

University of Ioannina
Department of Early Childhood Education



MASTER'S THESIS

Application of Information and Communication Technologies (ICT)
In Special Needs Education:
A Comparative Study between Greece and Serbia

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Abstract

Nowadays, inclusive education has become an important issue not only in European but also in international educational level as a fundamental right that has come from the principle of equity. In this context, coherent educational policies and practices are necessary to meet the different needs of students and to provide equal opportunities to students with special needs, to participate equally in all educational and learning processes. In addition to this they should also be free to use all types of available ICT tools for learning. This implies that there is free access for all students to appropriate educational programs and materials through the diversification of teaching practices, within the framework of ICT use to all educational levels.

The aim of the thesis is to identify the needs of students with disabilities in education, as well as the existence of the necessary resources and additional ICT support during Higher Education. The second goal is to establish the existence of cross-cultural similarities and differences between the two countries (Greece and Serbia) in the needs or existing educational resources of students with special needs (disabilities).

This pilot comparative study of ICT use of students with special needs makes known that there are similarities and dissimilarities in Higher Education, in between Greece and Serbia. Especially it reveals that there are equal problems in both countries, including the unavailability of ICT use in learning material, and the nonexistence of technologically equipped classrooms for students with special needs.

Keywords: ICT tools, technologies, special needs, Higher Education, inclusive education

1. Introduction

Education implies an organized and methodological approach to obtaining knowledge, the formation of a scientific view of the world and the development of intellectual abilities (Stanford Encyclopedia of Philosophy, 2008).

Education as an essential item in life and society also requires continuous enrichment of knowledge and acceptance of new trends. So, we come to the usefulness of the application of information and communication technologies (ICT), all in order to motivate students, get more quality work and, of course, more proficient teachers. A structural part of teaching is appropriately modern technologies which wish not only to improve the teaching process but to change it as well. ICT's are becoming more and more represented in education. Besides, it has a significant contribution to modernizing the traditional teaching process. Modern education frequently requires constant flexibility, the application of new techniques and methods (Pange, 2016).

Nowadays, education is considered the key to success. Today's people considering that easy access to information and rapid advancement in knowledge are the most important in economic and social development. Kofi Annan (2006) has defined the value of information technologies as follows:

"The new information and communications technologies are among the driving forces of globalization. They are bringing people together and bringing decision-makers unprecedented new tools for development. At the same time, however, the gap between information 'haves' and 'have-nots' is widening, and there is a real danger that the world's poor will be excluded from the emerging knowledge-based global economy."

Knowing that information and communication technologies (ICT) in education began in the seventies, we cannot ignore the fact that the government has accepted the use of ICT in the last decade and significantly

facilitates education (Konza, 2008). It is well documented that the information and communication technologies (ICT) are those that will help to reduce the differences between both individual learning and for integrating learners with disabilities into regular education and school environment will be reduced. ICT's become influential and significant element in daily education. Using ICT's among learners, we can better and faster recognize difficulties in learning; also computer-based intervention tools can play an important role in a child's life (Stevens, 2004).

2. Theoretical Background

2.1. Definitions of terms

The term Information and Communication Technologies (ICT) includes a computer, computer networks, peripherals, and multimedia, as an extensive range of assistive technologies that are accessible to all people including those with disabilities (Toki & Pange, 2014, Pange 2016). ICTs have become component of the everyday life of people. The term "information technologies" is a common name for studying the means, procedures, and methods for managing, storing, processing, transmitting and presenting data and information. Information technologies have emerged from electronics, using achievements in mathematics and physics (Delić, 2008).

(ICT) Encompasses all technical equipment and facilities that convert, process, save and transfer various types of information in digital form. It includes voice telephony, data communications and computer, radio, television and similar technologies (Pange, 2016). Nowadays, copper wires, fiber optics and a variety of wireless technologies can be used for communications and the exchange of data in this context (Dirk et al., 2013).

According to Collins (1996), ICT is a potentially powerful tool for offering educational opportunities. Considering the decade, we live in it is difficult to conceive future learning environments that are not supported by ICT. Looking at modern societies and the so-called digital generation it is clear that ICT's will play a prominent role in the complete learning process today and in the future.

2.2. Applications of ICT

There is many eminent experts and authors from the field who point to the need of research and the constant invention of new methods and techniques. An overview of the situation in the areas relevant to the study is given further.

According to Dirk et al. (2013), the rapid development and increasing global distribution of modern ICT's such as PCs, the Internet, email and mobile phones have transformed the way economies operate and the way individuals, societies, and states interact with each other. ICT enables better access to knowledge for sustainable development and opens new ways of involving large swaths of the population in the political decision-making process.

In medicine, the application of ICT has many benefits. Internet has become one of the primary sources of medical information. Information must be objective as well as comprehended and understood (Silberg, Lundberg & Musacchio, 1997).

In Education, teachers use ICT's for professional purposes. They are focusing on improving the teaching of their subject and of course to enhance students' learning. Also, ICT encourages teachers to be more creative and productive (Liu & Pange, 2015).

2.3. ICT enhancing education

Education has been changed using ICTs, which have undoubtedly affected teaching, learning, and research in all levels (Yusuf, 2005). According to many researches, ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's employees, as well as strengthening teaching and supporting schools to change (Davis & Tearle, 1999; Doulamis et al., 2011).

In a rapidly changing world, formal education is essential for all individuals to be able to access and use information. Development of abilities must be included in everyday educational practices (Glover et al., 2016).

ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere (Pange, 2016). According to European Commission – Press release (2017), EU should increase spending and improve delivery of education in emergencies and protracted crises.

ICT can influence the way students learn, and how they learn where the processes now are learner driven and not imposed by teachers. This, in turn, will prepare the learners better for lifelong learning as well as to improve the quality of their education (Baran, 2016).

Students using ICT can learn and get extra information through e-books, sample examination papers, previous year papers, etc. on their own. This flexibility has enabled students to find answers whenever they want, which was next to impossible before improving ICT (Young, 2002). Students with learning difficulties also have the chance to study easily on an academic level using ICT. The improvement of ICT also has motivated teachers to use these techniques in their teaching process and everyday life (Josefsson et al., 2018).

3. Use of ICT in Education

3.1. ICT in formal education

Sanyal (2001) said that ICT provides new educational approaches. According to Chandra & Patkar (2007) in their paper, they said that *"ICT can provide speedy dissemination of education to target groups."*

ICT enhances the international dimension of educational services. It can also be used for non-formal education like health campaigns and literacy campaigns (UNESCO, 2002). Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real-world problems (Lim & Chai, 2004; Mason, 2000). It improves the perception and understanding of the world of the student. Thus, ICT can be used to prepare the workforce for the information society and the new global economy (Kozma, 2005).

Plomp (2007) declares that: *"the experience of many teachers, who are early innovators, is that the use of ICT is motivating for the students as well as for the teachers themselves."* Bottino (2003) and Sharma (2003) mention that the use of ICT can improve performance, teaching, administration, and develop relevant skills in the different communities.

