use office applications during their teaching practice. The Mean of this question is 3.8279 and its Mode is 4.00.

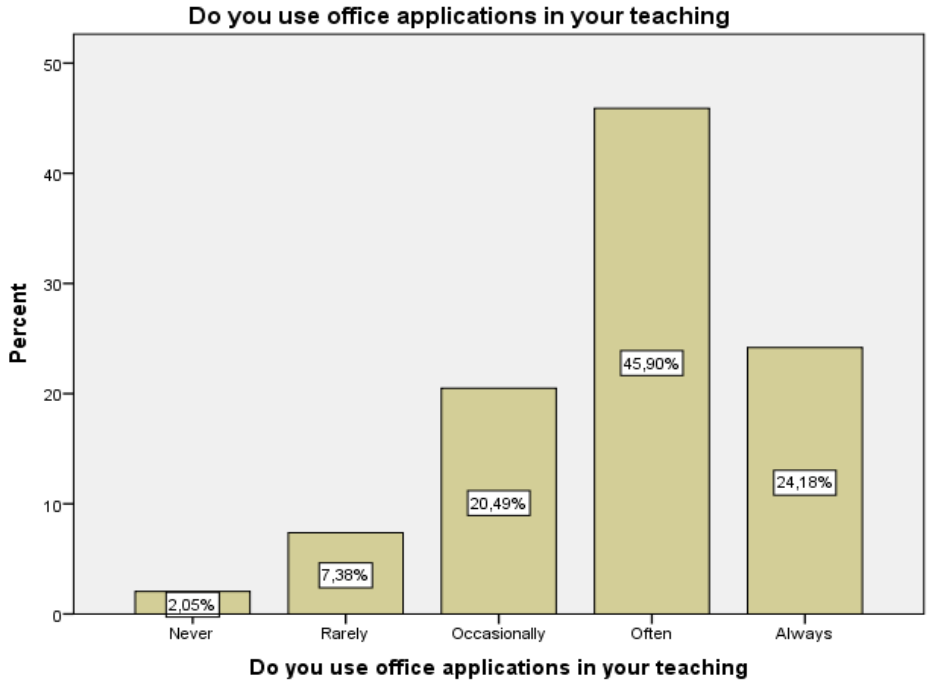


Table 14 examines whether survey participants use a projector to present their course. 2% (5 participants) stated that they never use a projector to present their lesson, 6.1% (15 participants) use it rarely, 22.1% (54 participants) use it occasionally, 45.5% (111 participants) use it often and the remaining 24.2% (59 participants) always use a projector during their lesson. The Mean of this question is 3.8361 and its Mode is 4.00.

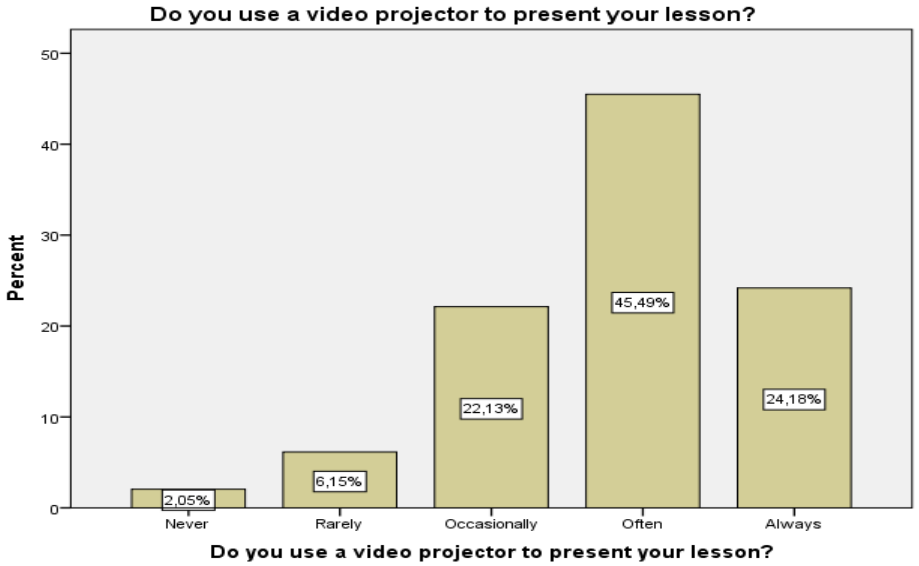


Table 13 relates to whether the survey participants implement educational activities/scenarios using ICT in their teaching. 12.3% (30 participants) seem to never apply educational activities/scenarios in their teaching practice, 11.5% (28 participants) rarely apply them, 37.3% (91 participants) apply them occasionally, 16% (39 participants) apply them often and finally the remaining 23% (56 participants) always apply educational activities/scenarios using ICT in their teaching. The Mean here is 3.2582 and its Mode is 3.00.

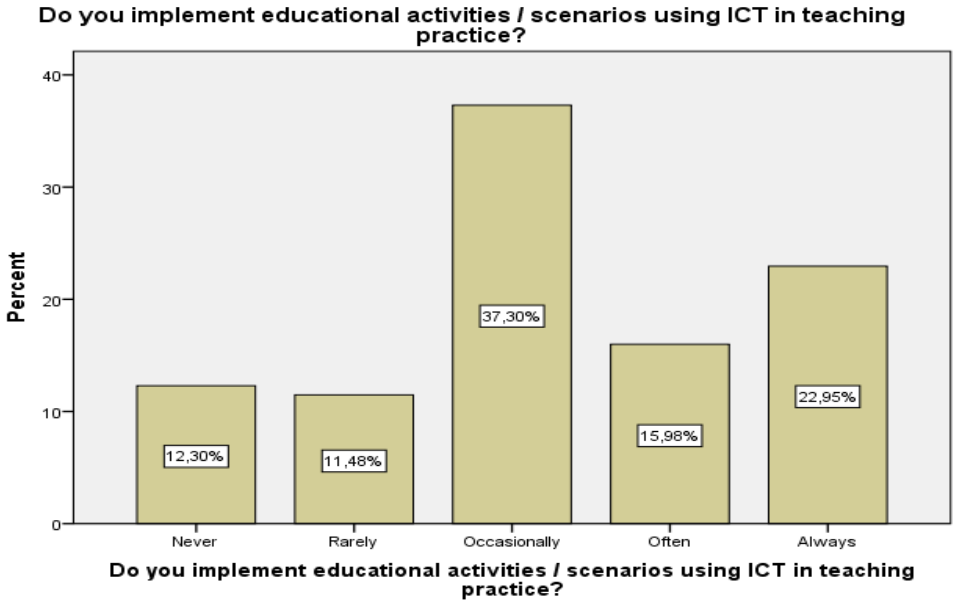


Table 15 refers to the use of Web2 applications and services by the research participants during their teaching. 12.7% (31 participants) never use Web2 applications and services in their teaching, 11.9% (29 participants) use them rarely, 37.7% (92 participants) use them occasionally, 15.6% (38 participants) use them often, and the remaining 22.1% (54 participants) always use Web2 applications and services in their teaching practice. The Mean here is 3.2254 and its Mode is 3.00.

