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“3DDeSI”

Overcoming Disabilities and Enforce Social Inclusion via 3D printing

Project code: 2022-1-EL01-KA220-SCH-000087392

Erasmus+ Call: 2022 - KA220-SCH - Cooperation partnerships in school education

The education system of 3 countries: Opportunities and challenges for inclusion
The integration of technology in general and special needs schools: the case of Greece, Italy and Finland
Working Package 2



Coordinator



Partners



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General Introduction

The deliverable of WP2, as described in the proposal, includes two reports and a repository of good practices. The first report will provide an overview of the education system of the three participating countries, placing special attention on the issue of inclusion. The second report discusses the integration of technology in general and special needs schools with emphasis on the cases of Greece, Italy, and Finland. In order to reach the aims and compile the deliverables of WP2 a systematic and continuous collaboration between partners took place.

In the 1st Transnational meeting, a roundtable was organized, aiming to map the Disabilities (Ds) addressed by the special education school’s students and the Special Cognitive or Academic Difficulties (SCDs/SADs) addressed by the general schools’ students participating in the program. This facilitated the identification of common Ds and SCDs/SADs the project will be focusing on.

After selecting 3 disabilities and 3 SCDs/SADs, we discussed the challenges students face in everyday life, and in the classroom as well as the ways teachers are currently addressing said challenges. Furthermore, distinctions and similarities between the needs of students with SCDs/SADs in primary and secondary special education were discussed. Lastly, we discussed material used in general schools which can serve as a source of inspiration for activities designed in the framework of the Program.

The roundtable discussion familiarized the whole team with the general research subject and the particularities each partner faces. It helped partners find common ground while serving as a source of reference and inspiration for the activities designed in the framework of the Program.

In the 2nd Transnational meeting, the results of the roundtable were presented and briefly discussed (See presentation A). In the same meeting, the Kirkkomännikön koulu and ISA13 schools presented the policy of inclusion of students with special needs in the educational system of their country (See presentations B and C). Furthermore, in the same meeting the E.E.E.EK. Chios presented ideas of activities with the use of technology, and particularly 3D printing that can meet some of the needs of special needs students (See presentation D). This helped the team realize the role of technology towards a more inclusive education.

In the 3rd Transnational meeting, the E.E.E.EK. Chios proposed a categorization of activities with the use of 3D printing that can meet some of the needs of both general and special

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needs school students, paving the way for activities proposed as part of WP3 (See presentation E). Furthermore, the 2nd primary school of Chios and E.E.E.EK. Chios presented an overview of the educational system of Greece, focusing on the distinction between general and special education. The same schools also presented a summary of the strategy of the EU towards an inclusive and accessible Education (See presentation F). Finally, ISA13 presented a preliminary structure of the second deliverable (See presentation G). In the discussion that followed the aforementioned structure, along with the structure of the other WP2 deliverables was further elaborated and cemented.

In what follows, the table of contents for the deliverables is presented:

TASK1/TASK3 The opportunities and challenges for inclusion in the education systems of Greece, Italy, and Finland
1. Introduction
2. European Union Strategy
3. National Education Systems
3.1. National Educational System - GREECE
3.2. National Educational System - ITALY
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4. Case Studies
4.1. Case Study of EEEEEK
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5. Comparison of the three educational systems

TASK 2/ TASK3 "The integration of technology in general and special needs schools: The case of Greece, Italy and Finland"
1. Introduction
2. European Digital Education Policy/Plan
3. National Digital Educational Strategies (strategies, differences primary/secondary, differences between general and special schools)
3.1. National digital educational strategy - GREECE
3.2. National digital educational strategy - ITALY
3.3. National digital educational strategy - FINLAND
4. Integration of technology
4.1 What is the integration of technology
4.2 Who is responsible for the integration (teachers, parents, etc.) and how can it be achieved (software, equipment, application)
5. Conclusion

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The opportunities and challenges for inclusion in the education system of Greece, Italy, and Finland

Preparation of WP2.1

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1. Introduction

Inclusion refers to the practice or policy of providing equal access to opportunities, resources, and benefits to all individuals, regardless of their background, characteristics, or identities. It involves creating environments where all people feel respected, valued, and supported, and where differences are embraced and celebrated rather than discriminated against or ignored.

Inclusion can apply to various contexts, including education, employment, social settings, and communities. It's not just about tolerating diversity, but actively striving to create environments that promote equity and participation for everyone, regardless of race, ethnicity, gender, sexual orientation, disability, socio-economic status, or other factors.

In the context of Education, inclusion refers to the practice of ensuring that all students, regardless of their abilities, background, or identities, are provided with equitable access to Education and are fully supported to succeed academically, socially, and emotionally within the mainstream educational environment.

Key principles of inclusion in Education include Equitable Access, which means that all students should have equal opportunities to participate in and benefit from educational programs, regardless of their differences, and Diverse Learning Needs, which means recognizing and addressing the diverse learning needs of students, including those with disabilities, learning differences, or English language learners, by providing appropriate accommodations, modifications, and support services, moreover include collaboration among educators, parents, and other stakeholders to create inclusive environments that foster belonging, respect, and support for all students, differentiated instruction using various teaching strategies, materials, and assessments to accommodate diverse learning styles, abilities, and interests of students. It also includes Universal Design for Learning (UDL) by applying principles of UDL to design curriculum, instruction, and assessments that are accessible and beneficial to all students, regardless of their background or abilities. Finally positive school climate by Creating a positive and welcoming school culture that values diversity, promotes empathy and understanding, and addresses issues of discrimination, bullying, and exclusion as well as individualized interventions to meet the unique needs of students who require additional assistance to succeed academically or socially.

Inclusive Education aims to break down barriers to learning and create environments where all students feel valued, respected, and supported in reaching their full potential. It recognizes the inherent worth and dignity of every individual and strives to build a more just and inclusive society through Education.

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A disability is a physical, sensory, cognitive, or developmental condition that may limit a person's ability to perform certain tasks, interact with their environment, or participate fully in society in the same way as someone without the condition. Disabilities can be temporary or permanent, mild or severe, and may affect various aspects of a person's life to differing degrees.

Some key points about disabilities are the types of disabilities and their impact on functioning. Disabilities can be classified into different categories, including physical disabilities (e.g., mobility impairments, paralysis), sensory disabilities (e.g., visual or hearing impairments), cognitive disabilities (e.g., intellectual disabilities, learning disorders), and mental health disabilities (e.g., depression, anxiety disorders). Disabilities can affect a person's mobility, communication, cognition, sensory perception, emotional well-being, or other aspects of functioning. The impact may vary widely depending on the type and severity of the disability. Moreover, barriers and challenges are very important. People with disabilities may face various barriers and challenges in accessing education, employment, transportation, healthcare, and other services. These barriers can be physical, architectural, attitudinal, or systemic in nature. In addition, accessibility refers to the design of products, environments, and services in a way that ensures they can be accessed and used by people with disabilities. This includes accommodations such as ramps, Braille signage, captioned videos, and assistive technologies. One more perspective has to do with rights and advocacy. People with disabilities have the right to equal opportunities, inclusion, and participation in society, as enshrined in laws and international conventions such as the Americans with Disabilities Act (ADA) and the United Nations Convention on the Rights of Persons with Disabilities (CRPD). Disability rights advocates work to promote awareness, remove barriers, and advocate for the rights of people with disabilities.

Overall, disabilities are a natural part of the human experience, and understanding, acceptance, and support are essential for fostering inclusion and promoting the well-being of individuals with disabilities.

The involvement of European police in education can take various forms and serve different purposes, depending on the specific context and objectives. A few ways in which European police may interact with Education are, on the one hand, the Crime Prevention Programs and at the other the Safety education. Police agencies in Europe often collaborate with schools and educational institutions to deliver crime prevention programs aimed at students. These programs may cover topics such as drug abuse prevention, cyber safety, bullying prevention, and traffic safety. European police may provide safety education sessions or workshops in schools to educate students about personal safety, emergency

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procedures, and how to respond to various situations, including natural disasters or emergencies.

Moreover, community policing efforts in Europe often include engaging with schools and youth organizations to build positive relationships between law enforcement and young people. This may involve police officers visiting schools to interact with students in a non-enforcement capacity, participate in community events, or mentor at-risk youth.

In addition, European police agencies may run youth outreach programs designed to engage with young people, build trust, and provide support and guidance to those who may be vulnerable to involvement in crime or antisocial behavior. These programs may include mentoring, counseling, or referral to support services.

As well as in some cases, European police may contribute to legal education initiatives in schools by providing information about laws, rights, and responsibilities, as well as promoting civic education and respect for the rule of law. Over and above that due to the increasing prevalence of cybercrime, European police may partner with schools to raise awareness about online safety, cybersecurity, and responsible digital citizenship among students, teachers, and parents.

In general, the involvement of European police in education reflects a broader commitment to community engagement, crime prevention, and youth development, with the aim of fostering safer and more resilient communities.

The European Union (EU) has a comprehensive strategy in the field of education aimed at promoting cooperation among member states, fostering lifelong learning, and enhancing the quality and relevance of education systems. In chapter 2 we will discuss some key elements of the EU strategy in education such as the European Education Area and Erasmus+ Program.

The EU aims to establish a European Education Area by 2025, which will enable citizens to move freely and access high-quality Education and training opportunities across member states. This initiative seeks to remove barriers to learning mobility, promote language learning, and enhance recognition of qualifications and skills. Erasmus+ is the EU's flagship program for education, training, youth, and sport. It provides funding for a wide range of activities, including student and staff mobility, strategic partnerships between educational institutions, capacity-building projects, and policy development initiatives. Erasmus+ aims to promote internationalization, cooperation, and innovation in Education.

Another key element of the EU strategy in Education is digital education. The EU promotes the use of digital technologies in education to improve access, equity, and quality of

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learning. Initiatives such as the Digital Education Action Plan and the European Digital Skills Certificate aim to enhance digital literacy, integrate digital tools into teaching and learning, and support the development of innovative educational practices.

Moreover, the EU focuses on developing key competencies, such as digital, entrepreneurial, and transversal skills, to equip individuals with the knowledge, skills, and attitudes necessary for personal fulfillment, employability, and active citizenship in a rapidly changing world.

Vocational Education and Training (VET) is another perspective. The EU promotes the modernization and quality assurance of vocational education and training systems to address skills mismatches, support labor market integration, and promote lifelong learning. Initiatives such as the European Alliance for Apprenticeships and the European Skills Agenda aim to strengthen cooperation between education providers and employers and enhance the attractiveness and effectiveness of VET.

Additionally, the EU promotes inclusive education policies that ensure equal opportunities for all learners, regardless of their socio-economic background, nationality, gender, or disability. It supports initiatives to address educational inequalities, promote diversity and intercultural dialogue, and provide targeted support for vulnerable learners.

As well, the EU invests in research and innovation in Education to identify emerging trends, develop evidence-based policies, and promote educational excellence and creativity. Initiatives such as Horizon Europe and the European Institute of Innovation and Technology support research collaboration, knowledge exchange, and the development of innovative educational practices.

Overall, the EU's Strategy in Education reflects a commitment to promoting excellence, equity, and social cohesion in education systems across Europe, while also supporting the development of a skilled, adaptable, and inclusive workforce for the future.

Chapter 3 deals with the national educational system. A national educational system refers to the organized structure and framework established by a country to provide formal education to its citizens. It encompasses policies, laws, institutions, curricula, teaching methods, assessment practices, and resources that govern and support the educational process from early childhood through adulthood.

Key components of a national educational system typically include Compulsory Education. Most countries have laws mandating compulsory education for a certain number of years, ensuring that children receive a basic education. Compulsory Education laws specify the age range during which children must attend school.

Moreover, it includes structure and curriculum. The educational system is typically divided into different levels or stages, such as Primary Education, Secondary Education, and Tertiary

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Education. Each level builds upon the previous one and provides progressively more advanced learning opportunities. The curriculum outlines the subjects, content, and learning objectives that students are expected to study at each educational level. It may be determined at the national, regional, or local level and is often guided by educational standards or frameworks.

Schools and Institutions are also included in a national educational system. Educational institutions, such as schools, colleges, and Universities, form the backbone of the educational system. These institutions provide physical spaces, facilities, and resources for teaching and learning activities.

Teachers and Staff are parts of every national educational system. Qualified educators, including teachers, administrators, counselors, and support staff, play a crucial role in delivering education and supporting students' academic, social, and emotional development.

Furthermore, assessment and evaluation, as well as Governance and Regulation with Funding and Resources are important parts of every national educational system. Assessment methods, including exams, tests, projects, and coursework, are used to evaluate students' learning progress, knowledge, and skills. Assessment practices may vary depending on the educational level and the subject area.

The educational system is governed and regulated by national or regional education authorities, Ministries, or departments responsible for setting policies, standards, and guidelines for education provision and ensuring compliance with legal and quality assurance requirements.

Finally, adequate funding and resources, including financial allocations, infrastructure, textbooks, technology, and teaching materials, are essential for maintaining and improving the quality of Education within the national system.

Overall, a national educational system reflects a country's priorities, values, and goals for Education and aims to provide equitable access to high-quality learning opportunities for all citizens, regardless of their background or circumstances. It serves as a cornerstone of social and economic development, promoting individual growth, societal progress, and global competitiveness.

Chapter 3 aims to present the national educational system of Greece, Italy, and Finland from Primary to Higher Education, in order to understand the structure and operation of each

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educational system. The European Union sets the general rules and directives, but each EU country has its own policy and its own way of applying and extending these rules.

In this chapter, reference is made both to the educational system of general education and to special education in those three EU countries, in order to identify the different ways of approaching students with learning or other difficulties, based on the educational system of each of the participating countries.

Chapter 4 presents the cases of three general education schools (one from each of the participating countries) and one special education school in Greece. The aim is to present the operation and organization of each school, but also to identify the difficulties that each school faces.

In the 5th chapter, we attempt to make a comparison of the educational systems of three countries of the European Union, Greece, Italy, and Finland to identify similarities and differences, as far as education and European policy implementation are concerned.

2. Summary of EU Strategy for Rights of People with Disabilities

European Policy

Education policy in the modern globalized society has been linked to concepts such as employability, economic development, and the European dimension. Thus, the Community has developed a policy in the field of Education and vocational training with the aim, on the one hand of mitigating social inequalities and the social exclusion that is the result of exclusion from the educational process, and on the other hand to improve employability indicators and increase the adaptability of European citizens to the demands of the knowledge economy.

Today, the European Commission presents an ambitious strategy on the rights of people with disabilities 2021-2030 to ensure their full participation in society, on an equal basis with other citizens, both in the EU and beyond, according to the Treaty on the Functioning of the European Union and the Charter of Fundamental Rights of the European Union, which enshrine equality and non-discrimination as cornerstones of EU policies. People with disabilities have the right to participate in all areas of life, just like any other person. Although progress has been made in recent decades in terms of access to health care, **education**, employment, leisure activities, and civic participation, many barriers remain. It is time for European action to be strengthened even more.