Hepp, Hinostroza, Laval, and Rehbein (2004) bring up that: *"the literature contains many unsubstantiated claims about the revolutionary potential of ICTs to improve the quality of education."* They also note that some claims are now referred to a near future when hardware will be presumably more affordable, and software will become, at last, a useful learning tool.

Authors Nisar M. W., et al. (2012) in their study 'Usage and Impact of ICT in Education Sector' show that if more availability and usage of ICT in the education sector would rise, then, as a result, more the efficiency of students

would increase. Students agreed that ICT provides vast knowledge to students through the internet and digital libraries, so it can be helpful to enhance the educational efficiency at local, regional and national level.

3.2. ICT in special education

The term 'special educational needs' covers a range of problems which can cause difficulties in teaching and learning (Rivalland J., 2009). Even though there have been many definitions over the years, and comparative studies show that the term 'special educational needs' or 'disabilities' is used for describing different situations to different countries. One of the most dominant categorizations is the one introduced by Meijer et al., (2007) that has recommended a graduated approach to educate learners of special needs.

According to Drigas A. and Joannidou R-E. (2013): *"the term "Special Education Needs" refers to all types of difficulties that can cause a problem during the learning process,"* and that refers to people with a sensory, physical, impairments or learning difficulties.

According to Adam and Tatnall (2008), in their paper about ICT and improvement of Education of Students with Learning Disabilities, ICTs are very important for upgrading the learning experiences in students with disabilities *"For educational purposes, much of the power of the Internet lies in its ability to foster virtual learning communities, and LD students are no exception to this. The difference this technology can make to these students in many ways is remarkable. ICT certainly offers students the capacity to construct their own learning experiences, and our investigations suggest that this applies also to students with Learning Difficulties"*.

ICT can be very useful for all above mentioned impairments and difficulties as they are categorized by the 2001 SEN Code of Practice are Communication and Interaction, Sensory and/or Physical, Cognition and Learning, Behavior, Emotional and Social Development (DfES, 2001).

Especially, there are:

- Visually Impaired learners
- Deaf and Hearing-Impaired learners
- Learners with an Autistic spectrum disorder
- Learners with reading and writing difficulties
- Dyslexia learners
- Learners with difficulties in Math's
- Learners with difficulties in memory
- Attention Deficit Hyperactivity Disorder and Attention Deficit Disorder

In the following paragraphs I will define the main types of disabilities, according to definitions of WHO and other online information

(<https://usability.yale.edu/web-accessibility/articles/types-disabilities>,
<https://academicsupport.georgetown.edu/disability/types>):

1. Visual impairment

Under visual impairment, we mean people visually decreased and blindness. The students who are blind cannot use the monitor and they need to get information from a computer through another sense, such as touch or hearing. Students who are lousy eyesight can receive information through sound or touch or can modify their views on the computer screen so that screen can be more readable.

Assistive visual impairment technologies: Glasses, magnifying glass, voice recorder, large-style books with adequate contrast, screen zoom software, enhanced contrast on screen, screen reader, text reader, printed materials braille script, Braille script translation software, enlarged and / or embossed

letters on the keyboard, Braille keyboard, keyboard with larger keys, Braille typewriter.

2. Hearing loss and deafness

Hearing disorders develop as impaired or completely lost hearing sensitivity, which severely impedes the development and use of speech and language, as well as the social communication of the child. A hearing is a leading input for learning speech, so verbal communication, that is, speech and language can hardly be developed, or this process is long-lasting and painstaking. Loss or hearing impairment has an invaluable influence on the development of speech and language. Consequences of minor hearing damage are seen in learning difficulty. There are also limited vocabulary, problems in written expression, difficulty understanding written text and educational background.

For hearing problems, we can use: Pen and paper, Portable word processing machine, Signal devices (e.g. visual bell or vibrating pager), Systems with extra non-verbal information, Titration in real time, Light signal on the computer as a warning signal, Telephone amplifier, Personal amplifier / hearing system Inductive loop as amplifier and filter sound in a defined space, FM amplification system, System infrared signals, Mobile phone in the function of assistive technologies.

3. Speech Impaired

Speech damage implies states such as aphasia (loss or damage to the ability to use or understand words, often occurs as a result of brain damage), delayed speech (a symptom of cognitive impairment) and other conditions that they are reflected in memory impairment, difficulty in resolving problems or inability to receive sensory information. For students with this kind of damage, complex visual representations, or word choices can make computer use more difficult. Users will find it easier to use the program that was created to reduce

confusion and similar objects that are on the screen, and in this way, the screen becomes more inviting and more accessible to users.

The most common assistive technologies that people with damaged speech use: Keyboard Filters, Programs for Voice Recognition, Screen Recovery Utilities, Voice Synths.

4. Physical disabilities

Those students who have the problem of skills and agility of the hands, hands and they are not able to use keyboard or mouse, or they may need adjustments to adjust the typing or use options of the mouse. For example, some people cannot press multiple keys at once (such as Ctrl + Alt + Delete). While others can suddenly typing several keys or unintentionally pressing some buttons. Some students can use their hands and legs, but they move in a limited way. All of these conditions may make it difficult to use a mouse or keyboard, or it may be completely disabled. Assistive technologies for mobility and hand skills are alternative keypads, joysticks, device to manage breathing, trackball tracking, tracker, and switch – button.

Inclusion and ICT support

According to Suzić (2008), the notion of 'inclusion' originates in Latin, and it means inclusion, capture, and default. The original meaning can be found in two Latin words. The first is '*include*' that means locking, closing, to bend. The other one included the prison, the closing. Derived from these meanings, the notion of inclusion would be implied integration, framing, and in a social sense the involvement of an individual in a community which is more or less closed or open hole. It should be kept in mind that the concept of integration comes from the word '*intēgre*,' which means unskilled, clean, impartial, selfless, and honest. In the attempts to define the concept of inclusion and inclusive education, there are various, often opposing views, which makes this idea controversial. Inclusion at the same time refers to social and educational

values, but also to individual values of an individual. Inclusive education is spoken of as a concept, a movement, a theory, a philosophy, process, educational practice, education policy.

According to all these studies we can say that the inclusion of many students is not achievable and does not lead to an equal level of education for all learners. It is not enough to change the learning environment and the pedagogical approaches, something more is required. This is where Information and Communication Technology come in and play a dynamic role (Murthy et al., 2015).

According to Stanković (2014) with an ultimate goal to successfully apply new technologies following is needed:

- *“To study, analyze and experiment with new information and communication technologies,*
- *Indicate, highlight, initiate and explain to members of the team the possibilities and necessity of application and use modern technologies when working with children with developmental disabilities,*
- *Accept the role and importance of information and communication technologies and computers in modernizing the program and treatment of special education and rehabilitation.”*

Starcic A. and Bagon S. said: *“Research and development of information and communication technology (ICT) - supported learning for people with disabilities has not received adequate attention. It is also difficult to access research findings and developments in this field. Under the ENABLE Network of ICT Supported Learning for Disabled People (2011–2014) project, an emerging European Union reference point portal for end-users will provide this information for a broad audience.”*

Recently, there has been a growing number of researches that support the fact that ICTs and assistive technologies more generally, enable people with special educational needs to lead more fulfilled lives (Dillon, 2014; Stevens, 2004).