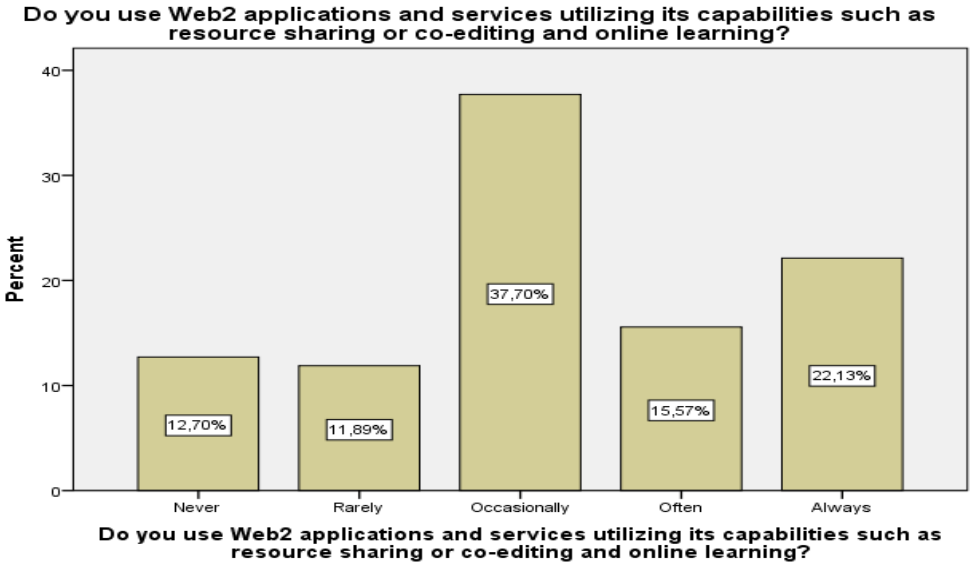


Table 17: Aggregated Mean and Mode Statistics

	Table 10	Table 11	Table 12	Table 13	Table 14	Table 15	Table 16
N Valid	244	244	244	244	244	244	244
Missing	0	0	0	0	0	0	0
Mean	3,2664	3,3238	3,8279	3,2582	3,8361	3,2254	3,3279
Mode	3,00	3,00	4,00	3,00	4,00	3,00	4,00

Barriers for not using ICT

This section of the PhD thesis presents the results of the survey concerning the factors, barriers and constraints that may make the survey participants reluctant to integrate ICTin their teaching practice.

Table 22 investigates whether the personal lack of knowledge and skills of the survey participants affects the integration of Information and ICT in teaching. 4.1% (10 participants) believe that the personal lack of knowledge and skills of survey participants does not affect at all the integration of ICT in teaching practice, 9.4% (23 participants) believe that it is slightly affected, 20.5% (50 participants) believe that it is affected a little, 39.3% (96 participants) believe that it is very affected and 26.6% (65 participants) believe that the personal lack of knowledge and skills of the research

participants affects very much the integration of ICT in teaching. The Mean here is 3.7500 and its Mode is 4.00.

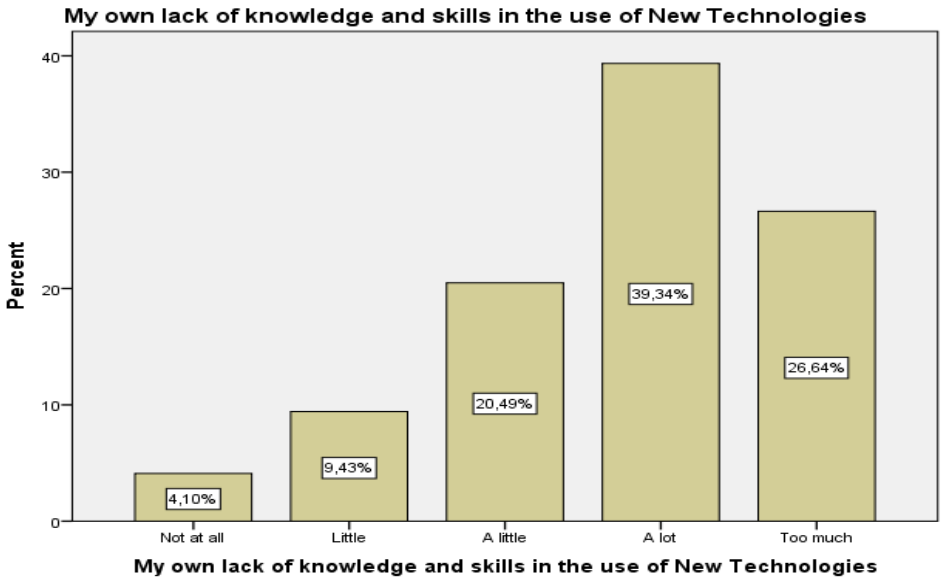
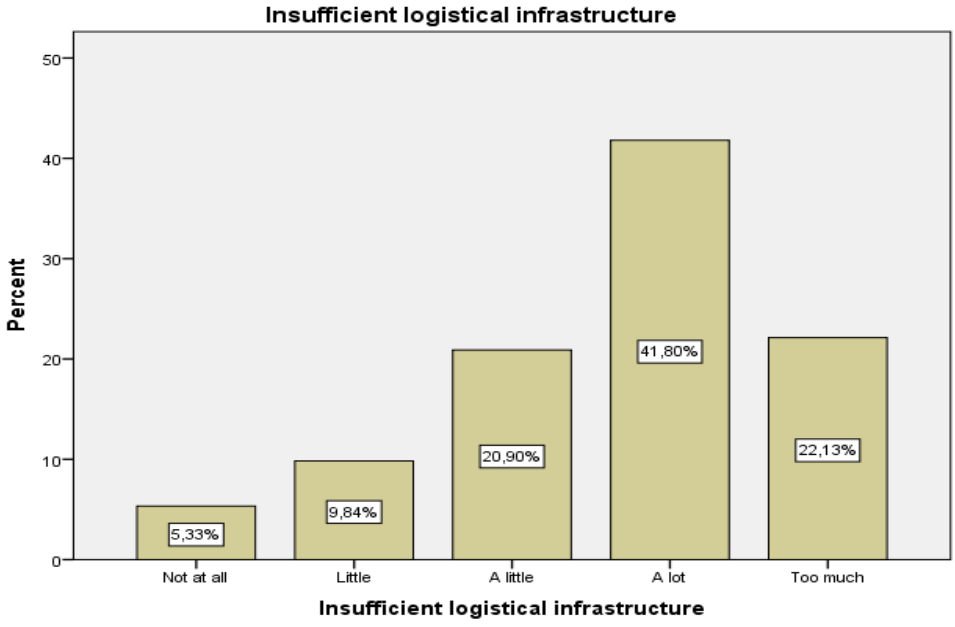


Table 17 has to do with whether the factor of insufficient logistical infrastructure affects the integration of ICT in teaching. The survey revealed that 5.3% (13 participants) consider that insufficient logistical infrastructure does not affect the integration of ICT at all in teaching practice, 9.8% (24 participants) consider that it is slightly affected, 20.9% (51 participants) consider that it is a little affected, 41.8% (102 participants) consider that it is very affected and the remaining 22.1% (54 participants) consider that the insufficient logistical infrastructure affects very much the integration of ICT in teaching. The Mean of this question is 3.6557 and its Mode is 4.00.