In all the countries of the European Union, the current trend in special education is the development of a policy of inclusion of students with special educational needs in mainstream schools (European Commission/ Eurydice/ Eurostat, 2003). Co-education (or as it was or is referred to by some researchers as inclusion or integration) refers to all those efforts aimed at the joint study of students with and without special educational needs in the same school context (Zigmond, 2003). Successful inclusive education requires solving specific problems and designing conditions that facilitate adaptation, not just "standard" educational provision. It also requires access to appropriate educational support (human and technical) and adaptation of educational programs to the unique needs of each student.

Additionally, the important role of all involved teachers, but also of the supporting and administrative staff (assistants, sign language interpreters, etc.) is recognized (European Commission/ Eurydice/ Eurostat, 2003). An important contribution to the successful implementation of co-educational programs seems to be the continuous education/training of all involved professionals.

"The current trend in the various **Member States of the European Union** is to include children with special educational needs in mainstream schools by providing teachers with various forms of support in terms of personnel, material and equipment".

Summarizing, we could come to the following conclusions:

- There are three models of co-educational practices in the various countries of Europe (single, double, and multi-track models).
- There is a tendency to create multi-purpose educational centers, the role of the individualized educational program is common to all countries of Europe.
- Legislative arrangements have been reached for the implementation of inclusive education in various countries.
- Each country defines special educational needs differently.
- The way of financing co-educational programs differs between different countries.
- About 2% of the percentage of students with special educational needs in European countries are educated in a separate environment (European Commission, 2000).

About special education in Europe

Diversity is one of the biggest challenges in Europe’s schools and classrooms. Co-education can be organized in a variety of ways and at different levels, but it is the group of teachers who mainly deal with the increasing diversity of students' needs in the school and the classroom and are the ones who should adapt or prepare the curriculum in such a way as to satisfy the needs of all students -those with special educational needs- and their classmates.

Many studies report several categories of factors that are considered effective for **participatory** education. Some of them are highlighted below, mainly in relation to Primary Education:

- Participatory Teaching
- Participatory Learning
- Participatory Problem Solving
- Heterogeneous Grouping
- Effective Teaching Approaches

Also, two factors seem to be particularly relevant to the level of Secondary Education schools:

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- the "Home" System (home area system)
- the Alternative Learning Strategies (Ευρωπαϊκός Φορέας για την Ανάπτυξη της Ειδικής Αγωγής, 2006)

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Moreover:

Participatory Learning: Students who help each other, especially within a system of flexible and defined student grouping, benefit from learning together.

Participatory problem solving: it is about a systematic way of approaching unwanted behavior in the classroom. This involves a set of clear classroom rules, agreed by all students together with appropriate incentives and disincentives for behavior.

The heterogeneous grouping of students: it relates to the implementation of educational settings where students of the same age remain together in classes that include different abilities. The basis for the concept of a multi-ability classroom is the avoidance of choices and respect for the natural diversity of student characteristics.

Effective Teaching: Effective training is based on guidance, assessment, evaluation, and high expectations. Implementing a consistent curriculum for all students is important. However, in some cases, it is necessary to adapt the analytical program not only for students with special educational needs who are at the lowest level but for all students. In relation to students with special educational needs, this approach is determined and shaped in the context of the Individualized Educational Program (IEP).

Alternative Learning Strategies: The application of alternative learning strategies aims to teach students how to learn and how to solve problems. In addition to this, schools give students more responsibility for their own learning.

CONDITIONS OF CO-EDUCATION

There are many prerequisites for co-education. The relevant research literature conducted as well as information from case studies and discussions among experts, demonstrate that several conditions are needed for inclusive education to be successful:

- **Appropriate building** infrastructure
- Positive attitude on the part of the **students** towards the acceptance of diversity
- Teaching **specialization**
- **Educators.** In relation to teachers, it is necessary to: Develop a Positive Teacher Attitude
- Educational needs of students

Definition of special educational needs

Students with disabilities and special educational needs include, in particular, those who present:

1. Mental disability
2. Sensory visual disabilities (blind, amblyopic with low vision), as well as sensory hearing disabilities (deaf, hard of hearing)
3. Motor disabilities
4. Chronic incurable diseases
5. Speech disorders
6. Specific learning difficulties (such as dyslexia, dysgraphia, dyscalculia, dyslexia, or dispelling)
7. Attention deficit syndrome, with or without hyperactivity
8. Pervasive developmental disorders (autism spectrum)
9. Mental disorders and multiple disabilities
10. Students with complex cognitive, emotional, and social difficulties, delinquent behavior due to abuse, parental neglect and abandonment or due to domestic violence, belong to people with special educational needs
11. Students with special educational needs are also students who have one or more mental abilities and talents developed to a degree that far exceeds what is expected for their age group

The category of students with disabilities and special educational needs does not include students with low school performance that is causally linked to external factors, such as linguistic or cultural peculiarities.

Definition of a group of students with disabilities

- Sensory visual impairments (blind, amblyopic with low vision)
- Sensory hearing disabilities (deaf, hard of hearing)
- Motor disabilities – chronic incurable diseases
- Attention deficit syndrome, with or without hyperactivity
- Pervasive Developmental Disorder (autism spectrum)
- Speech-language disorders
- Learning Difficulties
- Mental deficiency/immaturity
- Complex cognitive emotional and social difficulties
- DOWN syndrome

Definitions and categories In Europe

Definitions and categories of special needs and disability vary between countries. Some countries only define one or two types of special needs. Others classify students with special needs into more than ten categories. Most countries classify six to ten types of special needs.

Provision for pupils with special needs: Quantitative indicators are complex in the field of special education and inclusion. The percentage of registered pupils who have special needs varies significantly between countries. Some countries record about 1% of all students, others record more than 10%. These differences in enrollment rates between countries reflect differences in assessment procedures, funding arrangements, and provision.

Taking all countries together, around 2.1% of all pupils in Europe are educated in special schools or special classes (full-time).

Special schools: the conversion of special schools and institutes into resource centers is a very common trend in Europe. Almost all countries report that they are planning to develop, are developing, or have already developed a network of resource centers in their country. This situation has important consequences for Special Education.

In short, special education must be transformed from a student-centered educational institute to a support structure or resource center for teachers, parents, and others.

Additional issues: Most countries use individualized education programs for students with special needs. It appears from the descriptions of the countries that, in almost all countries, the development of individualized educational programs plays an important role in Special Education in the context of general education. It serves both as an expression and determination of the degree and type of adaptation of the comprehensive educational program and as a tool for evaluating the progress of students with special needs. It can also

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be used as a 'contract' between the various stakeholders: parents, teachers and other professionals.

Chronology

It is worth trying to look back at the history of the development of Special Education and then, easily point out that it has characteristics of the development of a subsystem on the fringes of Education. We shouldn't forget that the way society deals with children and their Education is usually indicative of its level of development.

The periods-stations for Special Education internationally could be summarized in three stages:

- a) the rejection and maltreatment stage
- b) the stage of pity, care, and separate education
- c) the stage of claiming equal educational opportunities and co-education

Around 1960, the disability movement began to develop in many countries. Thus, their representation is undertaken by the people with special needs themselves, displacing their charitable representation by competent "friends". Parents' organizations also make their presence more intense and assertive.

Charitable and welfare institutions and schools are the only ones that "treat" children with special needs. The Medical Model dominates at a social and educational level.

In the following decades of the 1970s and 1980s in the USA and in many European countries the inclusion of students with special needs in ordinary schools is guaranteed by law. The Education of these students becomes compulsory from infancy.

The Education of people with Special educational Needs becomes compulsory from infancy. Terminology (negative labels) changes along with mindset and social attitudes. In the USA and many European countries, the inclusion of students with special needs in ordinary schools is guaranteed by law. Alternative integration models are being developed and there is intense research activity in the evaluation of these models. Local support services are being created.

Educators in the USA and other countries are required by law to draw up an individual educational program for each child. The participation of parents in their children's programs is necessary, active, and legally protected. The European Union places special emphasis on integration, both educational and social, and has funds for the implementation of programs (e.g. **HELIOS** programs) and research in the member states.

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Large funds are available for research and development in the field of assistive technology. Computers open new perspectives for the education of students with special needs. Teacher training in Special Education is provided at postgraduate level in many countries. General Education teachers are beginning to join training programs for the education of students with special needs. The continuous training of teachers is considered a necessary condition for the success of Special Education Programs (Παντελιάδου Σ., 2005).

Nowadays, the dominant trend is integration, so teachers are obliged by law to draw up an individual educational program for each child. The participation of parents in their children's programs is necessary, active and legally protected. The goal of Special Education can no longer be rehabilitation by intervening in the individual, while the role of the ordinary school remains the same! Thus, emphasis is placed on changing the school and adapting it to the student's needs by providing special means, materials, techniques and appropriate teaching. Efforts for joint education of students with and without special educational needs they start as early as the 1970s and mainly concern the co-education of students with mild cognitive deficits. This movement was "strengthened and legislation and decisions, such as US Law 94-142/1975, the petition of the WARNOCK Commission (1978) and the Education Act 1983 in Britain, and decision of the Council of Ministers of Education of the Member States of Europe (4-6- 1984) for school integration" (Τριλιανός, 1992).

Specifically, the European Council, proposed in 1987 a "cooperation program for the inclusion of disadvantaged children in regular schools" (p.1), because the indications that there were (the conclusions drawn) from integration programs for children with special needs since it began to be implemented based on the Council Resolution on 1984, "affirm the importance of the greatest possible inclusion of the disadvantaged of children in regular schools" (Επίσημη Εφημερίδα των Ευρωπαϊκών Κοινοτήτων, 1987).

As Tsinarelis (1993, 21) points out, "the 1980s were perhaps the more decisive for the institution of integration in the countries of Europe and especially in the countries of the European community. The one-school-for-all trend is now mainstream policy axis in the field of education." The educational policy, both in United Kingdom, as well as in the United States, which supported the principle to include as many children with special educational needs as possible in ordinary schools, influenced the policy for the education of pupils with special educational needs of many countries, in the same direction (Hornby, 1999).

Another station in the direction of co-education was the World Conference on the Education of children with special needs, which took place in Salamanca, Spain in 1994 (Ainscow, 1995 & 1999).

The conclusions of the conference, which influenced the policy of many countries, referred to the following:

1. Every child has the basic right to education.

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2. Each child has unique characteristics, interests, abilities and learning needs.
3. These differences should be taken into account when providing educational services, characteristics, and needs.
4. Children with special educational needs must have access to the ordinary school, the policy of integration in schools is the most effective in dealing with the segregation and exclusion of children with special needs from ordinary education processes.

The philosophy of schools that implement inclusive education programs for students with and without special educational needs, must focus on the recognition of students' needs and above all in satisfying these needs. In addition, schools and classroom teachers must adapt to the different rhythms and learning styles of children, to ensure its quality curriculum, and have the appropriate supervisory means, as well as the corresponding infrastructure and equipment (Soler, 1996).

In the Western World, at least, this trend of co-education of children with special educational needs, is, according to the reflection of the following two basic beliefs (principles) (Mitchell, 1990):

- The first, which is also based on research data, claims that both children with special educational needs and those without special needs can benefit from a closer cooperation and symbiosis between them.
- The second, which is more moral of a social nature, and prevails in most countries, is based on the principle that children with special educational needs have the right to be educated alongside their classmates without special educational needs. In addition, the organizations of parents of children with special educational needs played an important role in shaping these perceptions, and they lobbied for a fairer treatment of their children (Ballard, 1998).

Policies and practices in Europe

What are the common trends in Europe? Has progress been made on the issue of Special Education? What are the main challenges for the future? The most important developments in European countries in the last ten years are listed below.

Trends and progress

1. There is a trend where countries with a clear two-wheeled Special Education system (relatively broad special education system alongside general education) are developing a continuum of services between the two systems. Furthermore, special schools are increasingly defined as centers of educational materials and applications for mainstream schools.
2. Legislative progress on Inclusive Education has been achieved in many countries. This is especially true for countries that have a broad Special Education system, where they have developed a new legislative framework that addresses SEN within the mainstream school.
3. Some countries have planned to change the funding system to achieve more integration services. In other countries, there is a growing awareness of the importance of an adequate financial system.
4. Parental choice has been an important issue in some countries in recent years. An attempt has been made to achieve a more inclusive solution through an increasing number of possibilities given to parents to choose the educational institution for their child.
5. The transformation of special schools into resource centers continues in most countries. In some other countries, this conversion is starting now.
6. The role of the individualized educational program in the practice of Special Education is a common trend in European countries. Progress has been made on this issue.
7. Countries are trying to move from the psycho-medical paradigm to a more educationally oriented or interactional paradigm. However, for now, this is mainly done at the level of changing concepts and opinions. The application of these new perspectives in Special Education practice still needs to be developed.

At the international level, the targets of combating discrimination and promoting rights and equal opportunities for people with disabilities, are directly related to the terms of the

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United Nations Convention on the Rights of Persons with Disabilities (2006). Under the contract, the contracting members must adopt all appropriate measures for the implementation of rights. These rights of individuals with disabilities refer to an equal participation in education, work, and health, in satisfactory level and living conditions, aiming their equal acceptance and integration into the community (EYΣEKT, 2021).

Specifically, the principles formulated to:

1. Respect the people with disabilities for inherent dignity, including individual autonomy.
2. Allow the freedom to make one's own choices.
3. Ensure non-discrimination.
4. Achieve full and effective participation and inclusion in society.
5. Respect for diversity and accept people with disabilities as part of the community.
6. Ensure the equality of opportunities.
7. Achieve better accessibility.
8. Ensure equality between men and women.
9. Respect for the evolving capabilities of children with disabilities and respect for their rights to maintain their identity.

The issue of the Education of people with special needs is raised in Article 24, where the Convention calls on the Member States to commit to the recognition of equal value Education of the disabled without discrimination, at all levels with the ultimate goal of integration. To achieve this, the member states guarantee the possibility of access of children with disabilities to General Education with individualized support for each person with the most appropriate teaching methods for each deficit case. At the same time, they are responsible for ensuring smooth and healthy social integration of children with disabilities, not only in the educational system but also in the wider social context. Except for the special educational staff that is required for the application of these practices, it's necessary the appropriate infrastructure for the access of children with disabilities in school units and every social activity.

For the practical protection of the rights of people with disabilities, as well as of equality in their entry into professional life, a committee of ministers was set up for the plan action REC. This action plan aims to combat discrimination in their participation in all levels of

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public and political life, in cultural social events, in professional training and employment, in media transportation, information and communication, healthy living in its context community, and care of them, Education and social awareness about the abolition of discrimination for the disabled.

Regarding Education, the REC action plan entrusts the UN member-states the responsibility for creating legislation regarding the Education of the disabled, which will ensure all persons with disabilities, regardless of their type and degree deficit, equal access to Education. In addition, it will aim to an all-round development of personality, creativity, and special children's abilities through Education. According to this action, the governments should ensure that there are adequate provisions in General Education so that children with disabilities can join it. Finally, the Member States should promote Lifelong Education and training for all people with special needs and help promote respect and protection of the rights of the disabled from the wider society.