Frequently we find people with more than one form of disabilities. So we need to expand the use of ICT in school, home social and/or virtual community. Many studies declare that the use of ICT gives people with disabilities equal opportunities in learning and promoting their self-advocacy (Edyburn, 2001).

It has been suggested that technologies are the great equalizer that for many people with disabilities technologies can serve as a kind cognitive prosthesis to overcome or compensate for differences among learners. This idea has significant implications for learners with disabilities and special educational needs because it suggests that technologies can help create the conditions for equal opportunity to learn and equal access to the curriculum for all (Dillon, 2014).

Williams P., Jamali R.H. and Nicholas D. (2006) in their research said *“Although the literature shows a great number of ICT initiatives for people with all kinds of disabilities, there has been a surprising lack of research into the usability of the various applications developed, and even less concerning those with learning difficulties. The review of existing literature indicates a lack of attention to the application of ICT for people with SEN, compared to the other groups of disabled people such as visually impaired.”*

Wastiau P., Blamire R., Kearney C., Quittre V., Van de Gaer E. and Monseur C. (2013) in their research article *The Use of ICT in Education: a survey of schools in Europe, came to the conclusion that the survey results point to a number of policy actions at all levels of the system to ensure optimal use of increasingly tight financial resources. European policies can play a major role to support all the above policies and actions needed to bring about a digital education system and increase the number of digitally supportive schools,*

digitally confident and supportive teachers as well as students by continuing to monitor progress in all Member States regularly. Particular attention should focus on countries where the practical use of ICT in T&L still lags far behind education systems in other countries.

Karen Stendal (2012) in her literature review on a theme 'How do people with disabilities use and experience Virtual Worlds and ICT' finds out that: *"Several research disciplines have focused on how people with disability can take advantage of the technology available for social, educational and personal purposes. Virtual worlds represent the latest addition to the technologies available. The main objective was to highlight areas that lack sufficient research in the field of virtual worlds for people with disability."*

Students with disabilities from all over the world need ICT tools like a smartphone, laptop computer, tablet, desktop computer to provide all necessary support to disabled students (Eches, S., & Ochoa, 2005).

Additionally, Adam, T., and Tatnall A., (2008,) discuss about the appropriate use of ICTs for students with disabilities. They say that *"... technology can make a significant difference to educating these students, but only if it is used appropriately"*

Modern technologies brought many respectable effects for overall human being, but there are some counter effects. People are much less active since they can do many things from their house without leaving it. This offers opportunities for work to disabled persons. My concern is that further development of ICT's will keep disabled more socially isolated even though their qualities will reach its potential if we do not make any improvements to our educational system. To avoid this to happen, ICT should be just one part of a much bigger program in which students with disabilities must participate (attending classes with all other students, field trips, group activities, etc.) (Adam & Tatnall,2008).

3.3. Quality of Education

Ensuring quality control is particularly important and represents a process that it must undoubtedly become an integral part of every educational system. Children have a right to an education, a quality education. Quality is equally important when it comes to special education (Ristić, 2007).

According to Subotić (2011): *“There is no doubt that “quality” is the most commonly used word in all discussions on higher education or on education in general. In spite of that, the concept of quality itself remains insufficiently defined and almost always used in the sense in which it can serve to promote a particular idea”.*

Quality control is a long-term process that ensures compliance with the agreed standards. These standards should ensure that each educational institution can meet the set criteria for quality assurance. The goal of quality control is to improve education and therefore should be an integral part of all levels of education, of all aspects of education (subjects, programs, institutions, professional staff, etc.) and be a continuous process (Gajić et al., 2009).

The culture of quality in higher education institutions according to Ristić (2007) should be encouraged and developed, and this way must show its responsibility and should present its quality for development processes for diversity and innovation.

The goal of European experts is to form a society based on knowledge and education, which means that ensuring the quality of higher education, but also scientific work is essential (Gajić et al., 2009). This question was so far mainly on the margins of theoretical studies, empirical research, and practical achievements. The quality of higher education is determined as the quality of the study program (curriculum), the quality of the teaching-scientific process,

quality of achievement of learning outcomes or competence acquired by ending staff study programs (Subotić et al., 2011).

Quality in education is also important when we talk about education in general, as well as special education. To ensure quality education, it is vital that concerned Ministries, competent authorities, and teachers do everything in their capacity to improve education. Teachers should keep up with progress and adapt the quality improvements to their classroom and their students. Information and Communication Technologies play a big role in this idea (European Commission, 2017).

According to (https://ec.europa.eu/education/study-in-europe/planning-studies/european-higher-education_en):" Each country has its own individual higher education system – but all are part of the European Higher Education Area (EHEA). The EHEA system helps ensure that higher education systems across Europe are compatible - and that students, researchers and academics in Europe can collaborate and study or work abroad more easily. Qualifications across Europe are comparable through the European Qualifications Framework."

Quality in education includes ICT proper use for learning and ICT use for all disabled students. ICT facilitates the learning and teaching process and is vital for both teachers and students.

4. The educational system in Greece and Serbia

4.1. Higher education in Greece and Serbia

Although there are many challenges upon us when it comes to Higher Education there are still many positive achievements in modern Higher Education. Some accomplishments are that Higher Education becomes available to everyone not only the elite, Higher Education enables research which leads to progress in society and less but not least Higher Education provides opportunities for social mobility (Altbach & Chait, 2001).

According to Subotić (2011), the new vision and altered paradigm of higher education offer open approaches and changes and has a unique role in ensuring the economic and cultural development of society and social cohesion. New tendencies must be directed towards students, towards different didactic approaches and strategies, better communication between teachers and students, which will indicate new qualitatively different signs of community relations and partnership.

4.1.1. Higher Education in Greece

It has long been recognized that the Greek education system is very centralized both regarding organization and administration (OECD 1982). In the past two decades, an effort has been undertaken to reform, modernize and decentralize the system with major legislative measures affecting all levels of education. According to the Greek Constitution, the State has the responsibility to provide free education at all levels from pre-school to university. A small number of private colleges exist, but at the university level, only State universities and institutions are recognized to grant degrees. Despite the diminishing return to educational investment in Greece (Lambropoulos and Psacharopoulos 1992), the demand for higher education has increased steadily.

The Greek educational system comprises of three levels: primary, secondary and tertiary, with an additional post-secondary level providing vocational training:

1. Primary education consists of:

- Kindergarten; lasting one or two years
- Primary school spanning six years (ages 6 to 12).

2. Secondary education:

- Gymnasio (variously translated as Middle or Junior High School),
- Three-year school, after which students can attend Lykeion (an academically oriented high school)
- Vocational training.

3. Higher Tertiary education is provided by Universities and Polytechnics, Technological Educational Institutes and Academies which primarily cater to the military and the clergy.