Perceptions and attitudes on ICT

This section presents the results on the perceptions and attitudes of the survey participants regarding the application of ICT in teaching practice.

Table 25 examines whether the participants of this research consider the use of ICT as a good pedagogical practicein their teaching. 2.9% (7 participants) do not consider at all the use of ICT as good pedagogical practice in their teaching, 11.1% (27 participants) consider it slightly as a good pedagogical practice, 13.5% (33 participants) consider it a little bit as a good pedagogical practice, 44.3% (108 participants) consider it as a good pedagogical practice and 28.3% (69 participants) consider it as a very good pedagogical practice to use ICT in their teaching. The Mean of this question is 3.8402 and its Mode is 4.00.

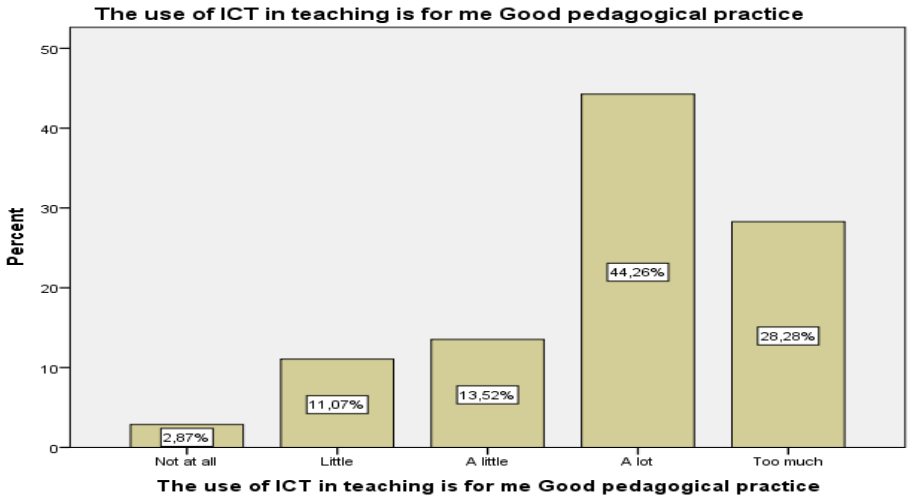


Table 26 investigates whether the survey participants find useful to use ICT in their teaching. 2.9% (7 participants) do not find the use of ICT useful at allin their teaching, 10.7% (26 participants) find it a slightly useful, 15.2% (37 participants) find it a little useful, 46.3% (113 participants) find it useful and 25% (61 participants) find it very useful to use ICT in their teaching. Mean: 3.7992 and Mode: 4.00.

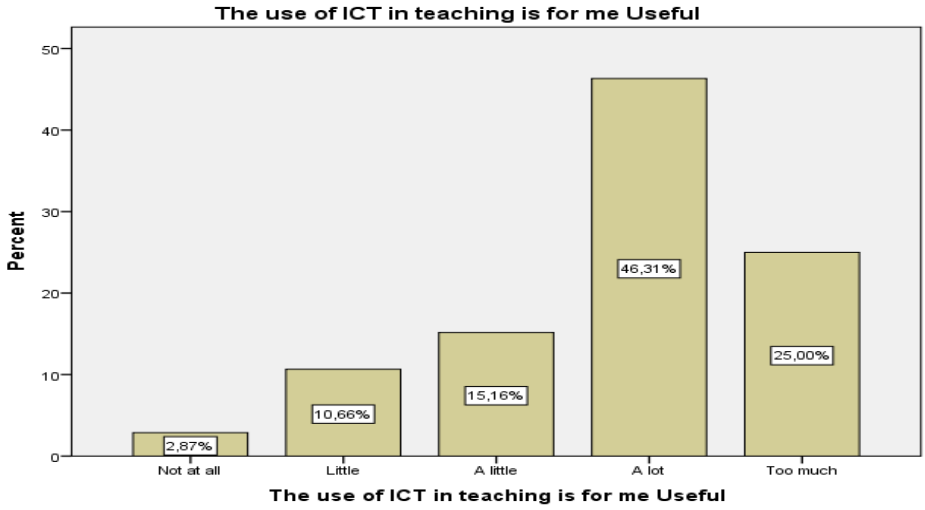
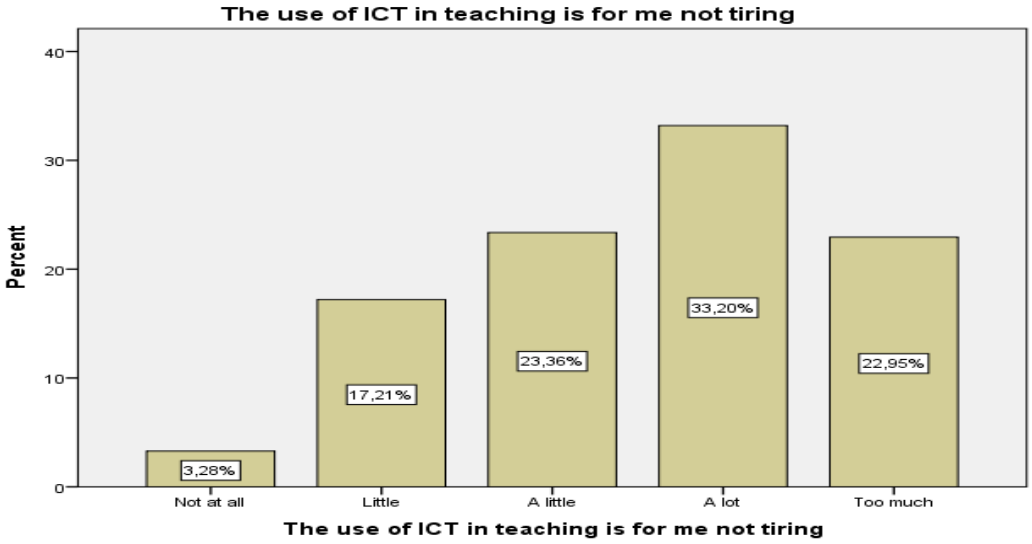


Table 30 examines whether the survey participants consider ICT to be "not-tiring" in their teaching. 3.3% (8 participants) do not consider at all the use of ICT to be "not tiring" in their teaching, 17.2% (42 participants) consider it slightlyas "not tiring", 23.4% (57 participants) consider it a little "not tiring", 33.2% (81 participants) consider it a lot "not tiring" and 23% (56 participants) consider it very "not tiring" to use ICT in their teaching. The Mean here is 3.5533 and its Mode is 4.00.



The role of the school management

In this section of the PhD thesis the results are presented regarding the role of the administration of the Greek special schools of primary or secondary education based onthe integration of ICT in teaching practice.