The Council of Europe is an institution made up of 43 European states, which participate in making important decisions and establishing an audience European social charter, signed in 1961. This charter attempts, among other issues and rights, to raise the issue of disability, giving a first definition of which people are called disabled, thus speaking of impaired physical or mental abilities, whether born or acquired during life, which render the individual unable to fulfill his needs for a normal individual and social life.

Due to the efforts that have been made in the last two decades, in the European framework, for the strengthening of people with special needs and their protection, 2003 was declared the "European Year of the Disabled Needs". Driven by this fact, the European Commission decided the implementation of an action plan from 2004 to 2010, with the aim of economic and social integration of people with disabilities, through individual actions. The areas that the specific action plan focuses on are access to employment and maintenance in active life, Lifelong Education and training, its utilization potential of new technologies, and accessibility to the public infrastructure environment. Concerning Lifelong Education and training, the question of technology arises as an auxiliary factor in the Education of people with disabilities, as well as the use of technology and communication (ICT) programs, will give all disabled people needs to have access to e-learning platforms for their training when this is necessary (Τόγια Α. & Κοπέτση Ε., 2018).

According to the European Pillar of Social Rights (2017) which has the aim to make a fairer Europe, offering more opportunities for everyone, sets up some principles. People with disabilities have the right to income support that ensures a decent living and a work environment adapted to their needs. Moreover, every person has the right to quality and inclusive Education in order to sustain and acquire skills that will enable him to participate fully in society and to manage successful changes in the labor market. Everyone has the right to affordable, good quality long-term care services, and in particular home care services and

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services at the community level. Children have the right to have affordable and good quality early childhood education and care, protection from poverty, and special measures to strengthen equal opportunities for children from disadvantaged backgrounds (ΕΥΣΕΚΤ, 2021).

In its first steps, the European policy approach to disability was based on the Medical Model of disability, according to which the problems of disability are a result of physical or mental dysfunction that individuals have and are not related to the environment in which they live. In 1993, when the Maastricht Treaty establishing the European Union entered into force, there were several minor and conflicting directions of the European political Community, aimed at the group of people with disabilities, but there was no relevant reference to legislative texts.

For this reason, it was difficult for the Community to develop any disability policy, and the initiatives taken were not binding or took the form of action programs. The main objectives of these programs were to promote the exchange of information and good practices and contribute to the development of a broader disability policy. The action programs were from 1974 to 1996 a pillar of European disability policy, which shows how limited they were the legislative competencies of the Community in this direction. The original list of 19 protected rights was renewed with the Supplement 1988 Protocol with four more rights inspired by its social legislation European Community (the right to equal opportunities and equal treatment in employment and work without gender discrimination, the right to information and consultation, the right participation in defining and improving working conditions and the right of the elderly in social welfare). The Charter was also renewed by the 1991 Amending Protocol and the 1995 Supplementary Protocol.

The disabled organizations with the status of partner are the European Disability Forum, the intellectual disability organization Inclusion Europe, autism organization Autism Europe, the International Hydrocephalus and Spina Bifida Federation and the organization for mental disorders Mental Health Europe, the organization for intellectual disability Mental Disability Advocacy Center, the International Federation of Persons with Disabilities, the international organization Disabled People's International, the organization Rehabilitation International, the European Union of the Blind, the European Union of the Deaf and the organization European Action of the Disabled. On 3 May 1996, the European Social Charter was renewed to cover a wider number of issues, such as the right to protection of employees in cases of termination of work or bankruptcy of the employer, the right to dignity at work, the right combination of professional and family responsibilities, the protection of their representatives, the right to protection from poverty and social exclusion and the right to housing (“Ε.Σ.Α.μΕΑ.”, 2008).

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Social protection and welfare systems vary from one EU member state to another. The differences are found mainly in the way they are organized, as well as in their financing methods, reflecting the cultural, historical, and institutional differences that exist. However, in all European countries, an attempt is made to provide general protection and support to all those in need, either temporarily, or for long periods of time, for example in the case of disability (Λεπίδα, χ.χ.).

For a school system to be considered to be of good quality, all its students must feel welcome, diversity and management flexibility are considered important components for the personal development of all students, Education should be inclusive by design, students' obstacles should be addressed and the difficulties that students may arise must be shaped and managed by the school context. Transforming the General School into a school for all students means transforming Pedagogy so that it can respond positively to student diversity. It also means a change in School Culture and the culture of school classrooms (Ημέλλου, 2017).

Erasmus Mundus is a European program which was done in two phases. The first started in 2004 and was completed in 2008. The second as a continuation of the first phase, started in January of 2009 and was completed in 2013. The Program aims to improve improvement of the Quality of Education, through cooperation between Europe and other countries, as well as the exchange of populations among Educational Institutions of all levels.

One of the primary objectives of the Program is the cooperation between Educational Institutions with the ultimate goal of improving the quality of overall Education inside and outside the EU. In addition, the program aims to make the European Union a global center of learning, promoting intercultural tolerance and understanding, developing abilities and skills useful for the citizens and the development of their social life, and finally enabling nationals of other countries to obtain pro-entry into European Higher Education. Specifically, the Program seeks through the benefits the promotion of diversity and the essential combating all discrimination. At the same time, it aims at equal access for all learners with and without learning disabilities and knowledge, making particular use of the use of Information Technologies and Communication.

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The urgent need for the modernization of the Educational System led to the creation of the e-Learning program, its implementation which is distance education through the use of digital and online technologies. Specifically, through distance education autonomy is achieved in the pace of learning using an interactive environment, lower cost, and easier access to Education. Therefore, intending to improve the quality of the educational process, the e-Learning program aims to the promotion of Lifelong Learning under the dimension of equal participation of all citizens in it. According to reports compiled by various European countries, the evaluation of the program showed that there are many advantages in its implementation, such as an increase in the level of digital literacy of fusion, development of cooperation between the states and their counterpart Educational Institutions, short-term qualitative change in curricula in teaching and learning in general. Also, there has been a significant impact on combat and countermeasures of socio-economic inequalities within society.

Similar in terms of the design and targeting of the program e-Learning can also be considered the Netd@ys Europe program, which was designed to provide the required skills for the promotion of the use of new technologies in the fields of education, training, and culture. Netd@ys Europe actions are placed dates from 1997 to 2005 and were carried out throughout Europe. In their context, student projects were implemented with the main feature of using technology, so that it becomes educational process more attractive and efficient.

The Lifelong Learning Program was designed with the aim of quality upgrading of Education and the elimination of inequalities in access to it, at the expense of citizens who belong to socially vulnerable groups, including people with disabilities. At the same time, the goal of the program was to turn European Education into a universal quality reference point, leading to the creation of more jobs, economic growth, and the creation of conditions for stronger social cohesion. The program supports a variety of actions that aim, among other things, to all in the promotion of creativity, competitiveness, and the development of the entrepreneurial spirit, promote language diversity and language learning, improve the quality and the ability to access the opportunities of a lifetime of learning (Σούλης Σ., 2013).

The "Child Guarantee" policy is inextricably linked to its issues of disability. In particular, children with disabilities and special needs, including children with disabilities who live in institutions and closed structures, are one of the 4 main groups of the Child Guarantee policy. Also, children from families with parents who need support (parents with serious illnesses, mentally ill, bedridden, disabled, etc.) are one of the groups of children with "increased risk" for poverty and social exclusion.

The above policy basically started with the Recommendation of the Commission of 2013 "Investment in children: Breaking the cycle of disadvantage" (recommendation 2013/112/EU of 20/2/2013), which recommended that Member-States implement policies that will

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promote the well-being of children, through multidimensional strategies that will ensure access to adequate resources, affordable quality services and the right to participate.

Following the initiative of the European Parliament in 2015, which called the European Commission and the Member-States to explore the possibility of establishing a framework European Child Guarantee, the Commission prepared a relevant European study feasibility study (Feasibility Study for a Child Guarantee. Final Report, March 2020) and typed (March 2021) Proposal for a Council Recommendation establishing European Child Guarantee, to establish a European framework policy, according to which Member-States will ensure multi-annual national strategies. For the implementation of the strategies, National Action Plans should be drawn up, to Guarantee for Children.

Inclusive Education is part of both the Child Guarantee policy and part of the aforementioned Common European Guidelines for deinstitutionalization. As for the latter, it is a basic preventive measure to avoid institutionalization, the elimination of institutional care feedback, and the promotion of independent living. Reference is also made to the implementation of actions for children's access to conventional (mainstream) Education, such as personal help or teachers for children with difficulties, the adaptation of the school environment, the provision of specialist equipment as well as the formation of special customized teaching programs.

The UN Convention on the Rights of the Child, in articles 28 and 29, enshrines it right of access of every child to appropriate and quality education, without discrimination and on the basis of equal opportunities, defining the concept of quality with institutionalization specific educational goals. Education must favor the overall development of personality and the abilities of each child individually, to be adapted to the individual needs. Every child has the right to Education and participation without discrimination (EYΣEKT, 2021).

Common trends and differences In European practice for Special Education and Education

Points of convergence of inclusive education policies in European countries depending on the co-education policy they follow, can be classified into three categories (Ευρωπαϊκός Φορέας Ειδικής Αγωγής, 2003):

a) The first category includes countries that develop policy and practice application that aims to include almost all students in general education (**one-track approach**). It's called a one-way class. This policy is supported by a wide range of services centered on the General Education school. This approach is found in Spain, Greece, Italy, Portugal, Sweden, Iceland, Norway and Cyprus.

b) In the second category there are two separate educational systems (**two-track approach**) (dual path category). Students with special educational needs usually attend special schools or special classes. In general, the vast majority of students who are officially registered as having special educational needs don't follow the general syllabus of the school. These two systems have (or at least they had until recently) separate legislation, with different laws for each one. In Switzerland and Belgium Special Education is quite well developed and usually implemented separately, in a well-organized system of special schools that are supported by a correspondingly organized network of medical educational centers.

c) The countries belonging to the third category have a multiplicity of approaches concerning inclusion (**multi-track approach**). They offer a variety of services and options between the two systems (general systems education and special education). These services range from multiple special classes (full or part-time) to various forms of intra-school cooperation, including exchange activities (where teachers and students from general education and special schools organize limited-time exchanges) (Ευρωπαϊκή Επιτροπή για την Ανάπτυξη της Ειδικής Αγωγής, 2003). Denmark, France, Ireland, Luxembourg, Austria, Hungary, Poland, Finland, United Kingdom, Latvia, Liechtenstein, Czech Republic, Estonia, Lithuania, Poland, Slovakia, and Slovenia belong to this category. Countries with a dual-track system tend to adopt a multi-route approach (for example, Germany and the Netherlands, while belonging to a dual-track system, are moved to the multi-track system). In these countries, there is an increasing number of structures between general and special education lawsuits.

The countries that belong to the single-route and multi-route categories approaches lead to the transformation of several special schools into multi-power centers (educational material and application centers - resource centers). In all countries, the individualized education program plays a key role in co-education. Also, all "countries are trying to move from a psycho-medical paradigm to a more educationally oriented or interactional paradigm. However, for now, this is mainly done at the level of changing concepts and opinions. The

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application of these new views in the practice of Special Education still needs to be developed" (Ευρωπαϊκή Επιτροπή για την Ανάπτυξη της Ειδικής Αγωγής, 2003).

Points of divergence of inclusive education practices between different countries

Countries vary considerably in terms of the stage of policy development co-education they apply. Sweden, Denmark, Italy, and Norway are countries that have implemented inclusive education policies and enacted legislative arrangements for several years. In the rest of the countries, some have become legislative changes and are mainly concerned with:

- the right of parents to choose their child's educational framework (Austria, Netherlands, United Kingdom, Lithuania).
- regulations in financing matters (Netherlands and Switzerland)
- legislation regarding special education in secondary education (Netherlands, Austria, Spain) (Ευρωπαϊκός Φορέας για την Ανάπτυξη της Ειδικής Αγωγής, 2005).

Differences are observed between the various countries, as well as in terms of their definition of special educational categories. For example, in Denmark, only two types are defined as educational needs, while in Poland they classify students with special needs educational needs in more than 10 categories. Those different definitions affect each country's administrative, financial, and legislative procedures (Ευρωπαϊκός Φορέας Ειδικής Αγωγής, 2003).

In the table below (Table 1) we can see the percentage of students with special needs educational needs that attend in a separate educational context (special school or integration department in the various countries. Thus, we observe that the countries of Northwest Europe choose more segregated forms of Education for students with special needs educational needs, than the countries of southern Europe and Scandinavia.

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Table 1: Percentage of students with special educational needs who are trained in separate structures

< 1%	1–2%	2–4%	> 4%
	Austria	Belgium (DE)	
Cyprus	Denmark	Estonia	Belgium (C)
Greece	Ireland	Finland	Belgium (FL)
Iceland	Liechtenstein	France	Democracy
Italy	Lithuania	Hungary	Czech Republic
Norway	Luxembourg	Latvia	Germany
Portugal	Netherlands	Poland	Switzerland
Spain	Sweden	Slovakia	
	UK		

Source: (Ευρωπαϊκός Φορέας Ειδικής Αγωγής, 2003)

Also, the way co-educational programs are financed varies between different countries. In some countries, funding is not determined based on the student but based on the educational institution in which he attends. This means that the referral to special schools is chosen as the best educational practice where specialist professionals will undertake the student's training. In this way, clearly, segregation is reinforced where special education is the best alternative solution because it has all the required services and the extra help it needs the student (Eurybase, 2005).

Finally, the teacher himself/herself and the role he/she assumes in co-education varies between different countries. A distinction concerns the countries where the support comes from a teacher who belongs to the school staff and in countries where support is provided by a specialist professional outside the school (Ευρωπαϊκός Φορέας Ειδικής Αγωγής, 2003).

Children and young people with special needs continue to be one of the most marginalized groups in society. Due to their difficulties, they face social discrimination, thus reducing their professional opportunities and mainly entrenching their educational experiences. The aim is to create an appropriate framework that will not reject these people but will offer opportunities for equal participation, without violating any of their Human Rights. This action is based on two levels; society and school, which constantly interact with each other (Hegarty Seamus, 2002).

The role of Special Education is to create specially designed teaching for people who present special educational needs. Its purpose is to limit the problems that they face every day and the equal participation in the activities of the school community. The range of Special Educational needs is quite large, which is why it became necessary to establish various

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applications to alleviate the problems of these children. The course of development of Special Education begins with the institutionalization or asylum of people with serious problems, and then the principle of educability of children with special needs is introduced, which aims at partial or total participation in Education. The next stage is normalization which refers to the integration of children with special needs in the standard school and the children living with their families. The newest strategy of integration and inclusion promotes special schools or special classes or parallel teaching support departments co-located in general schools. Finally, a new dynamic in the school space comes to revise everything that had been formed. The principle of inclusion or total education reshapes the current situation. It aims to improve the quality of education of children with special needs and their learning outcomes.