- Undergraduate courses typically last four years (5 in polytechnics and some technical/art schools, and 6 in medical schools)
- Postgraduate (MSc level) courses last from 1 to 2 years and doctorates (Ph.D. level) from 3 to 6 years (online information Alikianou School)

In Greece four primary levels of education exist (i.e., kindergarten, primary education, secondary education, provided in the lower secondary schools and the general or vocational upper secondary schools, and higher education, which includes the universities and the technical institutes) and the schools within all these levels can be either public or private. Even though not

all the levels are compulsory, students are obligated to attend school for nine years and ages 6-15. This means that they should complete primary and lower secondary school (CIA, 2014).

The higher education sector in Greece consists of 19 universities (including the School of Fine Arts) and the Hellenic Open University and 14 Technological Educational Institutions (TEIs) which belong to the technological (non-university) sector. They are all public. There are 240 university departments and 170 departments at the technical, educational institutions, a number that has increased by 43 % over the last ten years. At this point of time we are witnessing reforms within Greek Higher Education. Process of upgrading TEI's are going in two different directions: First option for TEI's is to become Universities; Second direction is going towards an idea of introducing TEI's into regular Universities by creating new, technical Departments. As any other educational process, this idea will take several years to be completed.

In Greece, each department in Universities corresponds to a specific subject or discipline leading to a degree. Approving a new department means accepting a new degree. The Ministry of Education is responsible for the approval of new institutions and new departments. However, the development of the corresponding study program is the responsibility of the institution.

There are three levels of study in Greek universities. The first is the undergraduate level, which leads to the first degree, called '*diploma*' or *ptychio*. The length of studies at this level varies from four to six years. Studies in medicine last for six years, whereas in engineering, agricultural studies, dentistry and pharmacy, fine arts and music they last for five years. In all other fields, they last for four years. Postgraduate studies are divided into two levels. The lower level is of one year's duration in most cases and leads to the equivalent of a master's degree. This first degree is called *metaptychiako diploma idikefsis*, the '*postgraduate specialization diploma*' and *didactoriko PhD*. Graduates have access to postgraduate studies, which are offered exclusively by the universities (Tzankou, 2017).

Greece is in the European Union. Greece has a widely known famous history, and is a small country in South-Eastern Europe with a population about 11 million people. In the past decade, Greece faced the financial struggle that hit almost every aspect. The educational system experienced effects of a mentioned crisis. Higher education is one of the primary missions of the Greek state, and article 16 of the Greek Constitution stipulates that all Greeks have the right to free education at all levels (Tzankou, 2017).

4.1.2. Higher Education in Serbia

Serbia, officially the Republic of Serbia, is a sovereign state situated at the crossroads of Central and Southeast Europe in the southern Pannonian Plain and the central Balkans (en.wikipedia.org). Among the goals of a united Europe is the creation of a European knowledge society based on two pillars - the European Research Area (ERA) and the European Higher Education Area (EHEA). Their realization has a particularly strategic place in the European integrations (Komnenović, 2005).

The Republic of Serbia is trying to find its way and direct the movement in that direction. The impression is that in this condition of the accelerated search for ways of implementing reforms the path to "standardization" and "equalization" of higher education in Europe is sought, while completely forgetting about the fact that it is an idea of "harmonization" with the European education. The system is directed primarily towards respecting the fundamental principles of autonomy and diversity, which will modernize the education system and make it part of general globalization as the tendencies of the new world. Therefore, with more courage, it is necessary to accept the fact that the current social, economic and political context and perspectives of a united Europe, as well as the processes of globalization, are solid arguments that support the European and global need for the compatibility of educational systems (Živković, 2007).

Since 2000, education in Serbia has been going through reforms that have been associated with the expected dilemmas. Students' educational attainment standards have always been part of the idea, although the process of reform often changed the direction and conception. In the beginning, the emphasis was on developing standards for the end of elementary education, while lately there has been a big discussion about developing standards for general secondary education. The main issues in the education system in Serbia are the function, procedures, and content of educational evaluation.

According to the authors Emina Hebib, Vera Spasenović and Zorica Šaljić, the main reasons that led to the need for specific changes are quoted below:

- the existence of growing demands for achieving effectiveness,
- efficiency and equity of education to respond to economic and social challenges;
- the need to monitor and supervise the quality of the schools, which occurs as a consequence of giving them a greater autonomy;
- the need to base decision making, to a greater extent, on evaluation results, thus making it evidence-based;

The evaluation system in Serbia we can be divided into three segments:

1. External school evaluation which is estimated in seven work quality domains (school curriculum; teaching and learning; students' achievements; support to students; ethos; resources; management, organization and quality assurance) and the general score of school work quality is given on a scale from 1 to 4.
2. School self-evaluation
3. Evaluation of students' outcomes where we have tests of students' achievement and final exams

When we are speaking about external school evaluation we can say that two types of supervision exist; the first one is the inspection supervision which is within the jurisdiction of municipality, i.e., the city administration where educational inspectors, by a direct insight into school work, consider the possible implementation of the law and the second one is pedagogical supervision of school work which is within the jurisdiction of the Ministry of Education, where the supervisor observes and evaluates teaching and other school activities, implementation of plans and programs, ensures the support and help the employees and proposes measures for a quality improvement (Zakon o osnovama sistema obrazovanja i vaspitanja, 2009).

The second segment is the committee consisted of:

- I. School director
- II. Professors' representative
- III. Parents' council representative
- IV. Students' parliament president

They evaluate the quality of education programs; all forms and methods of teaching delivery; professional development of teachers and other school staff; conditions in which school work is carried out; student and parent satisfaction with school work (Pravilnik o vrednovanju kvaliteta rada ustanova, 2012).

Finally, is the evaluation of student outcomes. As already mentioned in the paper, the evaluation in education has gone through several changes over the past years. Besides, conducting evaluation research into students' achievements and the introduction of final exams at the end of elementary and secondary education are of importance in the domain of monitoring students' work and development (Hebib et al., 2011).

4.2. Special education in Greece and Serbia

“Most people see what is, and never see what can be. “– Albert Einstein

According to UNESCO's definition, inclusive education appertains to the ability of the school to provide quality education to all children, regardless of their diversity. Inclusion is defined as a process of recognizing and responding to different needs of children through increasing participation in learning, cultural life, and community life, as well as by reducing exclusion from education. The school should provide equal education for all children, and attention should be given to children with special needs and children from marginalized groups.

4.2.1. Inclusive education in Greece

Greece is a European country known for the democratic values and its social justice. In a political system like this, where the government is elected by the people, the Prime Minister and his fellow ministers make decisions on behalf of the Greek population. This feature, centralization in decision making, is a core characteristic of the society, in all its sectors, with the education sector included. More specifically, in terms of education, the Ministry of Education formulates and establishes all the policies, the syllabus and the curriculum for any type and level of schooling and, in this way, Greek schools belong to the group of schools, operating in the OECD countries, with the lesser degree of autonomy (OECD, 2012).

A major aim of the Education System is to build well-rounded personalities and educate all the students intellectually, physically and morally, to make them responsible as adults and considerate as citizens (European Commission).