Table 38: Relating to the question whether the school management of the survey participants' supports and enhances teachers' efforts to incorporate ICT in their daily teaching practice, 74.6% (182 participants) responded affirmatively while the remaining 25.4% (62 participants) responded negatively.

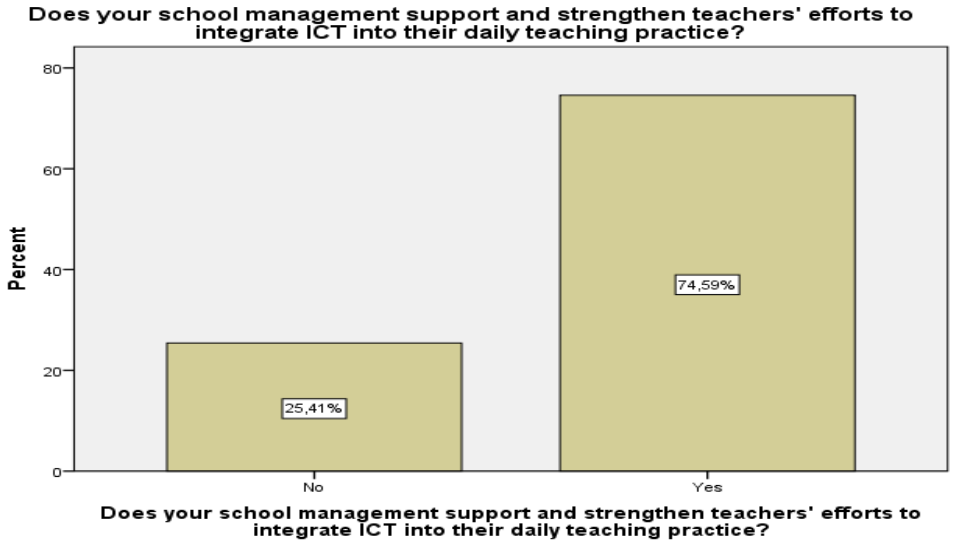
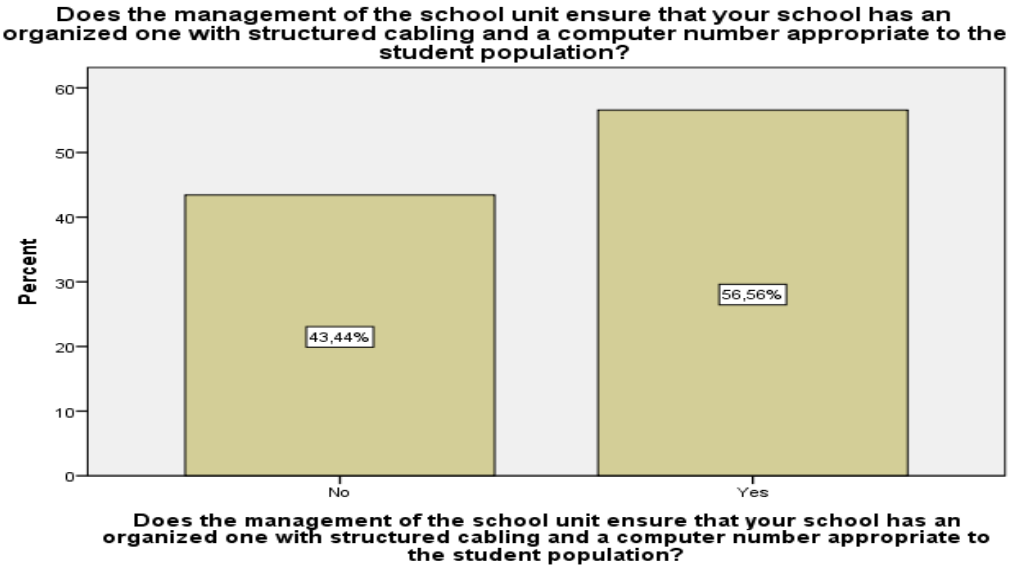


Table 32 refers to whether the management, of the schools of the survey participants, ensures that their schools have the necessary number of computers. The survey shows that 56.6% (138 participants) of the participants believe that the management of their school ensures that the necessary number of computers is available in the schools while 43.4% (106 participants) do not have the same opinion.



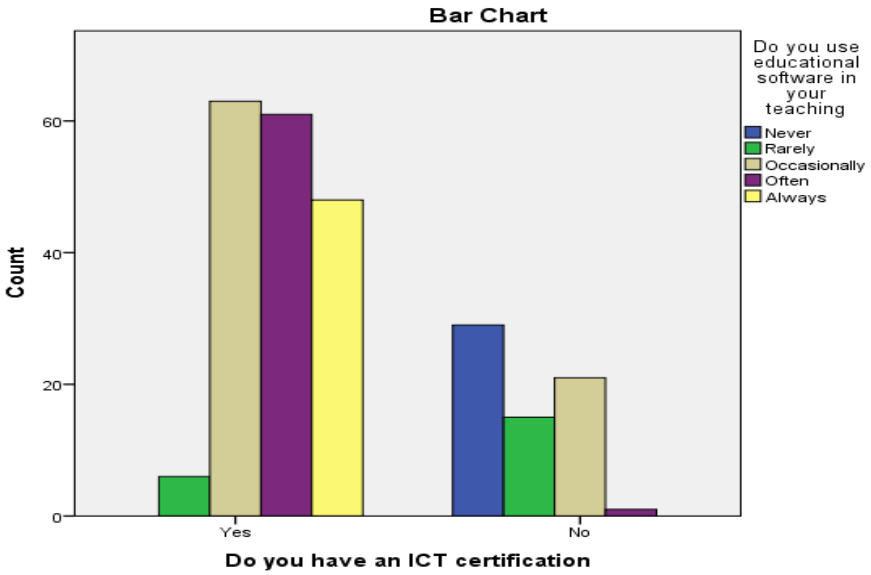
Integration of ICT regarding to the gender and school level and training

This part of the PhD thesis presents the results of the research taking under consideration the factors gender, school level and training of the participants. More specifically, it is investigated whether gender, school level and training influence the degree of integration of ICTin the teaching of the research participants.Gender and school level didn't show significant differences in ICT use. However, certified teachers used ICT more extensively compared to non-certified ones, with higher-level certifications correlating with more frequent and advanced ICT utilization. This highlights that training programs/certifications not only influences the frequency but also the quality of ICT integration in teaching practices.