It is a practice that does not support the separation of these students from the rest of the students but supports active participation in school activities. It responds to the needs of individual students and implements a unified curriculum plan that addresses the entire student body. Therefore, it is a supportive practice that helps children with special educational needs to integrate smoothly into the school community and ultimately into society. Their particularities are not an obstacle, as long as all people have inviolable rights to education, dignity, solidarity, and social recognition (Στασινός, Δ., 2020)

The advantages of Inclusive Education for students with special educational needs as argued by teachers refer to both their cognitive and social skills. It has been noted, that increasing their interaction with their peers, improving their performance on weighted criteria, and strengthening their social and communication. In addition, inclusion provides emotional benefits and empowers students with special needs. the sense of "belonging", which is a basic condition for learning (Shaffner, 2004).

According to Jones (2002), it is argued that the implementation of inclusive education enhances the intellectual and social development of all students, with or without special needs, as it strengthens the feeling that everyone is part of and participates equally in the school community. Students with special educational needs obtain more social benefits in the school that promotes the principle of Inclusive Education compared to the Special Education Schools. They are offered more opportunities for social interaction with other children and acquire more social contacts than in the special school. They develop positive interpersonal relationships and friendships with their classmates with or without special needs (Jones, 2002).

Inclusion in Education

Inclusion as a challenge

Diversity is one of the biggest challenges in schools and classrooms in Europe. Co-education can be organized in a variety of ways and at different levels, but the group of teachers is the one that mainly deals with it increasing diversity of student needs at the school and class and they should adapt or prepare the teaching in such a way that meets the needs of all students -those with special needs educational needs- and of their classmates (Ευρωπαϊκός Φορέας για την Ανάπτυξη της Ειδικής Αγωγής, 2006).

Inclusion is the Education of all students regardless of whether they have special educational needs or not. The main milestone of inclusion is the equality of all students towards learning and education as well as the management of otherness in the classroom based on the appropriate respect for diversity, acceptance, and social recognition (Oliver, 2018).

Inclusion needs to respect certain conditions. Analytically, in the school area, special structures are needed to facilitate the access of all students. In the school classroom, inclusion sets as basic conditions that teachers take seriously the needs, interests, and peculiarities of students with special educational needs, which are served by the arrangement of the desks, the eye contact with the teacher, the uninterrupted interaction during the appropriation of the learning object in the teaching practice and also the cultivation of social skills in work groups that promote acceptance and recognition by other students (Austin, 2015).

It is a necessary condition that students with educational needs should be equal with those without special educational needs and that the interaction between them is promoted through group identity and the spirit of collegiality in group activities. In addition, innovative technology is a necessary condition for the flexibility of all students in the process of adapting to the new school conditions with what they require: healthy inclusion, harmonious coexistence with others, easy adaptation, receptivity, and acceptance (Avramidi E., 2012).

Inclusion schools are designed in such a way that the needs of all students are served to the best possible extent and there are structures in them that favor the access of all students. Inclusive education has equality as its main milestone. Through inclusive education, students develop their abilities. They cultivate their social skills through work groups since they are in constant interaction with their classmates, the teacher, and the knowledge (Kourkoutas, 2017).

Through inclusion, positive behaviors are encouraged, and efforts for academic success but also acceptance of diversity through cooperation in the classroom and at school are

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rewarded. According to research on inclusion and inclusive education, the detailed curriculum of General Education is followed and adapted based on the needs and particularities of each student. Through inclusion, racist tendencies, and moods, stereotypical perceptions and prejudices about diversity are deconstructed, and the acceptance and recognition of human value are promoted, whether it refers to cultural identity or some form of disability and other difficulties (Στασινού, 2013).

Inclusive Education is a big challenge for the teacher and the school context. Through observation and recording of behaviors, he/she needs to evaluate the progress and development of the child in the classroom. It is called to manage diversity based on equality but also to meet the needs of all students (Βοζίκη, 2011). He has to deal with students with different needs and peculiarities, students with different clinical profiles, and students with different interests. It needs to readjust the intervention program and the curriculum, it needs to readjust learning strategies and methods, to bring all students to the same or almost the same level to create new learning motivations that will attract their interests and improve the school performance or will enhance their sociability. The teacher, if a diagnosis has already been made, takes seriously the evaluation report from the special centers and monitors the progress of each child. The duties of the teacher include among other things assessing the student's progress, identifying learning needs and weaknesses, covering the child's learning gaps, creating learning motivation, and promoting the smooth flow of the lesson, even though he has to manage a heterogeneous class (Ζησιμόπουλου, 2011).

The philosophy of Inclusive Education differentiates the role of the teacher who needs to be informed about the peculiarities but also the possibilities of the student with special educational needs. Therefore, they are the ones who have the ability to detect any difficulty or specificity, report it to the parents and the school director, and ultimately undertake, through intervention programs, the positive development of the student (Σαλβαρά, 2011).

In the context of inclusion, the cooperation of the general education teacher and the special educator who usually offers parallel support and also with the child's family is very important. It is natural that many times the difficulties bring tension and problems, however the common goal for the child which is his improvement both on an individual and a group level, can remove any difficulty. The constructive cooperation between the school and the family, aimed at the child and his positive development in the classroom and at school, is a priority and that is where both of these factors need to focus (Αγγελίδη, 2019).

The heterogeneity is a real obstacle to the smooth conduct of the teaching work as the teaching flow needs to be adapted each time to the needs of all students, whether with special educational needs or not. The teacher knows that in his class he has a student or students who belong to the spectrum of special education, for this reason, he mobilizes all his mental powers, knowledge, and experiences to respond sufficiently satisfactorily to this great challenge that he is called upon to face every day (Artiles, 2011) (Booth, 2016).

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Practices of Inclusion in Education

Learning is a complex psychological process that aims at the full participation of students to acquire the necessary knowledge and skills. According to Vygotsky and his theory regarding the Zone of Imminent Development, students can, under the supervision and guidance of the teacher, master a higher level of development, which due to its difficulty, alone would not succeed effectively. In the context of Special Education and the strategy of inclusion, the idea of the Zone of Imminent Development acts as a complement to this whole process. The children actively participate in the learning teaching, as a result of which the child's thinking is not simulated with that of the teacher. The lesson is shaped according to the student's intelligence level and through multiple examples, their thinking is guided. During the learning process, they acquire a more active participation role, mastering knowledge more effectively and completing exercises of higher difficulty than their level of knowledge.

The goal of inclusion is to create an environment as non-restrictive as possible for students who face a variety of learning and behavioral difficulties so that they can integrate more smoothly and effectively into school life. By designing a learning program tailored to the needs of these children and providing appropriate teacher guidance and assistance, great learning outcomes will be achieved. Proper planning, appropriate training of teachers, and their collaboration with experts will bring about the desired results (Στασινόγ Δ., 2020) (Η.Π.Α, 2006).

The basic implementation practices of Inclusive Education of children with and without special needs can be easily implemented with the appropriate modifications. These practices are: a) the learning community, b) adapted learning environments, c) success for all, d) beginning and advanced learners, e) the classroom within the classroom, and f) the 20/20 analysis: pedagogical assessment and teaching planning tool.

The basic implementation practices of Inclusive Education of children with and without special needs, which are mainly applied abroad, are of particular importance. The learning society is addressed to all students regardless of age and class and promotes the cooperation of the parent and the special educational staff in the application of modern teaching methods, with the aim of providing the Education of all students under the best conditions. Initially, the student's educational needs are assessed based on his/her age and class. Then follows the design of the new program, in collaboration with the educational staff, and finally its implementation. At the same time, the responsibilities of the special staff and the limits of parents' involvement are defined.

Adapted learning environments are aimed at Kindergarten and Elementary School students. The purpose of this program is the best and harmonious education for students with and without special needs. To make this possible, certain procedures are followed such as the

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spiral arrangement of the material, the individual progress plans for each student, the readjustment of teaching methods, continuous evaluation and feedback (Σούλης Σ., 2008).

The "success for all" program aims for all students to attend mainstream school. It provides for early intervention to address problems and develop students' reading and writing skills, while for students with more severe problems, additional individualization is provided through instruction outside the classroom for a certain time (Fashola, 1997).

At the same time, the "beginners and advanced students" program has many points in common with the "success for all" program. The most important of these is the purpose of the program. It refers to students with a high failure rate from preschool through the last grade of elementary school. It aims initially at the development of skills, mental and cognitive abilities, and school performance, at reading and writing, and at a second level at learning social skills, cultivating critical thinking, and the ability to solve problems (Slavin, 2000).

Also, the "classroom within the classroom" program refers to the co-teaching of the general education teacher with the special education teacher, to cover the special educational needs of the students attending the general class (Connor, 2006). The purpose of this program is to provide equal learning opportunities with common and effective co-education of students with and without special educational needs. However, the task of the special education teacher is to teach the material adapted to the particularities of students with special needs (Σούλης Σ., 2008).

Finally, the "20/20 analysis" program is a tool for pedagogical evaluation and teaching planning, it aims to identify gifted students and those with learning problems, to prevent their exclusion from general education. General and special education teachers participate equally in this program (Sharpe, 2001). Specifically, an attempt is made to identify the 20% of students with the lowest and highest school performance in a class through various weighted tests or informal assessment tools. Then, information about each student's strengths and weaknesses is systematically collected and evaluated. Teaching goals are redefined, alternative teaching methods are designed and changes are made in teaching methods and supervisory tools (Σούλης Σ., 2008).

European Funding – Programs

The financing of Special Education Financial resources is an essential element of inclusion. If a country promotes inclusive education, the legislation and in particular the funding rules must be adapted to this purpose. If these rules do not follow the specific objectives, then the chances of achieving the objectives are very small. In this sense, funding is a decisive factor in achieving integration. The country's descriptions clearly show that the financial system can hinder the inclusive education/integration process.

Financial resources are an essential element of integration. If a country promotes co-education, the legislation and especially the financial rules must be adapted to this purpose. If these rules do not follow the specific objectives, then the chances of achieving the objectives are very small. In this sense, funding is the decisive factor in achieving integration. The descriptions of the countries show clearly that the financial system can hinder the process of co-education/integration. In some countries, funding is not linked to students but to educational institutions that the students attend. In practice, this means that the referral to special schools is rewarded. Detaining students with special needs in general schools or referring them from special schools to general schools is not sufficiently encouraged. Therefore, with such systems, it is rewarded segregation, while co-education is discouraged.

A separate system includes the Education of students with special needs is undertaken by specialist teachers and professionals. This separation has several negative effects: the required assistance depends on a special school which often results in more students going to special schools. In this case, Special Education is an interesting alternative, and it has all the necessary services for additional assistance (Education, n.d.).

In some countries, the funding is not linked to the students but to the educational institution that the students attend. In practice, this means that referral to special schools is rewarded. Keeping students with special needs in mainstream schools, or referring them from special schools to mainstream schools is not sufficiently encouraged. Therefore, with such systems, segregation is rewarded, while co-education is discouraged.

Co-educational programs

Co-education is an issue that has concerned most people in recent years in many countries of the world. "The current trend in its various member-states European Union is to include children with special educational needs in mainstream schools by providing teachers with various forms of support in terms of personnel, material and equipment" (Ευρωπαϊκή Επιτροπή, 1997). Summarizing, we could come to the following conclusions:

- There are three models of co-education practices in the various countries of Europe (single, double, and multi-track models).
- There is a tendency to create versatile educational centers.
- The role of the personalized educational program is common to all European countries.
- Legislative arrangements have been reached for the implementation of Inclusive Education in various countries.
- Each country defines special educational needs differently.
- The way of financing co-educational programs varies between different countries.
- About 2% of students with special educational needs in European countries are trained in a separate environment.

In any case, the process of inclusion/integration of children with particularities has a dynamic and timeless character, concerns all levels and areas of the child's life (social, interpersonal, academic, professional, etc.), as well as different developmental phases (childhood, adolescence, adulthood, etc.).

Its outcome is the result of a multitude of macro-social (legislative, educational politics, social tolerance, prejudices, infrastructure, accessibility to specialized services, etc.) and micro-social parameters (school unit, school philosophy, address, class teacher, parents of other children) who interact with each other on a continuous and constant basis (Zipper, 2004). Co-education is considered an important parameter of successful socialization for the majority of children with special needs, despite any difficulties and contradictions that arise.

But what is now supported by many researchers is that beyond more general policies, the doctrinal application of Educational Models that do not fit in individual regions and countries, the inability to take into account its specificities social context, specific groups of children, parents, and teachers, inability to deal with and resolve crises and conflicts in all everyday levels of integration and the lack of appropriate planning lead often in general or partial failures (Κουρκούτας, 2003).

In any case, inclusion should start from a very early age, even for children with special needs through the process of co-education they are part of the same world as the rest of the

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children from the beginning of their social and academic life, a fact that in one to a large extent seems to contribute at least to the social acceptance of these children.

- **As soon as possible:** All children have the right to receive the support they need as soon as possible and whenever necessary. This requires coordination and cooperation between the services, under the guidance of one of them. Stakeholders must build relationships of real communication with each other, as well as be able to understand and inform each other. Parents are key stakeholders.

- **Inclusive Education benefits everyone:** Inclusive education aims to provide quality education to all students. In order to achieve inclusive education, support from the whole community is necessary: from decision-makers to end-users (students and their families). Collaboration is essential at all levels and all stakeholders need a vision of the future: what kind of young people the school and community will produce. Changes in terminology, attitudes, and values are needed to reflect the added value of diversity and equal participation.

- **Highly qualified professionals:** In order for teachers and other education professionals to prepare for inclusion, changes are needed in all aspects of training – training programs, daily practice, recruitment, finances, etc. The next generation of teachers and education professionals must prepare to be educators for all. From theory to practice 7 students. They must be trained not only in terms of skills but also in terms of moral values.

- **Support systems and funding mechanisms:** The best indicators for funding do not come from financial data, but from measuring effectiveness and achievement. It is necessary to consider the results and parallel them with the efforts that have been made to achieve them. The effectiveness of the systems should also be monitored and measured so that funding is channeled into successful approaches. Incentive structures should be in place to ensure that more financial support can be provided if students are placed in inclusive contexts and that more emphasis is placed on outcomes (not just academics).

- **Reliable data:** Meaningful, qualitative data collection requires a systemic approach that includes student, placement, instructor, and staffing issues. Data related to student placement is a useful and necessary starting point but should be complemented by clear data on system outcomes and consequences. Data on learning outcomes, i.e. the impact of Inclusive Education, are much more difficult to collect and are often missing from each country's data collection. Finally, the main results of the discussions are summarized as follows: the design and implementation of inclusive education is a process that concerns the entire education system and all students; equity and quality are parallel concepts; Inclusive Education must be seen as an evolving concept, where issues related to diversity and democracy are increasingly important.

- Early intervention

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- Early detection and assessment
- Timely support
- Planning the transition

In Europe and at the international level, in general, it is becoming more and more accepted that the transition towards inclusive policy and practice in Education is imperative. The Council's conclusions on the social dimension of Education and training state the following: "The creation of the conditions required for the successful integration of students with special needs into mainstream contexts is beneficial for all learners" (Commission of the European Communities, 2010).