Since the private ones seem to have, more give more facilities to their pupils, because they are funded not only by the state but, also, from private organizations and other 38 sponsors. Speaking of primary education, its duration is six years, and it includes six grades, covering ages from 6 to 11. Besides the ordinary primary schools, there are various other types, like intercultural, experimental schools as well as primary schools for minority students and students with SEN (Community for schools in Europe, 2015).

Policies and Studies about inclusive education for Children with special educational needs in Greece in the Greek education system, the Ministry of Education develops specific goals and regulations for the provision of education in every group of students and states that all the children, regardless of their needs and competencies, must learn in inclusive environments, if possible.

According to Greece (OECD, 2012): *“SEN refers to difficulties in learning due to sensory, intellectual, cognitive, developmental, mental and neuropsychiatric disorders, which are localized after a scientific and pedagogical evaluation. These difficulties influence the process of learning and school adjustment. Pupils with SEN are considered those pupils who have disabilities in motion, vision, hearing, who suffer from chronic diseases, disorders in speech, attention deficit, and all-pervasive developmental disorders.”*

Children, exhibiting at least one of the characteristics, belong to one or many of the following categories of SEN: children with physical disabilities, hearing or visual impairments, general and specific learning difficulties, ASD, mental impairments and multiple disorders (OECD, 2005). It should be mentioned here that the first three categories are not analyzed at all in the study. With the focus being on the mental forms of disability only, it is a fact that in Greece in most of the cases various impairments coexist in a student, to a lesser or greater extent. OECD (2005a) presents the national definitions of the

mental disabilities, i.e., mental impairments, autism and learning difficulties, and provides data for students' allocation in primary school and special schools.

First, children having been diagnosed with IQ lower than 70 are considered as students with mental impairments and, in this case, is either able to receive an education (IQ 50-70) or only training (IQ 30-50) or they are treated as individuals with severe retardation (IQ < 30). Most of the times, this disability is accompanied by behavioral problems that negatively affect children's social life. For this category, it is revealed that almost all the students are placed in special school, and only a 30% of this population is included in special classes within the regular primary schools (OECD, 2005).

Into the second category fall children who show abnormal behavior. This group of children, with severe autism, is not recognized by the national legislation as disabled. For that reason, no special support is provided to them, regarding human and material resources.

Only recently, the Ministry of Education in Greece passed a law for the placement of special education teachers in regular primary schools, where students with non-severe autistic behaviors are included (Zoniou-Sideri, 2005).

On the other hand, children with profound autistic behaviors are placed, from the Ministry of Education, directly to special schools. In general, the main priority of the education system for these children is to help them develop their social and functional skills first, and after that to help them earn knowledge. Moving on, to the third and last category belongs to the school-aged children with general or specific learning difficulties. This SEN encompasses a vast number of other categories, with the most common being dyslexia, aggressive or solitary behavior, emotional inconvenience and problems in communication. These students during the school day attend regular classrooms and, also, spend some of the school-hours in inclusive classes, so that they can receive extra support in some subjects from special education teachers. In general, as law imposes, when children with SEN enroll in regular primary schools, they can either attend a mainstream class, followed by the necessary transformations in

the teaching practices and the placement of at least one special education teacher in the regular classroom for the provision of further and individualized assistance, in close always cooperation with the main teacher, or attend a special class at the same time with the regular one, when systematic monitoring and support is needed (European Agency for Special Needs and Inclusive Education). But what happens when, finally, children with SEN are included in mainstream in primary schools? Two studies display their findings that seem to be slightly disappointing, compared to what the legislation suggests. The first study, with the self-explanatory title “Inclusive classes in Greece: New names, old institutions”, criticizes the replacement of the term ‘Special Classes’ with this of ‘Inclusive Classes’ in the Greek education policies for inclusion, since, as it is claimed, the philosophy behind that has remained as such, becoming a barrier to full and successful inclusion (Zoniou-Sideri, 2005).

What it is also revealed by the researchers is that most of the students in special classes, operating in primary schools, are children with specific learning difficulties and ASD. Furthermore, back to the regular classes, 70% of the Greek teachers report that they adapt the curriculum to the capabilities of children with SEN, while the rest of them follow the curriculum that is developed for regular classes with no modifications of it. At the same time, even when teachers are keen on efficiently helping these children, the lack of material resources in the public schools is a factor that hinders the efforts they make every day in the classroom. The second research does also have a somewhat critical view matters towards what is pursued with the function of special classes. Here, the European Agency for Special Needs and Inclusive Education shows that, in Greece, putting disabled children into the special categories is only used to help them follow the mainstream classroom's curriculum and everyday routines and, thus, nothing has been achieved towards their inclusion (Kavouni, 2016).

4.2.2. Inclusive education in Serbia

In 2000, Serbia began to deal with this problem genuinely. After a series of laws and bylaws were adopted, setting the foundations of the inclusive, comprehensive educational system whose goal should be to develop to the child's personality, talents, mental and physical abilities to their last opportunities, as well as the preparation of a child for active community life (<https://pescanik.net/inkluzivno-obrazovanje/>).

According to Spasenović et al. (2015): *“Starting from 2002, one of the priorities of the Serbian educational authorities has been to increase accessibility of education and create conditions for quality education for all students in the country. These goals can be accomplished in the inclusive concept of education.”*

Inclusive education should remove all kinds of barriers and discrimination, such as gender, ethnic origin, religious or socioeconomic background, abilities, medical condition or any other personal characteristic of an individual, as well as provide social cohesion. Changes in the education system aimed at increasing inclusion are expected to enhance accessibility and quality of education largely, primarily within the regular system of education, for children from socially unsupportive environments (Roma, poor, rural, displaced), children and adults with developmental impairments and physical disabilities, and children with learning disabilities (Hebib et al., 2015).

At the end of the first decade of the 21st century, inclusive approach to education was supported by introducing *The Law on the fundamentals of the education system* (Službenik glasnik Republike Srbije, 2009).

Children with developmental difficulties can be enrolled into school based on a recommendation of the child's doctor working at the community

health Centre, providing that a relevant commission evaluated the student's needs for additional educational, medical or social support and the parents gave their consent. A developmentally impaired or physically disabled student should take the final exam adapted to his/her motor and sensory abilities, i.e., to conditions dictated by a certain type of disability or in keeping with the individual education plan that has served as the basis for his/her education. Hiring a pedagogue assistant should help teachers, preschool teachers and associates in extracurricular and curricular activities as a form of additional support to children and students, suitable to their needs (Živković, 2007).

According to Maksić & Spasenović (2013): *“School year 2010/11 marked the beginning of the practical implementation of inclusive education in Serbia. What did educational authorities do to provide conditions for application of inclusive education policies? First, they conducted training on inclusive education, attended by over 10,000 employees in the education sector. According to the 2012 data, all schools in Serbia received basic training for inclusive education, while 320 schools received advanced training.”*

Additionally, every school received inclusive education materials for teachers. Overall, 94% of municipalities in Serbia conducted at least one project in this field: 307 regular schools, 56 preschool institutions, and 140 schools implemented Roma inclusion programs, while 49 preschool institutions and 126 schools hired a pedagogue assistant and received equipment necessary for inclusive education. Manuals and guides for enhancement of inclusive practice were published, such as *The guide for advancing inclusive education practice, The manual for inclusive school development, The collected examples of inclusive practice, Teaching strategies for children with developmental impairments and physical disabilities, Professional competencies for inclusive education*, etc. The national network of support for inclusive education comprised of 80 experts and practitioners and 14 model schools were formed (Maksić & Spasenović, 2013). In Serbia Special Education is supported by the Government and implementation process is still in progress and is being improved.