Differences between participants who have an ICT certification and those who have not

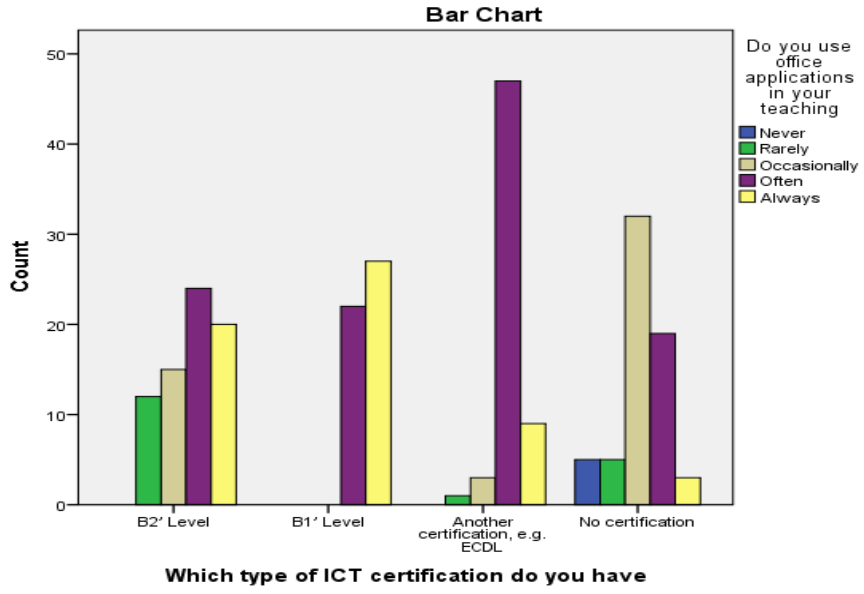
In this instance it is investigated whether the survey participants (depending on whether they have an ICT certification or not) use educational software in their teaching. Regarding the participants who have ICT certification and constitute 73% (178) of the survey sample, 0% (0 participants) never use educational software in their teaching, 2.5% (6 participants) rarely use them, 25.8% (63 participants) use themoccasionally, 25% (61 participants) use them often and the remaining 19.7% (48 participants) always use educational software in their teaching. On the other hand, regarding the participants who do not have ICT certification and constitute 27% (66) of the study sample, 11.9% (29 participants) never use educational software in their teaching, 6.1% (15 participants) use them rarely, 8.6% (21 participants) use them

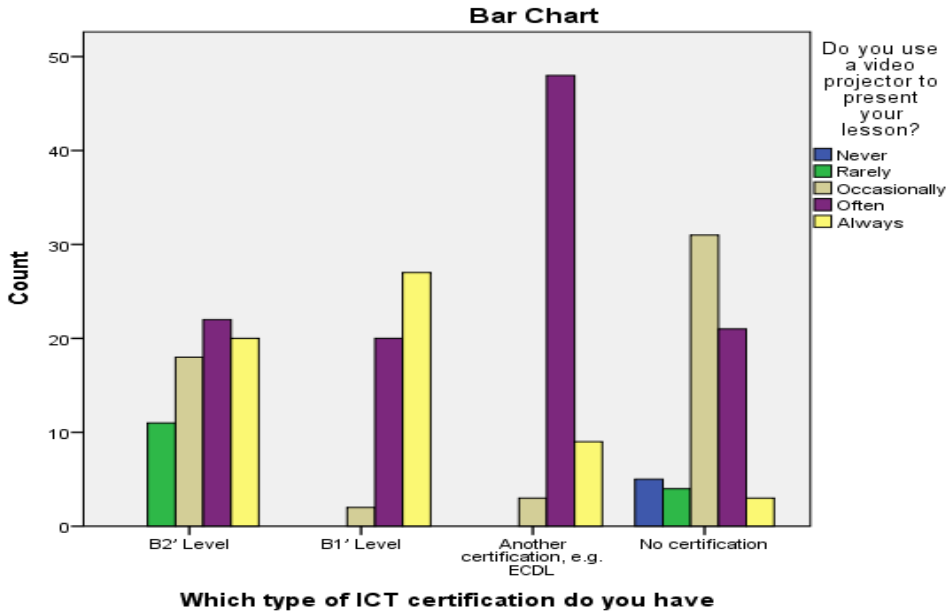
occasionally, 0.4% (1 participant) use them often and the remaining 0% (0 participants) always use educational software in their teaching practice.



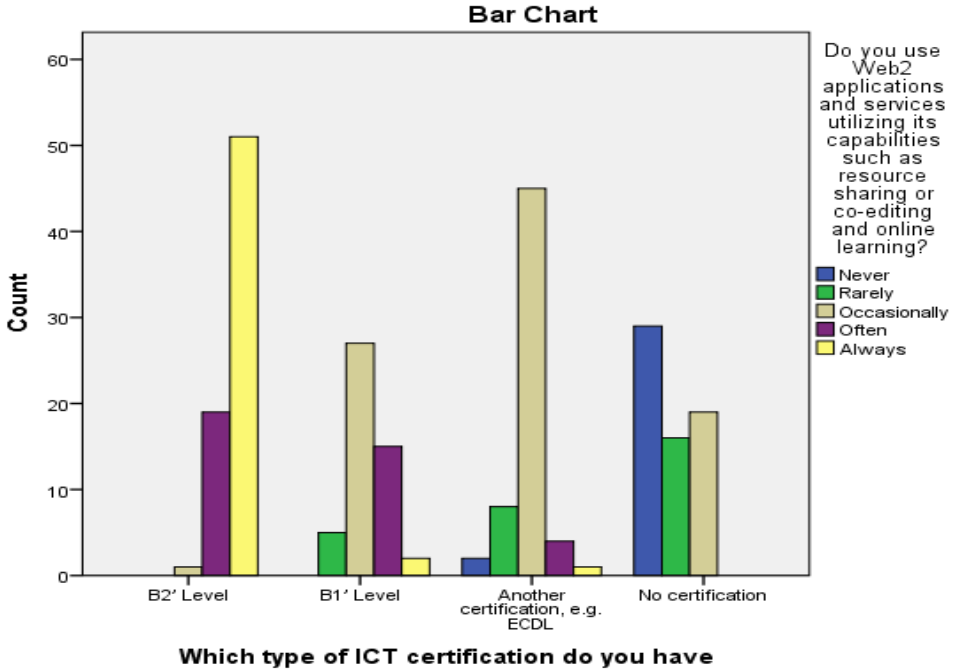
Differences among participants according to the type of their ICT certification

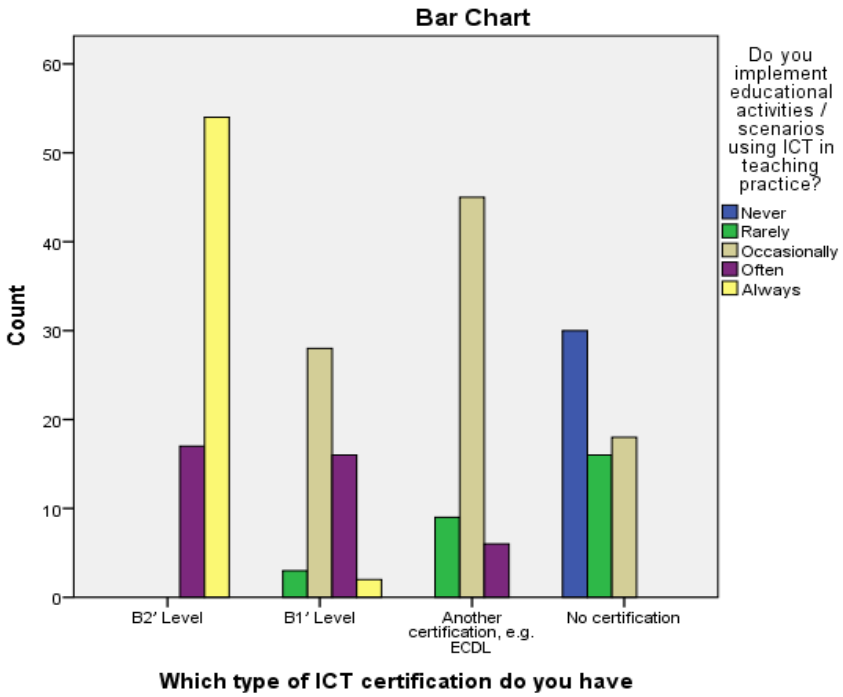
This section of the thesis presents the results of the research by considering the factor of the type of ICT certification that the research participants may or may not have. More specifically, it is investigated whether there are differences among the participants depending on whether they have B2' Level, B1' Level, Another Certification e.g. ECDL or none of them, regarding the degree of integration of ICT in their teaching.It turns out that the teachers who have "ICT B2' Level Certification" use ICT even more often than their colleagues who have only "ICT B1' Level Certification" or ECDL or other similar certification. In addition, teachers who have "ICT B1' Level Certification" or ECDL or other similar certification apply ICT more frequently than those who have not.