The Commission of the European Communities' Green Paper on Migration and Mobility states that: Schools must play a leading role in creating an inclusive society, as they offer the greatest opportunity for young people from the migrant and home community reception to get to know each other and develop mutual respect [...] linguistic and cultural diversity can be an invaluable resource for schools (Commission of the European Communities, 2008)

The United Nations Educational, Scientific and Cultural Organization (UNESCO) (2009) clearly states that inclusive education is an issue of equity and, by extension, an issue of quality that affects all students. Three propositions about Inclusive Education are mentioned: inclusion and quality are reciprocal, access and quality are linked and mutually reinforcing, and quality and equity are central to ensuring inclusive education.

Several studies describe the benefits of inclusion for students without disabilities. These benefits include: increased appreciation and acceptance of individual differences and diversity, respect for all people, preparation for adulthood in an inclusive society, and opportunities to master activities through practice and teaching others. These effects have also been documented in recent research such as, for example, that of Bennett and Gallagher (2012).

The positive effects of the inclusive placement of students with special needs are highlighted in research, such as that of MacArthur et al. (2005) and de Graaf et al. (2011). These effects include improved social relationships and networks, peer relationship patterns, increased achievement, higher expectations, increased collaboration between school staff, and improved integration of families into the community (European Agency, 2012).

Erasmus Mundus is a European Program which was done in two phases. The first started in 2004 and was completed in 2008. The second as a continuation of the first phase, started in January of 2009 and was completed in 2013. The program aims to improve improvement of the quality of Education, through cooperation between Europe and other countries, as well as the exchange of populations among educational institutions of all levels.

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One of the primary objectives of the Program is the cooperation between educational institutions with the goal of improving the quality of overall education inside and outside the EU. In addition, the program aims to turn the European Union into a global center of learning, promoting intercultural tolerance and understanding, developing abilities and skills useful for the citizens and the development of their social life and finally enabling nationals of other countries to obtain pro-entry into European Higher Education. Specifically, the Program seeks through the benefits the promotion of diversity and the essential combating all discrimination. At the same time, it aims at equal access of all learners with and without learning disabilities and knowledge, making particular use of the use of Information Technologies and Communication.

The urgent need for the modernization of the educational system led to the creation of the **e-Learning program**, its implementation which is distance education through the use of digital and online technologies. Specifically, through distance education autonomy is achieved in the pace of learning using an interactive environment, lower cost, and easier access to education. Therefore, intending to improve the quality of the educational process, the e-Learning program aims to the promotion of Lifelong Learning under the dimension of equal participation of all citizens in it. According to reports compiled by various European countries, the evaluation of the program showed that there are many advantages in its implementation, such as an increase in the level of digital literacy of fusion, development of cooperation between the states and their counterpart educational institutions, short-term qualitative change in curricula in teaching and learning in general. Also, there has been a significant impact on combat and countermeasures of socio-economic inequalities within society.

Similar in terms of the design and targeting of the program e-Learning can also be considered the Netd@ys Europe program, which was designed to provide the required skills for the promotion of the use of new technologies in the fields of education, training, and culture. Netd@ys Europe actions are placed dates from 1997 to 2005 and were carried out throughout Europe. In their context, student projects were implemented with the main feature of using technology, so that it becomes educational process more attractive and efficient.

The Lifelong Learning program was designed with the aim of quality upgrading of education and the elimination of inequalities in access to it, at the expense of citizens who belong to socially vulnerable groups, including people with disabilities. At the same time, the goal of the program was to turn European Education into a universal quality reference point, leading to the creation of more jobs, economic growth, and the creation of conditions for stronger social cohesion. The program supports a variety of actions that aim, among other things, to all in the promotion of creativity, competitiveness, and the development of the entrepreneurial spirit, promote language diversity and language learning, and improve the quality and ability to access the opportunities of a lifetime of learning (Σούλης Σ., 2013).

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The **"Child Guarantee"** policy is inextricably linked to its issues of disability. In particular, children with disabilities and special needs, including children with disabilities who live in institutions and closed structures, are one of the four main groups of the Child Guarantee policy. Also, children from families with parents who need support (parents with serious illnesses, mentally ill, bedridden, disabled, etc.) are one of the groups of children with "increased risk" for poverty and social exclusion.

The above policy basically started with the Recommendation of the Commission of 2013 **"Investment in children: Breaking the cycle of disadvantage"** (recommendation 2013/112/EU of 20/2/2013), which recommended that Member-States implement policies that will promote the well-being of children, through multidimensional strategies that will ensure access to adequate resources, affordable quality services and the right to participate.

Following the initiative of the European Parliament in 2015, which called the European Commission and the Member-States to explore the possibility of establishing a framework European Child Guarantee, the Commission prepared a relevant European study feasibility study (Feasibility Study for a Child Guarantee. Final Report, March 2020) and typed (March 2021) Proposal for a Council Recommendation establishing European Child Guarantee, in order to establish a European framework policy, according to which Member-States will ensure multi-annual national strategies. For the implementation of the strategies, National Action Plans should be drawn up to Guarantee for Children.

Inclusive Education is part of both the Child Guarantee policy and part of the aforementioned Common European Guidelines for deinstitutionalization. As for the latter, it is a basic preventive measure to avoid institutionalization, the elimination of institutional care feedback, and the promotion of independent living. Reference is also made to the implementation of actions for children's access to conventional (mainstream) education, such as personal help or teachers for children with difficulties, the adaptation of the school environment, the provision of specialist equipment as well as the formation of special customized teaching programs.

The UN Convention on the Rights of the Child, in articles 28 and 29, enshrines its right of access of every child to appropriate and quality education, without discrimination and on the basis of equal opportunities, defining the concept of quality with institutionalization specific educational goals. Education must favor the overall development of personality and the abilities of each child individually, to be adapted to the individual needs. Every child has the right to education and participation without discrimination (EYΣEKT, 2021).

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Other European Programs

The **Burnout Free ECI project** aims to craft a roadmap to better outcomes and lead to innovative, mutually empowering techniques and solutions to some of the most complex challenges parents with children with disabilities (CwD), professionals in the disability field and Organizations face, hindering the prospects of early childhood. Our experience from working with parents and Children with Disabilities (CwD) and recent studies have revealed the seriousness of burnout implications on parents with children with disabilities and Professionals in the disability field. The Burnout FREE ECI project addresses the tremendously serious issue of professionals’ and parents’ burnout on family-centered Early Child Intervention. It has also revealed the need to enhance the protective factors for family and ECI professionals and reduce the burnout risk factors that threaten to result in the social isolation of professionals and social exclusion of parents and children with disabilities (Burnout Free ECI project, 2024)

The **EriSFaVIA project “Early Intervention Services for Families with Children with Vision Impairment and Additional Disabilities”**, is operating under the ERASMUS+ Program, Key Action 2- Cooperation for Innovation and the Exchange of Good Practices (No: 2019-1-EL01-KA201-062886). The central notion of the EriSFaVIA project lies in the presence of a crucial situation that addresses a need that has been internationally acknowledged as very important and refers to children with vision impairment and additional disabilities (VIAD) or deaf-blindness (D/B) with their families.

The **EriSFaVIA** consortium consists of ten major organizations in six countries (Greece, Cyprus, Romania, Turkey, Croatia, and Germany). All project partners are involved in the field of visual impairment with additional disabilities or deaf-blindness with different occupations and duties. In specific, University of Thessaly (UTH-**Coordinating organization**), University of Babes Bolyai (UBB), Istanbul Medeniyet University (IMU), AMIMONI/Greece, Syzoi/Greece, ANSGA/Turkey, Mali Dom/Croatia, and Blindeninstitut München/Germany, as well as the schools (St. Barnabas School for the Blind/Cyprus and LSDV-Liceul Special pentru Deficienti de Vedere Cluj/ Romania) compose the consortium of this Project.

In total, three Universities, five NGOs, and two schools will provide strong links between theory and implementation and the outcomes will propose training programs for the professionals that will strengthen the effectiveness of the early intervention programs for young children with VIAD or D/B (Early Intervention Services, 2024)

The **Stories4ALL** project aims to support the educational community (students, teachers, and families) to explore alternative learning pathways that focus on the development, and promotion of creativity and digital skills, as well as the social inclusion of visually impaired students. In addition, the project aims to foster a sense of solidarity and active civic participation for the entire Educational Community and the wider public. The project will

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achieve its goals by combining elements of inclusion, creativity, and digital technologies such as image design/editing, digital storytelling tools, and 3D printing (Stories4ALL, 2024).

The **PrECIVIM** project aims to develop a checklist of the communication profile of students with visual impairments and additional disabilities (MDVI), to create communicative, learning, and social opportunities for students with MDVI, to promote cooperation between universities, schools, and associations of people with disabilities vision and multiple disabilities (PRECIVIM, 2024).

Special Education Teachers

In inclusive education, the collaboration between **general and special education teachers** is deemed necessary to be constructive. In addition, inclusive education includes, among others, the restructuring of mindsets, policies, and practices in schools so that the needs of all students in schools can be met through the plurality of students that teachers are called to deal with. Students with special educational needs are promoted to general education with appropriate structures that respond to their general clinical picture (Πατσιδου-Ηλιάδου, 2011).

Inclusive education is a big challenge for the teacher and the school context. Through observation and recording of behaviors, he/she needs to evaluate the progress and development of the child in the classroom. It is called upon to manage diversity based on equality, but also to meet the needs of all students (Βοζίκη, 2011).

The teacher's role of the classroom teacher is characterized as important and decisive regarding the promotion of educational interventions for students diagnosed with special needs. He/she is a qualified person who has the ability to both identify a student's difficulties and actively participate in the therapeutic program, making modifications and adjustments to his teaching according to the child's needs. The teaching plan is formed based on the student's cognitive repertoire to avoid feelings of frustration and marginalization. In addition, he/she supports psychologically the child who needs help. He/she guides the child in a consultative manner with the aim of positively strengthening his/her self-image, self-confidence, and all the feelings that ensure an effective teaching intervention in the context of the classroom. Also, an important obligation is the creation of a friendly school climate accepting all the students in the class, to avoid any feeling of stigmatization and isolation. The promotion of inclusive education will create a positive school context of encouragement and active participation of all students (Στασινός Δ., 2020).

His/her role in supporting co-education becomes particularly important. Every day he is faced with dilemmas on the part of the mediator who aims to provide more and more knowledge to the students, ensuring that they acquire the necessary qualifications for their inclusion in the labor sector. On the other hand, he/she is asked to adopt a more reflective and critical role that helps his students develop their psychosocial skills with the aim of their independence and self-realization. The teacher is asked to reshape the current school data, as a new strategy of co-education is introduced within the school. More specifically, it sets separate educational goals for each of its students, depending on their particularities and capabilities, always combining with the common curriculum. Appropriate training is required, with the aim of acquiring the necessary theoretical background to make more effective use of co-educational techniques and strategies (Σούλης Σ., 2008).

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Also, he/she helps the child, manage the time properly for the completion of an exercise, promotes team spirit and cooperation, motivates learning, plans activities based on interests and peculiarities, chooses appropriate educational software and audio-visual material. For the emotional support of the student, the teacher rewards his efforts, uses verbal praise, feeds his interests with new activities, and encourages him to try again to correct any mistakes. The equal treatment of the child with special needs with his classmates shows empathy on the part of the teacher and thus the child feels accepted, recognized, and respected (Τζουριάδου, 2015).

The role of the teacher in supporting co-education becomes particularly important. Every day he/she is faced with dilemmas on the part of the mediator who aims to provide more and more knowledge to the students, ensuring that they acquire the necessary qualifications for their inclusion in the labor sector. On the other hand, he/she is asked to adopt a more reflective and critical role that helps his/her students develop their psycho-social skills with the aim of their independence and self-realization. He/she reshapes the current school data, as a new strategy of co-education is introduced within the school. More specifically, it sets separate educational goals for each of its students, depending on their particularities and capabilities, always combining with the common curriculum. Appropriate training is required, to acquire the necessary theoretical background to make more effective use of co-educational techniques and strategies (Σούλης Σ., 2008).

The role of the director seems to be quite important for shaping and promoting Inclusive Education. Its goal is to create a cooperative climate between teachers and the director that will inspire trust, justice, mutual support, and mutual help. The principal is the link between the members of the school, reducing competition and accepting any point of view that will aim for a more cooperative school. The management's insistence on collaboration creates a climate, in which the school operates more efficiently when they operate collectively.

Teachers acquire an active role regarding the organization and operation of the school and participate equally, with pluralism prevailing. In this way, a friendly environment is created where the principal and teachers act cooperatively, promoting the practice of inclusion and desiring a school for all, without stigmatization and marginalization. A school that strives to provide opportunities for children with special educational needs to develop and overcome their difficulties (Αγγελίδη, 2019).

Classroom teachers play a key role in relation to the work to be done with the students with special educational needs who have joined regular schools. They are responsible for all students. In case of emergency, support is mainly given by a special teacher in the mainstream school –inside or outside of the classroom.

A clear distinction appears between, on the one hand, countries where support is provided by a specialist who belongs to the school staff and, on the other hand, those where the

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support is provided by a specialist professional, who doesn't belong to it. In this case, the special schools, through their teachers, play a key role in supporting integrated students and classroom teachers. This situation is aligned with the trend of special schools to function more and more like educational centers hardware and applications (resource centers). It needs to be said that in some countries (for example, in Sweden), both types of support coexist.

The support is addressed to both students and teachers, but the main burden is still on the student, although some countries clearly state that priority is given to working with classroom teachers. The support aimed at classroom teachers can be seen as a trend, but not yet implemented. External educational services, located outside the general school, may also intervene by providing various types of support to students, teachers, and parents. It can be special schools, local, regional, or national centers of educational material and applications (resource centers), local educational support groups, or school groups. This is the situation in most countries when it comes to integration. However, services other than education are also involved in supporting students with special educational needs in collaboration with the general school classroom teachers. They include support services, mainly health services (through medical staff and other therapists) and social services as well as voluntary organizations. The amount of aid provided varies greatly from one country to another and the degree of service intervention (outside of education) is very unequal.

In all European countries, classroom teachers receive some kind of mandatory training regarding students with special needs, during their initial training. Their training is usually very general, vague, or insufficient, with limited practical experience, and may not satisfy the teachers' professional needs later.

Compulsory special education training varies greatly in length, content, and organization. It is obvious that the initial training of teachers cannot attempt to cover the vast extent of their needs. But it is also obvious that differences in terms of the content of initial teacher training reflect, in some degree, the differences regarding integration policies in different countries (Ευρωπαϊκός Φορέας Ειδικής Αγωγής, 2003).

The term “highly qualified professionals” covers issues related to basic training and in-service training, the profile, values, and competencies of teachers, effective approaches to recruitment, attitudes, and the networking and coordination of all professionals.

Integration and support of the teacher:

- a. Classroom teachers are professionals who are responsible for all students, including those with special needs. In case of need, support to classroom teachers is mainly provided by specialist teachers through the General School. They may be members of the school staff or associated with external services (e.g. special schools).

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Complementary to special teachers, in some countries remedial teachers support students with learning difficulties and other members of staff.