5. Methodology

5.1. Materials and Methods

Methods and techniques of applied research (quantitative and qualitative) were used in the function of realization of set goals and tasks of this research.

We used descriptive statistics as a method to summarize the replies of the participants, and to compare with relevant research and experiences. Additional statistical methods, chi-square were used for testing hypothesis and deduction of results.

5.2. The goal

The aim of the study is to identify the needs of students with disabilities in education, as well as the existence of the necessary resources and additional supporting facility for learning. Additional we want to find the existence of cross-cultural similarities and differences between the two countries (Greece and Serbia) in the needs and existing educational resources of students with disabilities.

5.3. Hypotheses

H1. Whether students with disabilities have additional assistance for their learning needs

H2. There are cross-cultural differences in the provision of assistance for learning between students with disabilities in Greece and Serbia.

5.4. Instrument

For the purposes of this research, a questionnaire was designed. This instrument was answered by students with disabilities from Greece and Serbia. The questionnaire consisted of two parts. The first part consisted of general questions, age, sex, faculty, student type, type of person's disability. The second part included another set of questions, related to the needs and support of the student with disabilities. Additional for this study we interviewed all participant, and we analyzed their replies.

5.5. Sample

The total sample in our research consisted of 20 respondents, ten students with disabilities who are studying at one of the universities in Serbia and ten students with disabilities who are studying at one of the universities in Greece. 45% (9) of the sample were women, and 55% (11) of the sample were men. The average age of the respondents was about 25 years. The youngest respondent is 18 years old, and the oldest is 47 years old. All respondents were interviewed in November and December 2017.

Table 1. Sex and Age

		Sample	
		N	%
Gender	Men	11	55
	Woman	9	45

		Sample	
		N	%
Gender	Men	11	55
	Woman	9	45
Age	min - max		M (SD)
		18 - 47	25.65 (7.08)

Table 2.

TYPES OF DISSABILITIES	
Visual impairment	8
Deafness	6
Speech Impaired	2
Physical disabilities	4
Total	20

Table 2. shows that most of respondents were with Visual impaired, while on the other end the least number of respondents had Speech problems.

5.6. Procedure

Prior to the conducted research, the student's consent was obtained. The data were collected in the period November-December 2017 in Greece and Serbia. After the oral consent of the participants, a questionnaire was filled in, which guaranteed their anonymity.

5.7. Interviews

After the respondents completed the questionnaire, a short interview was conducted by myself with all participants and the teaching staff. The

interview was unstructured with open-ended questions where they were free to express their opinions. All their replies were written down and analyzed by me.

5.8. Statistical data processing

The data were processed in the SPSS 21 software package. Descriptive statistics were used. Cross-tabulation and Pearson's chi-square test was used when appropriate, for cross-cultural comparison. The results are tabulated and graphically presented. The main limitation of this sample was the number of respondents.

6. Results and Discussion

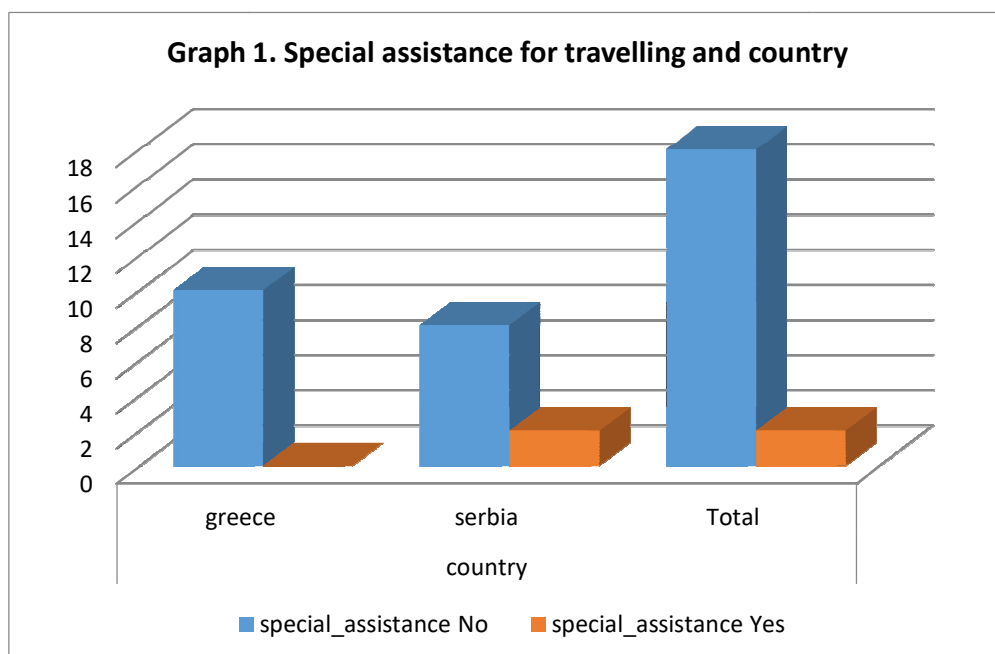
Most respondents said how much they needed more support and understanding of the professor (table 3). Since, they did not count on information and communication technologies as well as on assistive technologies at the start, because they used the most basic technics of what they needed before they even entered the faculty.

Several respondents (5 students from Greece and 7 students from Serbia) expressed their opinion that their studying would be easier if the equipment were more modern. In conversation with professors, we concluded that the application of ICT would significantly facilitate the monitoring of teaching to professors and students, as well as students with disabilities.

Table 3. Country and special assistance for traveling

	Special assistance		Total
	No	Yes	

Country	Greece	100%	0%	100%
	Serbia	80%	20%	100%
Total		180%	20%	200%



Using cross tabulation, the additional needs of students with disabilities in relation to transport to the faculty are shown on graph 1. Only two

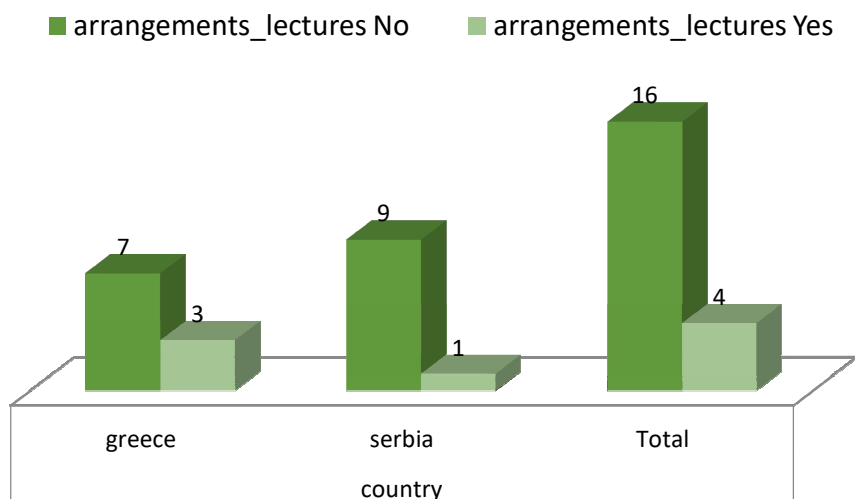
respondents consider that they need special help with traveling to college. Both students are from Serbia (graph 1). None of Greek students has indicated the need for this type of assistance.