These differences are not only related to quantitative data but also to individual qualitative characteristics. A deeper analysis of the statistical data shows that the type of certification not only determines the degree of integration of ICT but also the way that participants use them in the teaching practice. Teachers who have only "ICT Level B1' Certification" or ECDL or other similar certification tend to use mostly medium quality and tools like Office applications and projector for their lesson presentations. On the contrary, the teachers who have "ICT B2' Level Certification" tend to use tools of high quality and effectiveness such as Web2 or other similar applications and services in order to create educational activities and scenarios. Therefore another hypothesis of the survey is confirmed: the degree of ICT integration is quantitative and qualitative influenced by the training.




Bar Chart
Count
60
50
40
30
20
10
0
B2' Level
B1' Level
Another certification, e.g. ECDL
No certification
Which type of ICT certification do you have
Do you implement educational activities / scenarios using ICT in teaching practice?
Never
Rarely
Occasionally
Often
Always

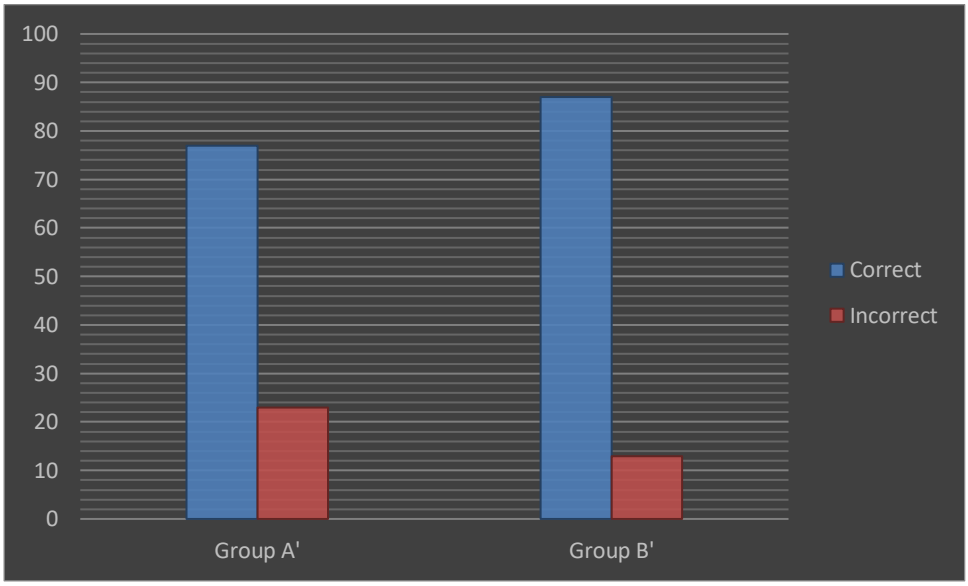
School Performace of Sudents: ICT Vs Worksheets

In this part of the study, it is examinded the results of the experimental activity which took place among ten (10) students with special educational needs. Both, the Control Group and the Experimental Group of the project worked with the same established twenty (20) questions under the same or equal conditions and circumstances.

	GROUP A' - CONTROL GROUP										GROUP B' - EXPIREMENTAL GROUP									
	Student A1		Student A2		Student A3		Student A4		Student A5		Student B1		Student B2		Student B3		Student B4		Student B5	
Correct / Incorrect	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I
Question 1	✔		✔		✔		✔		✔			x	✔		✔		✔		✔	
Question 2	✔			x	✔			x	✔		✔			x	✔		✔		✔	
Question 3		x	✔		✔		✔		✔		✔		✔		✔		✔		✔	x
Question 4	✔		✔			x	✔			x	✔		✔			x	✔		✔	
Question 5	✔		✔		✔		✔		✔		✔		✔		✔		✔		✔	
Question 6	✔		✔			x	✔		✔			x	✔		✔		✔		✔	
Question 7	✔			x	✔		✔			x	✔		✔		✔		✔			x
Question 8		x	✔		✔		✔		✔		✔			x	✔		✔		✔	
Question 9	✔			x	✔			x	✔		✔		✔			x			✔	
Question 10	✔		✔		✔		✔		✔		✔		✔		✔		✔		✔	
Question 11		x	✔		✔			x	✔		✔		✔		✔			x	✔	
Question 12	✔		✔		✔		✔		✔			x	✔		✔		✔		✔	
Question 13	✔		✔		✔		✔			x	✔		✔		✔		✔		✔	
Question 14	✔			x	✔			x	✔		✔			x	✔		✔		✔	
Question 15	✔		✔			x	✔		✔		✔		✔		✔		✔		✔	
Question 16		x	✔		✔		✔		✔		✔		✔		✔		✔		✔	
Question 17	✔		✔		✔		✔			x	✔		✔			x			✔	
Question 18	✔			x	✔		✔		✔		✔		✔		✔		✔		✔	
Question 19		x	✔		✔			x	✔		✔			x	✔		✔		✔	
Question 20	✔			x	✔		✔		✔		✔		✔		✔		✔		✔	
Total per student	**15**	**05**	**14**	**6**	**17**	**03**	**15**	**05**	**16**	**04**	**17**	**03**	**16**	**04**	**17**	**3**	**19**	**01**	**18**	**02**
Total	**Correct: 77 Incorrect: 23**										**Correct: 87 Incorrect: 13**									

The students of the "Control Group" worked ontwenty (20) questions in the traditional worksheet. Student "A1" had fifteen (15) correct answers and five (5) mistakes, student "A2" had fourteen (14) correct answers and six (6) mistakes, student

“A3”had seventeen (17) correct answers and three (3) mistakes, student “A4” had fifteen (15) correct answers and five (5) mistakes and student “A5” had sixteen (16) correct answers and four (4) mistakes. In total, the five (5) students of the “Control Group” had seventy seven (77) correct answers and twenty three (23) mistaken.