- b. Support still mainly focuses on working directly with the learner. Direct support to the teacher is probably more of a trend than a happening event, although it is acknowledged to be the main purpose. The support offered to teachers concerns information on the individual needs of the student, selection of teaching materials, development of an individualized educational program, and organization of training courses Training of teachers in Special Education:
- All classroom teachers receive some form of mandatory Special Education training during their initial training. The training offered is usually very general, vague or insufficient with limited practical experience according to the future needs of the teacher.
 - Teachers who wish to work with students with special needs must undergo additional training, usually after their initial training. In most countries, further training is optional but strongly recommended.
 - Some countries consider supplementary training as part of the training of in-service teachers. It is mainly provided on a voluntary basis. Flexibility is the key characteristic associated with in-service teacher training and appears to be one of the most useful means of support for classroom teachers working with students with special needs.

Thus, changes in the education of students with special needs are not so much linked to their special educational needs as to social, political, economic, legislative, and religious factors. Factors that determine who is trained, how they are trained, and when they are trained.

Below are the fundamental values, but also the skills that teachers must possess:

Respect for Learner Diversity: Learner diversity is seen as a rich source of information and an asset to education. The competency areas of the specific core value are related to: perceptions of inclusive education; teacher views of student diversity.

Supporting All Students: Teachers have high expectations for all students to achieve their goals. The competency areas of the specific core value are related to: promoting academic, practical, social, and emotional learning for all students; approaches to effective teaching in heterogeneous classrooms.

Working with others: Collaboration and teamwork are essential approaches for all educators. The competency areas of this core value relate to: working with parents and families; working with other education professionals.

Personal Professional Development: Teaching as a learning activity, teachers are responsible for their ongoing education and learning. The competence areas of the specific core value are related to: teachers as thinking professionals; basic teacher education as the foundation for continuous learning and development.

To achieve the goals of Special Education, it has been given the following characteristics:

- a) Special diagnostic, medical, psychological, and educational services
- b) Special programs
- c) Special areas
- d) Special instruments and means as well as special teaching techniques

The role of the special educator is important and extremely helpful in improving the child's learning level. Some of the goals set in the context of special education concern the improvement of the following skills:

- Reading
- Writing
- Understanding or memorizing text
- Mathematics
- Concentration of attention
- Verbal and non-verbal communication
- Self-service
- Social skills

The special educator usually follows the following steps:

1. Thoroughly assess the child with weighted and unweighted tools that examine all of his skills and set the program's goals.
2. Based on the assessment, he prepares an individualized intervention program in order to strengthen the child's weaknesses.

3. The goals set are of gradable difficulty and constantly evolve during the program depending on the child's goals.

Taking all of the above into account, differentiated Instruction recognizes the special needs of students and takes over responsibility for ensuring and providing appropriate learning opportunities, as well as tailored feedback to the capabilities of students with special needs. It also aims to develop each student, in building knowledge and maximizing motivation for cognition and meta-cognitive development.

The teacher plans a variety of approaches, according to the student’s abilities and desires, for him/her to learn as much as he/she can, while he/she is as efficiently as possible. Thus, the teaching methods and the active learning methods are designed in such a way that they respond to their needs separately. This is how everyone's diversity is recognized on a cognitive level, in communication, in preferences, and in the way of learning. Specifically, students are expected to have different interests and learning profiles.

A basic principle of Differentiated Teaching is the continuous, diverse assessment. Through the evaluation, the teacher is allowed the supervision, the immediate readjustment, and the enrichment of the objectives, as well as the strategies. He/she can also identify the learning profile and the characteristics of the student, so that he/she starts his/her intervention from the level of the student, thus avoiding false expectations and the frustration of last of any failure. Also, the rating will display the interests of the student, so that the educational process is based on him/her and his/her learning profile, i.e. how he/she learns more easily and effectively (Μουταβελής, Α., 2017).

The tool of metacognition is one of the main goals of teaching. The term metacognition means the knowledge of the action, in other words, the ability to know what one does, how, why, and when to do it. The key features of metacognition are the monitoring, control, and expression of metacognitive experiences. The teacher aims to turn what he/she has taught his/her students into action so that they can apply it themselves after the lesson. To achieve metacognition, a necessary condition is the conclusion of the learning contract with the students.

Before the beginning of each lesson, the teacher should have informed his/her students in detail what they will be dealing with, how the teaching will be carried out, what he/she will do, and what the students themselves will do. Thus, it constitutes a conscious teaching where the students know all the steps of the course, thus avoiding their alienation. For children with special needs, because they face multiple difficulties, mastering metacognition requires more effort. Finally, metacognition as a starting point for self-regulation is one of the most important goals that every teacher must set in his educational practice. Through self-regulation, the child regulates his behavior, improvises, applies learned strategies,

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monitors, as well as expresses how he/she did and what he/she achieved (reflection) (Σαλβαράς, 2013).

The integration of Information and Communication Technologies (ICT) is today one of the first items on the political agenda in almost all European countries, as well as in the European Union itself. The electronic European Operational Program (2000) of the European Union, describes the actions required for the transition in the Information Society and clearly underlines the central role that education plays a role in making this transition.

However, the use of ICT in the Special Education environment is not always considered as a primary item on the agenda. Therefore, specific strategies and actions must be taken to achieve access to appropriate ICT for all students in Europe. Most countries agree that access to appropriate ICT can reduce inequalities in education and that ICT can become a powerful tool to support educational inclusion. Conversely, inappropriate or limited access to ICT can increase inequalities in Education, faced by some students including students with special needs. The digital divide that could possibly develop between educational systems an considered extremely important for the field of Special Education.

It can be argued that there is a need to shift the focus of ICT in Special Education policies and programs. Most countries seem to be now investigating how the emphasis in policy to be on results, on its aims and objectives of the use of ICT in Special Education and not only in the ways of using ICT. Such a focus will help the discussions surrounding its creation of appropriate infrastructure but will focus even more on why and how ICT can be used more appropriately in a different teacher environment.

To enable ICT in Special Education to cover their capabilities, teachers require access to more specialized knowledge and need more systematic cooperation between the various professionals who support, in several ways, teachers working with students with SEN. ICT in the support services of Special Education must be improved. The same applies to learning processes, giving teachers and other professionals time and opportunities for collaboration, and also an environment, as close as possible to their workplace, promoting guidance and professional advice. The appropriate supporting structures for the implementation of the integration of ICT in Special Education is considered as important for many teachers, as the availability of equipment and software to use. This is something highlighted by all countries in one way or another. Appropriate support is crucial for the teacher if he has to use ICT to address their individual learning needs students (Ευρωπαϊκός Φορέας Ειδικής Αγωγής, 2003).

Innovation in Special Education – Opportunities

Digital tools in the classrooms may include interactive whiteboards, robotics kits, and digital learning materials, aiming to further develop a high-quality digital education ecosystem. They will start to be installed during this school year. Also, educational groups can be planned for after the end of the daily teaching schedule or during the teaching hours of the full-day program, with subjects and activities such as creative work, sports, team sports, traditional/modern dances, choreographic expression, visual arts, crafts and constructions, musical learning instruments, educational robotics, scientific constructions, and experiments. Finally, Skills Workshops (road safety, robotics change, climate change, entrepreneurship, volunteering, etc.) are new topics in the compulsory timetable of all Kindergartens, Primary and High Schools, aiming to strengthen the transversal skills and basic abilities of students.

As a whole, educational robotics activities through the use and programming of robots have the potential to foster positive learning. So, the learning environment contains the elements:

- an ideal environment that prevails over experimentation and research by the students, but also by the teacher himself/herself.
- immediate feedback for the problem-solving process.
- the possibility of familiarization with the use of new materials and new methods.
- the possibility to develop complex mental skills, critical thinking, social skills, and skills for communication, cooperation, and innovation.
- the active participation of all students.
- support for teaching basic programming structures.
- support for the teaching of various cognitive fields, such as Mathematics, Programming, Technology, Physics and History, etc.

Special Education and Education at its core is closely related to New Technologies. Many experts have dedicated their work to offering experiences and stimuli to children with special educational needs, using innovative technologies. Since Sensory Integration is the base of the learning pyramid - and learning through movement and sensation is further enhanced - the so-called "Multi-Sensory Room" was created.

Within this room, various sensory systems are activated such as Auditory, Proprietary, Tactile, Visual, Auditory, Olfactory, and Taste. Several software and devices have been created aimed at children with various difficulties such as Autism Spectrum Disorder, Attention Deficit Hyperactivity Disorder, loss of vision or movement functionality. Children with vision loss are trained to use tablets and small devices so that they can walk down the street or write a text without the help of a third party.

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Software has even been created, where children can express themselves through music and even experience experiences that they couldn't before. Indeed, there is a large portion of students who, due to their difficulties, may not be able to participate and taste some of the existing experiences (Καγγελίδου Λεδάκη Ε., 2021).

Playful learning

- It is the utilization of game techniques in modern learning environments.
- Learning objectives are divided into smaller ones, allowing the student to focus better.
- Teacher-student cooperation is improved.
- The use of elements such as achievements, points, leaderboards, and badges, creates motivation for learning and removes students' anxiety about their performance.
- It provides immediate and authentic feedback.
- Especially helps students with special educational needs.

New Technologies can offer a variety of ways to represent, express, and manage information and these possibilities are particularly useful in special education as people depending on their particular needs/abilities communicate, express, and manage information in a specific way.

- Auditory information for example, with technological means can be converted into visual and help a student with hearing problems.
- Students with significant difficulties in language communication can express themselves in other ways, with music, with drawings, with the creation of blogs, etc.
- In addition, the possibilities offered by New Technologies (e.g. collaborative learning, knowledge construction opportunities, provision of personalized feedback through multiple representations), could help the social and school adaptation of people with disabilities and special educational needs, as well as the development of their self-confidence, strengthening the perception that the individual has of himself/herself.
- Each student can follow his/her own learning pace and receive personalized educational support, designed based on his/her needs/specificities.

The New Technologies for students with learning difficulties, autism and ADHD

Students with learning disabilities and neurobiological disorders such as autism and attention deficit hyperactivity disorder (ADHD), seem to be able to be helped by the learning environment and the possibilities provided by new technologies if they are fruitfully integrated into the educational process. Students with diagnosed dyslexia are greatly facilitated by the visual and auditory stimuli, the regular display of text, and the varied activities provided by a digital environment. In particular, tools such as the word processor Word, help children with dyslexia to function freely without the stress of writing a text by hand. They feel a personal satisfaction in seeing the result which is a neat and neat text. In fact, they appear more receptive and willing to make corrections to their text, referring to it with the sense of responsibility of the editor-author.

Accordingly, word prediction software is yet another tool for dyslexic students to help them express themselves in writing much more easily and with more confidence. The software, as it displays a variety of words with the placement of only the initial letter by the student, puts him in the selection process and provides him with the opportunity to use more difficult spelling words (Hasselbring T.S & Williams Glaser C., 2000).

The educational use of multimedia, due to the dynamic applications and audio and visual support, also significantly helps in the understanding of concepts and the development of the student's thinking, especially the dyslexic student whose knowledge, in relation to his peers is more limited (Bransford, Vye, Kinzer & Risko, 1990).

Students with dyscalculia can be helped by simulation games that involve them in dramatized situations of dealing with money (micro-markets) and confront them with basic arithmetic operations. For example, the Number Race software, exclusively designed for children with dyscalculia, aims to strengthen the representation of numbers, understand the relationships between them, and familiarize them with basic arithmetic operations, addition, subtraction, multiplication, division (The Number Race, 2024).

Regarding students with autism "the computer offers the possibility of introducing the student into a controlled and predictable environment and that, if we seek, does not contain social stimuli. In this way, it helps the student with special needs to maintain their attention and concentration in an activity" (Ευρωπαϊκός Φορέας Ειδικής Αγωγής, 2003) Institute of Education, 2003). As Jordan & Powell (1997: 170-171) argue "any person with autism, whether a child even as an adult, he can feel comfortable with computers and can develop a good relationship with someone else working on the computer with him." In particular, computers are considered the most suitable means for teaching people with autism as they:

- form bounded conditions.
- limit sensory stimuli.

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- have predictable and law-abiding behavior and are therefore controllable devices.
- do not penalize wrong answers.
- are an educational tool that can be further improved.
- enable non-verbal or verbal expression (Powell S. & Jordan R., 1997)
- are crucial in the context of ICT Policies and Practices in Special Education

The relevant policies of the countries at the national level cover five areas:

- Infrastructure
- Support
- Training
- Research/Collaboration
- Evaluation

(Ευρωπαϊκός Φορέας Ειδικής Αγωγής, 2003)

Of course, most countries adopt general policies for the use of new technologies in education and not specifically in special education. The general policy of integrating ICT in education therefore aims to promote the provision of equal educational opportunities through the application of new technologies, for all students, including those who need special education.

New technologies are included in the curricula of European countries as a tool for students and teachers, as supporting material to meet specific needs. So, it seems that there is no more specific strategy for the inclusion of ICT in special education, but ICT is included in the curriculum that applies to all students including those with special needs.

New technologies are an integral part of modern Education, especially in the field of Special Education, and an undeniably important means of learning. Of course, in order to ensure the future of this program, it is necessary for Education to monitor technological developments and then utilize them. Access to appropriate technologies can be a powerful tool to support educational inclusion (Commission of the European Communities, 2001).

3D printing and scanning in School Units

3D printing is a great revolution in industry, but also in Education. The programs that are designed, are adapted to the needs and intrapersonal abilities of the students so that they use their imagination to the fullest. In addition, it helps students with special educational needs in learning more complex and complex concepts. They make the course more attractive, interesting, and understandable. It equips students with new modern digital tools through a simple three-step process.

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Idea - Design - Printed Item

More specifically, in Mathematics, students with or without educational needs can understand geometric solids, fractions, volume, area, symmetry, and patterns, pre-education with the help of new digital tools, such as the 3D printer and the 3D scanner. Students can be helped with three-dimensional objects –special rulers that help focus attention when reading a text. With the 3D pens, they can create their own designs, fill in outlines, and thus cultivate their glyph and motor skills. In the History lesson, they can scan monuments of their place and print them, or even come into direct contact with 3D printable monuments of the World Cultural Heritage. In the Geography lesson, they can create 3D map–puzzles, with printable pieces of countries or cities. Finally, students can use their imagination to create useful, everyday objects that will beautify and/or make their lives easier. E.g. a pencil case, or a potholder.

Certainly, this technology is here to stay and we will encounter it more and more in all aspects of our daily life. It is an industry that will become established because it will be used more and more in almost all professions. The ability to introduce children to its use from an early age will be an advantage for their future educational and professional careers, something easily recognized by parents, i.e. your customers. It also combines learning with entertainment in a truly impressive way, fosters student creativity, fosters collaboration and critical thinking, and is sure to keep students of all ages engaged. The fact that it is a new innovative branch is at the same time its great advantage, as its utilization and inclusion in the educational plans of a modern school is a huge economic opportunity and something that will perhaps be a decisive factor in differentiating you from the competition and a means of breaking free from the current economic situation.