Students with disabilities said that they need special arrangements when attending lectures using ICT.

Table 4. Country and special arrangements on lectures

		Arrangements lectures		Total
		No	Yes	
Country	Greece	70%	30%	100%
	Serbia	90%	10%	100%
Total		160%	40%	200%

Graph 2. Country and special arrangements when attending lectures

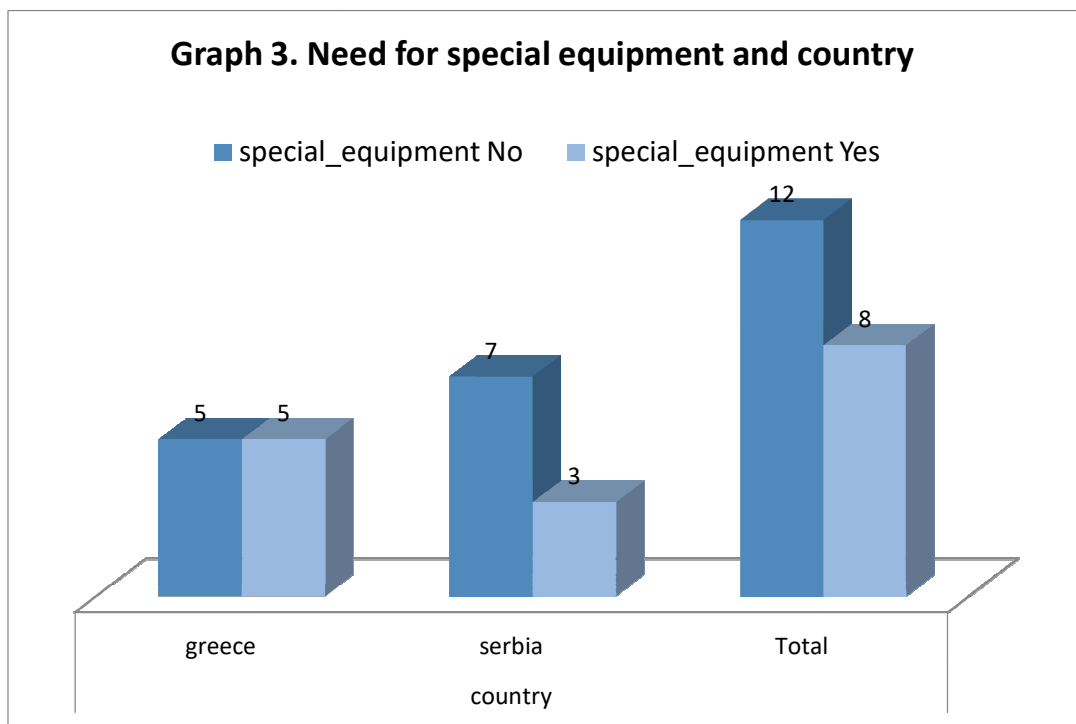


Using cross tabulation, percentages, the additional needs of students with disabilities are presented, as well as the special conditions for attending classes (table 4). Four respondents (graph 2), believe that they need special arrangements for lectures. Of these students, three are from Greece and one student from Serbia.

Students with disabilities need special equipment in completing course assignments.

Table 5. Country and need for special equipment

		Special equipment		Total
		No	Yes	
Country	Greece	50%	50%	100%
	Serbia	70%	30%	100%
Total		120%	80%	200%



Using cross tabulation, the additional needs of students with disabilities, and in relation to the special equipment necessary for attending classes or taking the exam are shown (table 5).

Eight respondents think they need additional equipment. Five students are from Greece, and three from Serbia (graph 3).

Students with disabilities in Greece and Serbia do not differ in terms of the need for additional equipment to monitor teaching and taking the exam.

Students with disabilities need special arrangements for examinations and use of ICT.

Table 6. Country and special arrangements for examinations

	Separate room		Total
	No	Yes	
Country Greece	40%	60%	100%
Serbia	100%	0%	100%
Total	140%	60%	200%
	Extra time		Total
	No	Yes	
Country Greece	60%	40%	100%
Serbia	50%	50%	100%
Total	110%	90%	200%
	Equipment examinations		Total
	No	Yes	
Country Greece	90%	10%	100%
Serbia	90%	10%	100%
Total	180%	20%	200%

	Rest breaks		Total
	No	Yes	
Country Greece	80%	20%	100%
Serbia	90%	10%	100%
Total	170%	30%	200%

Using cross tabulation, the additional needs of students with disabilities, and in relation to special conditions when taking the exam are shown. There were four needs examined: the need to take the exam in a separate room, the need for additional time, the need for special equipment, and the need for a pause.

Table 6. shows that six students believe they need to take the exam in a separate room. All six students are from Greece. The results show that the differences in exam participation are significant ($\chi^2 = 8.571$, $p = 0.003$). Students with disabilities in Greece and Serbia differ significantly in terms of the need for an additional room when taking the exam; thus, students in Greece more often show this need.

Nine students believe they need extra time when taking the exam. Four students are from Greece and five from Serbia.

Two students believe they need extra equipment when taking the exam. One student from Serbia and one from Greece.

Three students think they need to take breaks when taking the exam. Two students are from Greece and one from Serbia.

Both students in Greece and Serbia often have tutors based on their special needs.

Table 7. Country and tutor

		Tutor		Total
		No	Yes	
Country	Greece	50%	50%	100%
	Serbia	50%	50%	100%
Total		100%	100%	200%

From Table 7., we see that five students in Greece and five students in Serbia have a tutor in learning. The same number of students in both countries has no tutors.

On a total sample of students, 10 of them have a tutor, and 10 of them don't. Without further tests, we can see that in relation to this issue the situation in both countries is the same.

In Greece, the needed learning material is more often adapted.

Table 8. Materials and learning support

		Available materials		Total
		No	Yes	
Country	Greece	100%	0%	100%
	Serbia	90%	10%	100%
Total		190%	10%	200%
		Adapted texts		Total
		No	Yes	
Country	Greece	60%	40%	100%
	Serbia	60%	40%	100%
		Interpreters		Total
		No	Yes	
Country	Greece	90%	10%	100%

	Serbia	100%	0%	100%
Total		190%	10%	200%

Table 8., according to the interview, shows that 50% of students (3 from Greece and 7 from Serbia) said that it would be easier if they have adequate educational and textual materials with enlarged letters. Two of them said that if they have books with appropriate contrast, they will speed up their learning.