	Group A’	Group B’
Correct	77	87
Incorrect	23	13

At the same time, the “Experimental Group”worked on sametwenty (20) questions by using computers and ICT The student “B1” of this group responded correctly seventeen (17) questions and wrongly to three (3), the student “B2” responded correctly sixteen (16) questions and wrongly to four (4), the student “B3” responded correctlyseventeen (17) questions and wrongly to three (3), the student “B4” responded correctlynineteen (19) questions and wrongly to one (1) and the student “B5” responded correctly eighteen (18) questions and wrongly to two (2). In total the participants in the “Experimental Group” had eighty seven (87) correct answers and thirteen (13) mistaken ones.

DISCUSSION AND CONCLUSSIONS

In this study 244 participants took part, 114 (46.7%) of them are men and 130 (53.3%) are women. 176 (72.1%) work as permanent employees and the remaining 68 (27.9%) as non-permanent (substitutes). Regarding the 244 sample participants, 127 (52%) are teachers, 64 (26.2%) are deputy head teachers and the remaining 53 (21.7%) are head teachers. 129 (52.9%) work in special primary schools and 115 (47.1%) in special secondary schools. It could be said that this sample shows a relative balance considering the number of its population and the individual characteristics of the participants.

Regarding the age of the participants it emerged that 4.9% (12 participants) are up to 30 years old. From 31 to 38 years old is 25.4% (62 participants) and from 39 to 46 years old is 27.5% (67 participants). Also from 47 to 54 years old is 27.9% (68 participants) and over 55 years old is the remaining 14.3% (35 participants). Therefore, most of the them (69.7%) are at least 39 years old and only 30.3% of the sample is below 39 years old.

Relating to the previous experience of the participants who have worked as head teachers and/or deputy head teachers, it was found that only 13.9% of them are new in the field of Education while the remaining 86.1% have already worked with at least one term (four years) as a head teacher and/or deputy head teacher in Greek special primary and secondary schools. The smallest recorded number of years of work experience and previous service of the participants of the survey is one year and the longest is fifteen.

Regarding the total teaching experience of the survey, it emerged that 90.2% of the participants have at least six years of teaching experience. This fact proves that the vast majority of the participants (90.2%) have extensive teaching experience and only 9.8% of the sample are new teachers with only one to five years of teaching experience in special education.

Of the 244 participants in this study, 178 (73%) have Information and Communication Technology certification that it proves ICT knowledge while the remaining 66 (27%) have no such certification. Therefore, the survey shows a relatively high percentage in terms of ICT certification.

Of this percentage 73% of the participants who has such certification, 29.1% (71 participants) has "ICT Level B2 Certification" which focuses on a practical approach of the ICT that is responsible for developing higher cognitive skills of students. In addition, 20.1% (49 participants) has "ICT Level B1 Certification" and 24.6% (60 participants) has ECDL or similar certification which is theoretically focused for the use of Office applications and simply lesson presentations.

The first research question of this dissertation is related to the degree of integration of Information and Communication Technologies in the teaching of the

participants in Greek special primary and secondary schools. After the statistical analysis of the results, it was observed that the degree of integration of ICT presents remarkable variations and differences. These variations and differences depend on the purposes the participants choose to use ICT or not in their teaching.

More specifically, the statistical analysis of the survey data revealed very high rates of integration in the use of Office applications and the use of projector since the participants stated that they use them "often" or "always" with a percentage of 70.1% and 69.7% respectively.

In contrast, regarding to the participation in activities requiring the use of ICT, a moderate level of integration was recorded because 48.8% of the sample stated that they participate "often" or "always" and the remaining 51.2% participates "occasionally", "rarely" or "not at all" in such activities. Regarding to the application of educational software in teaching, a moderate rate of integration emerged as 45.1% of the participants uses educational software "often" or "always" in their teaching and the remaining 54.9% use it "occasionally", "rarely" or "not at all". In relation to the use of ICT to create educational materials in order to be used in the classroom, a moderate level of integration was found as only 44.3% use them "often" or "always" and the remaining 55.7% use them "occasionally", "rarely" or "not at all".

On the other hand, low integration rates were found in the implementation of educational activities and scenarios using ICT and in the use of Web2 applications and services (or other similar applications and services) as survey participants stated that they use them "often" or "always" with only 39% and 37.7% respectively.

In conclusion, from what it was already mention in this instance, it is easily understood that the survey participants show a high degree of integration in using Office applications and projector for their lesson presentations. On the other hand, however, the results are moderate in terms of the sample's involvement in activities that require the use of ICT, the use of educational software and the use of ICT to create educational materials in order to be used in the classroom. In contrast, the degree of integration of ICT is very low in terms of using Web2 applications and services or other similar applications and services and using ICT to create educational activities and scenarios. Thus, the hypothesis that the educators do not use ICT in a satisfactory level, is partially confirmed. Despite of the fact that their degree of integration was low in the implementation of educational activities and scenarios and in the use of Web2 applications and services, the rate of use of Office applications and projectors was extremely high.

The second research question examines whether the factors a) gender, b) school level and c) training, influence the degree of integration and the way of using Information and Communication Technologies in Greek special schools of primary and secondary education. In regard to the factors of the gender and the school level, no significant differences emerged in this research. These results show that gender and school level do not significantly determine the degree and quality of the kind of

use of ICT in teaching practice. More specifically, male and female teachers did not show considerable differences in quantity and quality in the degree of integration of ICT in their teaching. The same results were found in the analysis of the school level. No notable differences emerged in the degree of integration of ICT between primary and secondary special education. Primary and secondary special education teachers appeared to use also ICT with the same frequency and quality.

In contrast, significant differences emerged in the degree of integration of ICT among survey participants who were certified and those who were not. It is noteworthy that participants who have an ICT certification (73%) seem to use ICT in their teaching much more than their colleagues who have not (27%).

It turns out that the teachers who have "ICT B2' Level Certification" use ICT even more often than their colleagues who have only "ICT B1' Level Certification" or ECDL or other similar certification. In addition, teachers who have "ICT B1' Level Certification" or ECDL or other similar certification apply ICT more frequently than those who have not.

These differences are not only related to quantitative data but also to individual qualitative characteristics. A deeper analysis of the statistical data shows that the type of certification not only determines the degree of integration of ICT but also the way that participants use them in the teaching practice. Teachers who have only "ICT Level B1' Certification" or ECDL or other similar certification tend to use mostly medium quality and tools like Office applications and projector for their lesson presentations. On the contrary, the teachers who have "ICT B2' Level Certification" tend to use tools of high quality and effectiveness such as Web2 or other similar applications and services in order to create educational activities and scenarios. Therefore another hypothesis of the survey is confirmed: the degree of ICT integration is quantitative and qualitative influenced by the training.