3D printing, beyond its practical possibilities, has the added commercial advantage of sensationalism and its high recognition and exposure by the media, which has cultivated curiosity and interest in the world (3DHUB, 2024).

Summary

European Commission presents an ambitious strategy on the rights of people with disabilities (2021-2030) to ensure their full participation in society, on an equal basis with other citizens, both in the EU and beyond, according to the Treaty on the Functioning of the European Union and the Charter of Fundamental Rights of the European Union, which enshrine equality and non-discrimination as cornerstones of EU policies. People with disabilities have the right to participate in all areas of life, just like any other person. Although progress has been made in recent decades in terms of access to health care, education, employment, leisure activities, and civic participation, many barriers remain.

It is worth trying to look back at the history of the development of Special Education and then we will easily see how it has characteristics of the development of a subsystem on the fringes of Education. And it is good to keep in mind that the way society deals with children and their Education is usually indicative of its level of development.

The periods-stations for Special Education internationally could be summarized in three stages:

- a) the rejection and maltreatment stage
- b) the stage of pity, care, and separate education
- c) the stage of claiming equal educational opportunities and co-education

Diversity is one of the biggest challenges in Europe's schools and classrooms. Co-education can be organized in a variety of ways and at different levels, but it is the group of teachers who mainly deal with the increasing diversity of students' needs in the school and the classroom and are the ones who should adapt or prepare the curriculum in such a way as to satisfy the needs of all students - those with special educational needs - and their classmates.

A definition states that Special Education and Education is the set of educational services provided to students with confirmed special educational needs and with or without disabilities. With Special Education, an effort is made for the child to join society as a non-dependent, but also productive member. Special Education includes everything that is offered to the child and has an auxiliary role, something that must be given in the school context and throughout the child's school life.

Students with disabilities and special educational needs are considered those who, for the whole or a certain period of their school life, show significant learning difficulties due to sensory, mental, cognitive, developmental problems, mental or neuropsychiatric disorders

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which, according to the multidisciplinary assessment, affect the process of school adjustment and learning.

At the international level, the targets of combating discrimination and promoting rights and equal opportunities for people with disabilities, are directly related to the terms of the United Nations Convention on the Rights of Persons with Disabilities (2006). Under the contract, the contracting members must adopt all appropriate measures for the implementation of rights. These rights of individuals with disabilities refer to an equal participation in education, work, and health, in satisfactory level and living conditions, aiming their equal acceptance and integration into the community (EYΣEKT, 2021).

Specifically, the principles formulated to:

1. Respect people with disabilities for inherent dignity, including individual autonomy and freedom to make one's own choices.
2. Ensure non-discrimination.
3. Allow full and effective participation and inclusion in the society.
4. Respect for diversity and acceptance of people with disabilities as part of the community.
5. Achieve equality of opportunities.
6. Achieve accessibility.
7. Ensure equality between men and women.
8. Respect for the evolving capabilities of children with disabilities and respect for their rights to maintain their identity.

Countries in Europe can be classified into three categories according to their policy for the inclusion of students with special educational needs.

- (a) The first category (one-wheel approach) includes countries that develop policy and practical applications, aimed at the inclusion of almost all students in General Education. This type of integration is supported by a wide range of services that focus on the mainstream school.
- (b) In the second category (two-wheel approach) there are two independent educational systems. Students with Special Educational Needs usually attend special schools or special classes. In general, most students who are officially recorded as having special

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educational needs do not follow the same mainstream curriculum as their non-disabled peers.

- (c) Countries belonging to the third category (multi-wheel approach) have a multiplicity of approaches to integration. They offer a variety of services between the two systems, general education and Special Education.

Diversity is one of the biggest challenges in schools and classrooms of Europe. Co-education can be organized in a variety of ways and at different levels, but the group of teachers is the one that mainly deals with it increasing diversity of student needs at the school and class and they should adapt or prepare the teaching in such a way that meets the needs of all students - those with special needs educational needs- and of their classmates (Ευρωπαϊκός Φορέας για την Ανάπτυξη της Ειδικής Αγωγής, 2006).

Inclusion is the education of all students regardless of whether they have special educational needs or not. The main milestone of inclusion is the equality of all students towards learning and Education, as well as the management of otherness in a classroom, based on the appropriate respect for diversity, acceptance, and social recognition (Oliver, 2018).

The financing of Special Education Financial resources is an essential element of inclusion. If a country promotes inclusive education, the legislation and in particular the funding rules must be adapted to this purpose. If these rules do not follow the specific objectives, then the chances of achieving the objectives are very small. In this sense, funding is a decisive factor in achieving integration. The country's descriptions clearly show that the financial system can hinder the inclusive education/integration process. Financial resources are an essential element of integration. If a country promotes co-education, the legislation and especially the financial rules must be adapted to this purpose.

In all European countries, classroom teachers receive some kind of mandatory training regarding students with special needs, during their initial training. Their training is usually very general, vague, or insufficient, with limited practical experience, and may not satisfy the teachers' professional needs later.

Compulsory Special Education training varies greatly in length, content, and organization. It is obvious that the initial training of teachers cannot attempt to cover the vast extent of their needs. But it is also obvious that differences in terms of the content of initial teacher training reflect, in some degree, the differences regarding integration policies in different countries (Ευρωπαϊκός Φορέας Ειδικής Αγωγής, 2003).

The term “highly qualified professionals” covers issues related to basic training and in-service training, the profile, values, and competencies of teachers, effective approaches to recruitment, attitudes, and the networking and coordination of all professionals.

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Digital tools in the classrooms include interactive whiteboards, robotics kits, and digital learning materials, which aim to further develop a high-quality digital education ecosystem and will start to be installed during this school year. Educational groups are also planned for after the end of the daily teaching schedule or during the teaching hours of the full-day program, with subjects and activities such as creative work, sports, team sports, traditional/modern dances, choreographic expression, visual arts, crafts and constructions, musical learning instruments, educational robotics, scientific constructions - experiments.

Finally, Skills Workshops (road safety, robotics change, climate change, entrepreneurship, volunteering, etc.) are new topics in the compulsory timetable of all Kindergartens, Primary and High Schools, with the aim of strengthening the transversal skills and basic abilities of students. New Technologies and 3D scanning in school Units for students with learning difficulties, autism, and ADHD play a significant role in the integration and conclusion of these students. They make the course more attractive, interesting, and understandable.

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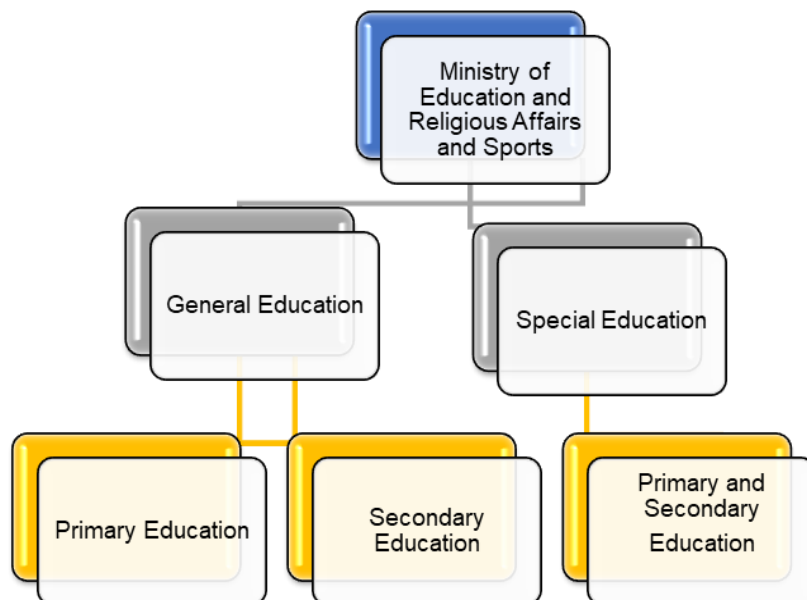
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3. National Education Systems

3.1. National Educational System – GREECE

General Education

The provision of free Education to all citizens and at all levels of the state Education System is a constitutional principle of the Greek State. The Greek Educational System is centralized. National laws, presidential decrees, and ministerial acts are prevalent within it.



Central level

The **central** administrative body for the Education System across all fields, agencies, and levels is the [Ministry of Education and Religious Affairs](#). It takes the key decisions related to long-term objectives. It also regulates various issues, such as curriculum content, staff recruitment, and funding.

Regional and local levels

At the regional level: the regional education directorates oversee the implementation of the national educational policy.

At the local level, the directorates of Primary and Secondary Education supervise all schools in their area. In their turn, school units make sure they run smoothly.

Teachers

Educational officials of the country are **higher education graduates**. The main route into teaching in Primary Schools is to take a 4-year degree in a Pedagogical Department. In Secondary Schools, most teachers follow a 4 or 5-year subject-based degree at a teacher education faculty.

Stages of the Education System

- Compulsory Education in Greece
- Primary Education
- Secondary Education
- Second Chance Schools (SDE)
- Higher Education
- General Adult Education

Compulsory Education lasts eleven years and extends from the ages of 4 to 15. The stages of the formal Greek Education are mainly six.

Primary Education

Primary Education includes preschool and Primary Schools.

Nipiagogeio - Kinderdarden

Nipiagogeio (pre-school) in Greece has become compulsory for all 4-year-old children, since school year 2018/19. Infant Centers (vrefikoi stathmoi), Infant/Child Centers (vrefonipiakoi stathmoi), and Child Centers (paidikoi stathmoi) represent early childhood care. They are run under the remit of the municipal authorities. They cater to children between the ages of 2 months and up to the age of the beginning of Compulsory Education.

Dimotiko Scholeio - Primary School

Dimotiko Scholeio (Primary School) is the next stage and spans 6 years. It concerns children in the age range of 6-12 years. Since school year 2016/17, there is a single type of school with a new revised daily timetable. Within this framework, all pre-schools and Primary Schools provide an optional all-day program.

Secondary Education

Secondary Education includes two cycles of study:

Gymnasio - Middle School

The first cycle is compulsory and corresponds to Gymnasio (lower secondary school).

- It lasts 3 years
- It provides General Education
- It covers ages 12-15
- It is a prerequisite for enrolling at general or vocational Upper Secondary Schools
- parallel to imerisio (day) gymnasio, esperino (evening) gymnasio operates. Attendance starts at the age of 14 and lasts 3 years, as well.

Lykeio - High School

The second cycle is the optional geniko or epangelmatiko lykeio (general or vocational Upper Secondary School).

- It lasts 3 years
- Pupils enroll at the age of 15
- There are two different types:
 1. Geniko (General) Lykeio. It lasts 3 years and includes both common core subjects and optional subjects of specialization
 2. Epangelmatiko (Vocational) Lykeio. It offers two cycles of studies:
 - a. The secondary cycle

b. The optional post-secondary cycle, is the so-called “apprenticeship class”.

- Parallel to day Lykeia, there are also:
 1. Esperina Genika (Evening General) Lykeia
 2. Esperina Epangelmatika (Evening Vocational) Lykeia.

General adult education

- Second chance schools
- Evening General Upper Secondary Schools
- Evening vocational Upper Secondary Schools
- Vocational training schools (ESK)
- Vocational apprenticeship schools (EPAS) of OAED
- Vocational Training Institutes (IEK)
- Post-secondary cycle of studies - apprenticeship class
- Lifelong Learning Centers (KDVM)
- Colleges

Second chance schools (SDE)

SDE are public and target persons aged 18 years or older, who have not completed the nine-year compulsory education and hold the Primary School leaving Certificate. Attendance lasts two years.

Post lower secondary vocational education and training, level 3

It is provided in:

- Vocational training schools (ESK)

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- Vocational apprenticeship schools (EPAS) of the Manpower Employment Organization (OAED)

Attendance lasts 2 years and includes grades A and B. Holders of the Lower Secondary School Graduation Certificate, or equivalent, can enroll in grade A, without exams. ESK can be public or private, day or evening. EPAS are public.

Post-secondary vocational training, level 5

It is provided in:

- Vocational training institutes (IEK)
- Post-secondary cycle of studies - apprenticeship class

IEK provide initial vocational training to graduates from upper secondary schools, i.e. general upper secondary schools (GEL), vocational upper secondary schools (EPAL), as well as holders of equivalent certificates/degrees. Vocational training lasts 4-5 semesters. For EPAL graduates and holders of equivalent vocational certificates or degrees, vocational training may last 2-3 semesters. IEK may be public or private.

The post-secondary cycle of studies - apprenticeship class provides initial vocational training to graduates from upper secondary vocational schools, or holders of equivalent certificates or degrees, who have a basic level of knowledge, skills, and competencies. The post-secondary – apprenticeship program lasts 11 months.

Higher Education

Higher Education is the last level of the formal education system. Most undergraduate degree programs take 4 academic years of full-time study.

Postgraduate courses last from one to two years, while doctorates at least 3 years.

HE comprises:

The University Sector (Panepistimio):

- Universities (AEI)
- Technical Universities
- The Athens School of Fine Arts (ASKT)

The Technological Sector:

- Technologica Ekpaideutika Idrymata (Technological Educational Institutes - TEI)
- The School of Pedagogical and Technological Education (ASPETE).

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It is noted that Educational Institutes have merged with Higher Education Institutes (AEI).

Lifelong Learning

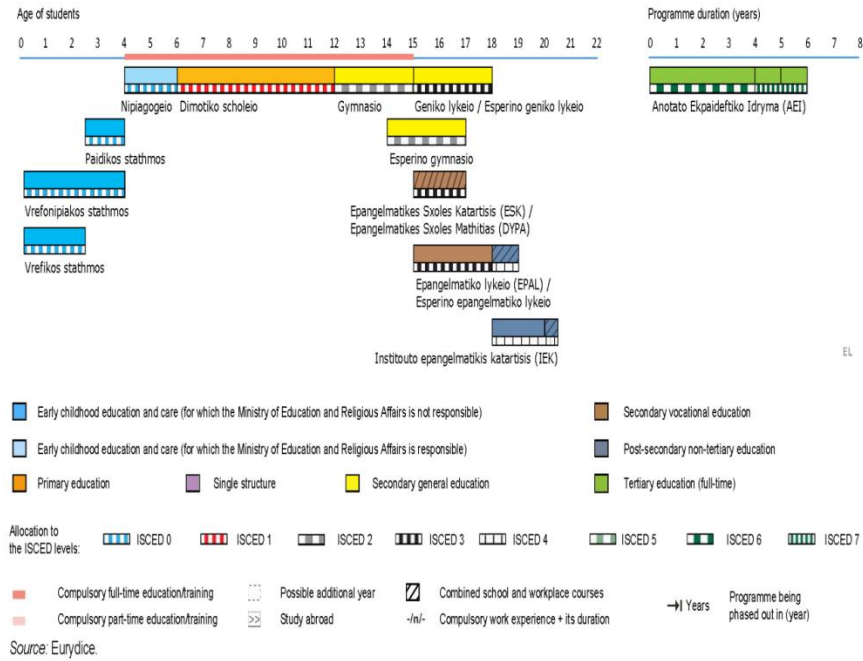
Lifelong Learning policy in Greece is part of a wider development plan. Law 4763/2020 aims at further reforming LLL structures and facilitating the implementation of LLL policy. The General Secretariat for Vocational Education, Training and Lifelong Learning and Youth plans the public policy of LLL and youth. Non-formal Education can lead to certifications recognized at the national level. Lifelong Learning Mainly Provided at:

- Scholeia Defteris Efkairias (Second Chance Schools - SDE)
- Institouta Epaggelmatikis Katartisis (Vocational Training Institutes - IEK)
- Epaggelmatikes Sxoles Katartisis and Epaggelmatikes Sxoles Mathitias OAED (Vocational Training Schools, ESK; and Vocational Training Apprenticeship Schools, EPAS of OAED)
- Kentra Dia Viou Mathisis (Lifelong Learning Centers, KDVM)
- Kollegia (Colleges)

Law 4763/2020 introduces the National System for Education and Training which is developed along the lines of levels 3, 4, and 5 of the European Qualifications Framework (EQF). LLL structures included in the formal Education System are Second Chance Schools (SDE) and Vocational Training Institutes (IEK). The reform provides for the creation of postsecondary non-compulsory schools for ages between 16 to 23 (ESK and EPAS) which are included in the formal Education System. Lifelong Learning Centers (KDVM) and colleges are part of the non-formal Education System.