Also, if in class exist, interpreters, they will spend less time trying to catch information, and they will understand better.

Students in Greece are more inclined to use ICT.

Based on conducted interviews I came to conclusion that more students from Greece are inclined to use ICT. They said that from the beginning of their study some of ICT's was necessary to follow the lesson easily and later to solve tasks, so they used on it.

In each of the two countries surveyed, eight students consider that ICT is essential for their studies, while two students from both countries consider that ICT would not significantly help them in their studies.

The same number in both countries is for and against, so without further tests, we see that there are no differences in this attitude in terms of cross-cultural differences (table 9).

Table 9. The significance of use ICT

Country = Greece	Frequency	Percent	Valid Percent	Cumulative Percent
Valid No	2	20.0	20.0	20.0

	Yes	8	80.0	80.0	100.0
	Total	10	100.0	100.0	
Country =	Serbia	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	2	20.0	20.0	20.0
	Yes	8	80.0	80.0	100.0
	Total	10	100.0	100.0	

According to our findings, this research was conducted on a sample of 20 students: ten from Greece and ten from Serbia, the average age of 25 years. The sample was approximately equal to gender (55% female). The research examines the value of the use of information and communication technologies (ICT) in the education of students with special needs (disabilities).

Table 3 shows that five students from Greece and seven from Serbia expressed their opinion that their studying would be easier if the equipment were more modern.

Table 4 shows that four students need special arrangements for lectures, three were from Greece and one student from Serbia.

Eight respondents show the need for special equipment which can be seen in Table 5. Five students were from Greece and three from Serbia.

Such an assumption is in line with the research conducted by Kavouni K. (2016), which showed that 70% of Greek teachers in elementary schools are trying to adapt the curriculum to the abilities of students. On the other hand, it is possible that there is still insufficient awareness about the needs of students with disabilities and that such interventions can be expected in the future. It should be noted that the Ministry of Education of Greece has recently enacted

a law on the employment of teachers of special education in regular primary schools.

Also, the fact that 80% of students believe that information and communication technologies are important for their studying confirms the importance of ICT for the education process, especially for students with special needs. This data is in accordance with the findings of the authors Nisar, Munir & Shafkat (2012) showing that ICTs enable higher education efficiency. It is important to emphasize what Karen Stendal (2012) points out in her literary review that ICT is important for people with disabilities, not only for educational but also for social and personal purposes.

The data show that both countries have the same problems with the education of students with special needs and that they probably have the same financial limitations to meet the necessary conditions. It should be noted that 50% of students (the same number in both countries) do not have a tutor and learning material, which is a serious problem since most students need a tutor.

In terms of equality, the concept of democracy development is to ensure quality education and provide lifelong learning for all children, regardless of their abilities. If we consider the results of this research, we can conclude that poor learning conditions during undergraduate studies for disabled students are also a problem for lifelong learning. For example, they cannot use ICT later easily, they have much bigger problems adapting ICT and using them independently.

The fact that there were no significant differences between Greece and Serbia or any significant differences regarding gender and years of the students, it shows that this is a universal problem and obstacles to the achievement of inclusive education.

This thesis is a pilot comparative study in using ICT in Special Education Needs. In the future studies, we should collect bigger samples with students with different types of disabilities and to classify their problems and the corresponding solution.

7. Conclusions

The aim of this study was to examine if students with special educational needs have adequate learning support using information and communication technologies (ICT). Also, the goal was to examine if there are differences between Greece and Serbia regarding these variables.

The most important barriers to learning that students with special needs are, respectively, the lack of available learning materials, adapted texts, use of ICT tools for attending lectures and lack of special ICT equipment for completing course assignments.

Therefore, for inclusive education to achieve the desired effect, it is necessary to provide special technical conditions at faculties for students with special needs. This includes books with appropriate contrast, printed material Braille script, systems with extra nonverbal information, FM amplification system, special computers in the classroom to maximize the possibilities for activating the curriculum, etc.

It can be concluded that inclusion, has many unresolved problems like not enough available ICT materials, modern tools and appropriate software's. Inclusion is defined here as a process that should help the education of people with special needs. These problems can be solved by the more appropriate use of ICT's, which this research has shown to be of great importance. All problems mentioned above, can be eliminated if teachers and students frequently use ICTs and believe that ICT use is an important tool for learning.

There are some limitations of this study and there is a need for further research on the usability of information and communication technologies (ICT) for the education of people with special needs. The sample size is small since it was conducted on 20 respondents, so it is not possible to generalize the results when comparing the two countries. To have more specific and complete

results, more disabled students and University staff members should be included in another wider cross-country research.

Another limitation is the small number of participating people in this study with different kinds of disabilities. A bigger sample of each separate disability should be considered in order to get the full picture for each disability and the ICT use.

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Appendices

Questionnaire for students with disabilities

If you have a disability, this form is an opportunity to let the University have a better understanding of what help you may need so that we can provide appropriate assistance to facilitate your learning here.

The information collected in this form will be used for the Master's thesis and for statistical purpose. All information collected will be kept confidential and used on a need-to-know basis. After completing the form, please return it back. Thank you for your co-operation.

Date:

Student Name:

Gender:

Year of birth:

Program and Major (Code and Title):

1. What is your disability? (Please select the most suitable description)

- Autism
 - Attention Deficit/Hyperactivity Disorder
 - Color Blind
 - Hearing Impaired
 - Mental Illness
 - Physical Disability
 - Specific Learning Difficulties
 - Speech Impaired
 - Visceral Disability
 - Visually Impaired
 - Others, please specify:
-

2. Do you need special assistance for travelling to the campus?

3. Do you need special arrangements when attending lectures?

4. Do you need assistance or special equipment in your studies and in completing course assignments?

5. Do you need special arrangements for examinations? (Please tick the appropriate box(es))

Taking the examinations in a separate room?

1. YES 2. NO

Allowing extra examination time? :

Providing additional or special equipment:

Allowing rest breaks? (not to be counted in examination time):

Others, please specify:

6. Educational support

- Do students with disabilities have the possibility of having a tutor/ personal assistant to facilitate their learning?
1. YES 2. NO
- Are study materials available in large print, Braille, audiocassettes, diskettes, etc.?
1. YES 2. NO
- DO you adapt texts of educational materials to forms more suited to you?
1. YES 2. NO
- Do you have sign language interpreters or cued speech interpreters?
1. YES 2. NO
- Availability of technical equipment. Tick, if available
 - Computers
 - Braille software
 - Braille printer
 - Perkins Braille's
 - Electronic machines in Braille writing
 - Speech synthesizer
 - Recording devices
 - Dictaphones
 - CD ROM drives
 - Scanners
 - Hearing aids or other, please specify

7. What kind of information and communicate technologies your university have? Please elaborate.

8. Will ICT's help you and facilitate your college work?

9. Have you received appropriate training in the use of ICT's?

10. What you miss in order to keep your tracking complete on classes?

Thank you for your participation!