The third research question explores the barriers that can make the research participants hesitant and reluctant about using ICT in their teaching practice. The statistic analysis confirms the theoretical part of the dissertation where it is stated that barriers play a significant role in the integration of ICT. More precisely, the hypothesis is confirmed that there are two main obstacles for the degree of ICT integration in special primary and secondary schools in Greece. The first important barrier is the lack of sufficient training and skills in ICT since 65.9% of the participants consider that this condition creates "a lot" or "too much" of hesitation. This barrier is a consequence of the deficiency of training and education opportunities in ICT since 68.1% of the participants believes that this specific situation generates "a lot" or "too much" of hesitation to integrate ICT. Another important obstacle is related to the lack of sufficient logistical infrastructure in special primary and secondary schools in Greece, since 63.9% of the sample stated that this condition makes them "a lot" or "too much" hesitant about integrating ICT in the teaching of their lessons.

In contrast, the participants stated that the other barriers examined in this survey have less impact in the integration of ICT.. The general climate of the school, lack of technical support, inappropriate educational software, shortage of time for lessons preparation and other general problems of organization, are obstacles that play a minor role in the use of ICT since the percentages obtained for these ones are moderate.

The fourth research question concerns the attitudes and perceptions of the research participants regarding the use of ICT in teaching. At this point, it is confirmed that teachers, deputy head teachers and head teachers of Greek primary and secondary special schools have in general a positive attitude towards the use of ICT. This evidence is comfirmed by the fact that 72.6% of the participants tended to consider the use of ICT as a good pedagogical practice. In addition, the positive attitude is also demostrated by the 71.3% of the sample who was inclined to believe that the use of ICT is useful. In the same way, the participants tended to considered the use of ICT as a an interesting practice. However, although the educators appear in essence positive towards the use of ICT, an ambiguity emerged in this survey because almost half of them shows some hesitations. These doubts are related to the moderate percentages observed on whether the participants consider ICT, difficult, time consuming, tedious and unsafe.

In conclusion, there is in principal a positive attitude towards ICT The aforementioned hesitations are closely conected with the lack of training. In other words, the participants with training showed less resistance to integrate ICT in their daily teaching than those who have not. In accordance with these findings emerges the importance of training on issues related to the implementation of ICT in the teaching practice especially the B2 Level training program that includes a practical approach and more efficiency.

The fifth research question relates to the role of the school administration in regard to the issues addressed in the thesis. It investigates whether the school administration enhances the effort of the research participants to be able to integrate ICT in their teaching. From the analysis of the statistical data, it was concluded that the head teachers and deputy head teachers of Greek special primary and secondary schools reinforce and support to a great extent (74.6%) the efforts of their teachers to integrate ICT in their teaching practice. Furthermore, according to the high percentage (71.7%) of the sample, emerged the assumption that the school management takes initiatives to involve the school in ICT programs. Subsequently, it emerged with a high percentage (71.3%) that head teachers and the deputy head teachers in the Greek special schools support and encourage teachers to participate in activities and competitions that use ICT.

In terms of logistical infrastructure, the results of the examined issues showed moderate percentages of satisfaction among the participants regarding to whether the school administration ensures access to the Internet (56.6%), ensures the existence of of enough computers according to the student population (56.6) and at least one in the

teachers' office (55.7%) and whether it promotes the existence and maintenance of a school website (56.1%).

It is extremely important to mention that the examination of this research question revealed the following contradictory conclusion: although the head teachers and deputy head teachers of Greek special primary and secondary schools support and encourage teachers to integrate and participate in ICT activities, they are not able to provide to a satisfactory extent the logistical infrastructure required. This fact was also demonstrated by the results of the second research question related to the barriers to the integration of ICT in teaching, as the lack of the necessary logistical equipment it was one of the highest obstacles to the integration of ICT.

The sixth research question examines if the use of ICT improves the school performance of students with SEN. Through the experimental activity implemented, it was comfirmed the hypothesis that the school performance of this kind of students is better when computers and ICT are involved. It was proved that students who used computers and ICT made fewer mistakes than those who worked with the traditional worksheet on the same exercises. More specifically, students who worked only with worksheets had in total seventy seven (77) correct answers and twenty three (23) incorrect ones (4,6 mistakes per student) whereas those who utilized computers and ICT responded correctly eighty seven (87)and wrongly only thrirteen (13) of the questions (2,6 mistakes per student). The conclusion is that students of the same level and under equal conditions who used computers and ICT had two (2) fewer mistakes than those who did not.

In summary, it is obviously understandable that the integration of ICT into the school reality brings significant benefits to both educators and students. For this reason, the school administration should seek solutions to promote a culture of ICT inclusion, aiming to reduce integration barriers by providing necessary hardware equipment and encouraging opportunities for teacher training. Also, emphasis should be placed on training programs such as the "B2 Level," as they focus not only on theory but also on practical application, which seems to be more effective in increasing both the level and the quality of their integration, fact that has as result the improvement of the school performance of students.

CONTRIBUTIONS

The conclusions drawn from this dissertation provide several significant contributions to the understanding of the examined issues:

Literature Review and Research Tools: The literature review compiled in this dissertation can serve as a valuable tool for other researchers who may wish to explore, under their own perspectives, the examined topics in the future. The same applies to the two tools created and utilized for the research implementation. Both the questionnaire and the experimental activity can be used from others in order to be investigated quantitative and qualitative data regarding the integration of ICT in special education and the role of school management on it.

Degree and Quality of ICT Integration: The dissertation offers insights into the degree and quality of ICT integration in teaching practices within primary and secondary Greek special schools. It identifies variations in ICT usage across different aspects of teaching. By analyzing the frequency and the way of use of ICT and in related activities, the study sheds light on the strengths and weaknesses of ICT integration that require improvement.

Influence of Gender, School Level, and Training on the Implementation of ICT: The research explores the influence of gender, school level, and ICT training on the degree and quality of ICT integration. While gender and school level show no significant differences in the examined topic, training emerges as a significant factor. Educators with training demonstrate higher levels of ICT usage and employ a wider and more quality range of ICT tools in their teaching practices, highlighting the importance of training programs and especially those ones which implement a practical approach like “B2 Level”.

Identification of Barriers to ICT Incorporation: The dissertation identifies key barriers hindering ICT integration in Greek special schools, like the insufficient training, lack of ICT skills, and inadequate logistical infrastructure. By recognizing these barriers, educators and school management can prioritize strategies to overcome them and promote more effective ICT integration in teaching practices.

Attitudes and Perceptions Towards the use of ICT: The study examines educators' attitudes and perceptions towards ICT usage, revealing a generally favourable attitude towards ICT as a pedagogical tool. However, it also highlights concerns and hesitations among educators, particularly regarding the perceived difficulty, time consumption, and safety issues associated with ICT usage. Understanding educators' perceptions is crucial for addressing concerns and fostering a more supportive environment for ICT integration.

Impact of ICT on the School Performance: The experimental activity conducted within the scope of this survey revealed positive influence of ICT on the student performance, noticeable among those with special education needs. The

results indicate that incorporating ICT into learning experiences leads to reduced errors and enhanced academic achievements. These findings underscore the potential of ICT to bolster educational effectiveness and foster inclusivity.

Role of School Administration in the examined issues: The research underscores the crucial role of school administration in supporting and promoting ICT integration initiatives. While educators perceive strong support from school management in encouraging the integration of ICT, there is a noted discrepancy in the provision of logistical infrastructure. Addressing this gap is essential for ensuring effective ICT implementation in educational settings.

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