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Greece - 2023/2024



Special Education in Greece

Special Education and Training is an integral part of General Education.

Special Primary Education

Pre-primary School
 Until 7 years old

Special Secondary education

Special Elementary School until 19 years old
 Special High School until 23 years old

Special Secondary Education

EEEEK Special Professional Schools

Special Primary Education

Special Primary School
 Until 14 years old

Definition of the target group(s)

Special education in Greece constitutes several educational services for students with disabilities and/or special educational needs followed by a medical diagnosis.

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The state ensures and continually improves the compulsory nature of Special Education emphasizing the fact that it constitutes an integral part of compulsory and free-of-charge public education, provided to disabled individuals of all ages and of all grades and levels of Education.

Under [law 3699/2008](#):

- Students with disabilities and/or special educational needs include those who appear to have significant learning difficulties during an entire or limited period of their school life due to sensory, mental, cognitive, developmental, psychological, and neuropsychological disorders.
- Students presenting mental disabilities, sensory impairments in vision and hearing, mobility disabilities, chronic incurable diseases, speech disorders, special learning difficulties (e.g. dyslexia, dyscalculia), attention deficit disorder with or without hyperactivity, diffuse developmental disorders (autism spectrum), and multiple disabilities.
- Students with special educational needs also include students the ones with complex cognitive emotional and social difficulties, delinquent behavior due to abuse, parental neglect and abandonment, or due to domestic violence.
- The Category of students with special educational needs may also include students with one or more special mental skills and talents.
- Students with low school performance associated with external factors, such as linguistic or cultural particularities do not fall under the category of students with special educational needs.

More Specifically

- Students with disabilities and/or special educational needs
- presenting mental disabilities
- sensory impairments in vision and hearing
- mobility disabilities
- chronic incurable diseases
- speech disorders

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- special learning difficulties (e.g. dyslexia, dyscalculia)
- attention deficit disorder with or without hyperactivity
- diffuse developmental disorders (autism spectrum) and multiple disabilities
- complex cognitive emotional and social difficulties
- delinquent behavior due to abuse, parental neglect abandonment, or due to domestic violence

The category of students with special educational needs may also include students with one or more special mental skills and talents.

Students with low school performance associated with external factors, such as linguistic or cultural particularities do not fall under the category of students with special educational needs.

Structure of Special Education in Greece

Special Education Unit
In General Schools
Consultant for Special Education

KEDASY
School Support Units (EDY)

Integration Classes

Parallel Support

Special Support Staff
School nursery

Specific support measures

The educational policy on the education of students with disabilities and/or special educational needs targets their integration into mainstream schools by providing suitable support structures and services.

Student disability and special educational needs are investigated and ascertained by the Centers for Interdisciplinary Assessment, Counseling, and Support (KEDASYs).

Based on the individual evaluation and the recommendation of KEDASYs, the education of individuals with disabilities and/or special educational needs, may take place in a mainstream school, where the following schooling options are available. Specifically, students may attend:

- An **ordinary mainstream school classroom**, in case of students with mild learning difficulties, supported by the classroom teacher, who cooperates on a case-by-case basis with the KEDASYs and with the Coordinators of the Educational Work of general and special/inclusive education.
- A **mainstream school classroom**, with concurrent support-inclusive Education by special education teachers, when this is imperative by the type and degree of the special educational needs.

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- Specially organized and suitably staffed **integration classes**, operating in the general and Vocational Education Schools.
- **Integration classes** aim at creating a fully inclusive school environment for students with special educational needs. Teachers of integration classes shall support students inside their school environment whilst working closely with classroom teachers to differentiate activities and teaching practices and introduce adjustments to the learning content and teaching environment ([law 4368/2016](#)). This is achieved through the implementation of special education programs, teaching and learning content adjustments, and the use of special equipment, including e-equipment, software, logistics, and other solutions provided by **KERASYS**.

Educational evaluation and support of students and the school community, within the school’s premises is undertaken by the Committee of Interdisciplinary Support, which operates in every school unit belonging to the School Network of Educational Support (SDEYs).

SDAYs are founded upon the decision of the Regional Educational Director and they are constituted by school units and training workshops of Primary and Secondary General, Special, and Vocational Education with the purpose of promoting cooperation, as well as coordinating the work of school units, so as to ensure equal access to Education of all students and to promote their psychosocial health in total. A Special Education School Unit (SMEAE) is the support center of every School Network of Educational Support (SDEY).

Supportive measures are also the following regulations:

- **Braille** is officially recognized as the writing method for blind students.
- The **Greek Sign Language** is recognized as the first language of the deaf and hard of hearing students and Modern Greek is recognized as their second language, which is received and pronounced in written form, while its oral perception and expression constitutes an additional social choice of deaf students. Greek Sign Language and Modern Greek are recognized as equal to each other, and therefore the appropriate language pedagogical approach is bilingual education.
- For autistic students with or without reason, Modern Greek is recognized as the official language, which is received and pronounced in its oral form, in its written form, and/or **in the form of symbols-images**. A desirable condition for the placement of teachers and special educational staff (EEP) in the special school units

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for autism, in addition to the other qualifications, is the specialization and training of teachers in modified-assisted forms of communication.

Under law 3699/2008, the Ministry of Education establishes an advisory committee:

- to monitor the physical accessibility of people with disabilities to the educational and administrative structures of the Ministry of Education and Religious Affairs.
- and to monitor the digital accessibility of educational materials and websites.

(<https://eurydice.eacea.ec.europa.eu/national-education-systems/greece/special-education>, n.d.)

When attendance of students with disability and/or special educational needs in schools of the mainstream Educational System and integration classes is especially difficult, the Education of these students may be provided by:

1. School units of Special Education.
2. Schools or classes that operate either individually or as branches of other schools in hospitals, Rehabilitation Centers, Youth Education Institutes, Institutes of Chronic Disease, or services of Education of rehabilitation of mental health units.

For Primary Education:

1. Special pre-schools and early intervention classes which operate within these Nipiagogeio, for students up to 7 years old.
2. Primary Special Education Schools

For Secondary Education:

1. Lower Secondary Special Education Schools
2. Upper Secondary Special Education Schools

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3. Special needs vocational lower – Upper Secondary Education Schools (ENEEGy-L)
4. The Special Vocational Education and Training Workshops (EEEEKs)

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The frameworks for the implementation of inclusion practices and equal co-education In the Greek education system, students with learning difficulties, according to law 3699/2008, may study:

- (a) in the general school classroom with support from a special pedagogue/orthopedic pedagogue, within the framework of the institution of co-education/parallel support.
 - (b) in separate departments (integration departments, remedial teaching departments) operating within General Education Schools.
 - (c) in independent schools for Special Education (Kindergartens for special education, Primary Schools for Special Education)
 - (d) in schools or departments that operate either as independent or as branches of other schools in hospitals, Rehabilitation Centers, Institutions for the Education of Minors, or Institutions for the Chronically Ill.
- d) at home.

In conclusion, the types of school classes that a child with learning difficulties can attend are three: General School class, Segregated School class, and Special School class.

These three types of school classrooms constitute the field of implementation of integration practices and equal co-education. The implementation of these practices is planned to take place within the framework of the implementation of specific models of inclusion and equal co-education. In this work, the term Individual Education Program (A.P.E.) has replaced the term Individualized Education Program (E.E.P.), the initials of which are the same as the initials of the term Special Educational Personnel (E.P.).

Inclusion and co-education models

The various co-education practices have led to the creation of implementation models, which are offered as alternative solutions for providing Education to students with learning difficulties. Several models of integration and equal co-education are mentioned (Webber, 1997: Gildner & Zionts, 1997: 105, n.d.), the most important of which are:

1. Placement in a Special School class with partial placement in a General School class. This model is implemented informally in various regions of Greece and is based on the essential cooperation of teachers who serve in General and Special Education school units. The

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programs that are mainly implemented with this model concern the school and social integration of children with severe learning difficulties and are related to secondary courses of the comprehensive school curriculum or are held in the context of school holidays.

2. Placement in a General School class with support in a special class or integration department. This model began to be applied in Greece in the school year 1983-84, especially for children with learning difficulties (Stasinou, 1991: 245, n.d.) After the passing of Law 2817/2000, the special classes were renamed integration departments, while their function is in a period of redefinition (Imellou, 2003a: 92-93, n.d.)

3. Placement in a General School class with support from a peripatetic teacher. The itinerant teacher model was proposed by Law 2817/2000 (Article 1, Paragraph 11a). According to the specific proposal, the placement of the child with learning difficulties is accompanied by the support of a special pedagogue/ortho-pedagogue, who serves either in the Diagnostic Assessment and Support Centers (K.D.A.Y.) – which have now been renamed Centers of Differential Diagnosis, Diagnosis, and Support (K.D.D.Y.) - or in School Units of Special Education and Education (S.M.E.A.E.).

4. Consultation model or placement in a General School class with support from a special pedagogue/ortho-pedagogue. The implementation of the advisory model, initially by the special pedagogues/ortho-pedagogue of the inclusion departments, in the classes of the Greek General Primary School became possible after the signing of a relevant decision on the subject: "Inclusion, study, and graduation of people with special educational needs in all types of Special Education schools and Integration Departments", which was published in F.E.K. 1319/T/B'/10-10-2002 and was signed by the Minister of Education P. Efthymiou. This model has been applied experimentally with particularly encouraging results (Deropoulou-Derou, 2000; Vlachou-Balafouti, 2000b; Haroupias, 2000; Imellou, 2000; Gena, 2001; Haroupias and Pervanas, 2002; Imellou, 2002b, n.d.), while in recent years it is recorded with the term 'co-education/parallel support'.

5. Placement in a General School class with simultaneous and permanent support from a special pedagogue/orthopedic teacher (all children with learning difficulties in one class) or a special pedagogue/orthopedic teacher and a member of the paramedical staff or only an assistant (condition: the class does not have more than 24 children). This model is not applied in Greece.

6. Placement in a mainstream school class with few or no support services. The implementation of this model presupposes the previous support of the child with learning difficulties in the context of another of the already mentioned models of inclusion and equal co-education. The consultation model is one of the most popular and is considered the most successful model for the full integration of children with learning difficulties. According to this, the specialist, who is usually a specialist 32 pedagogue/remedial pedagogue, works

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collaboratively with the General Education teacher in planning and teaching lessons, adapting strategies, managing student behavior, and developing teaching materials. The special educator/remedial teacher can help the General Education teacher to adapt, redesign, and control the strategies implemented in the classroom, which are related to specific students.

Also, it can provide behavioral observations, diagnostic assessments, coaching, collaborative programming, and materials necessary for the student's educational success. The cooperation of general and special education teachers can be done at the school unit level (cooperation with all general education teachers of the school unit) or at the level of part of the school unit (cooperation with two to four General Education teachers). In cases of establishing collaborative practices, factors such as the frequency of exchange of views and the thematic focus of each session signal the quality of the practices themselves (Belmont & Vérillon, 1999, n.d.).

There are several variations of the counseling model, such as (a) team teaching, (b) supported education, (c) complementary instruction, and (d) parallel teaching instructions.

In Supported Education, most of the teaching is done by the General Education teacher, while the special pedagogue/orthopedic pedagogue carries out some activities in the classroom, such as writing on the overhead projector or the blackboard, making pamphlets to share with the children, etc. In supplementary teaching, two subjects are taught at the same time, as one subject is included in the other, just as, for example, teaching children how to take notes may be included in an Environmental Studies course.

In Parallel Teaching, the special pedagogue/remedial pedagogue teaches a small group of children individually, while the General Education teacher works with the rest of the class. Parallel teaching is usually recommended for students with severe learning difficulties. Of particular interest is group teaching, in which the special pedagogue/orthopedic pedagogue plans and implements lessons in collaboration with the General Education teacher.

Each teacher can be responsible for a part of the daily lesson. In this variant, it seems possible to include several students with learning difficulties in the same school class as the General School. In any case, regardless of the model of equal co-education that is implemented each time, the special pedagogue/orthopedic pedagogue should ensure the formation of a supportive teaching and learning environment, which will emphasize the development of a relevant culture, in the context of the operation of each school unit (Hatzipanagiotou, 2008, n.d.).

Moreover, the inclusion of students with Special Educational Needs in the regular school, as well as their inclusion in it, was encouraged by the signing of the Salamanca Declaration, in 1994, which established the inclusion of children with Special Needs, i.e. those with

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disabilities, special gifts or children cultural minorities and marginalized areas (Unesco, 1994).

The term Inclusive education renders in Greek the corresponding English term "inclusive education" (Stasinou, 2016). Some scientists do not accept this rendering of the term in the Greek language and suggest others. Goudiras Dimitris proposes the use of the term "Uniform education" with the argument that this term emphasizes the right of children with educational needs as well as disabilities to equal participation in Education, while on the contrary he argues that the term "inclusion" maintains its negative connotations discrimination and the disadvantage that these children follow as a stigma (Goudiras, 2013, n.d.).

Regardless of the meaning of the term, all scientists when they refer to it mean something in common, that is, the joint participation of all students with or without disabilities in Education and the provision of equal opportunities, without any discrimination. This method promotes the social inclusion of individuals through the socialization processes that take place within the school classroom and leads to the acceptance of the individual's diversity and uniqueness and the reduction of the existence of stereotypes.

Through interacting and working with others, students learn to respect the individuality of individuals. The participation of individuals in Education promotes their cultural and social life, thus leading to their completion (Felder, 2019, n.d.).

However, the implementation of Inclusive education is not an easy task but presents difficulties. The aim of this is the real co-education of students with special needs and not just their integration within the class, without however leading to their development and the promotion of learning.

The school system should be accessible to all students both in terms of accessibility - that is, the school unit has the necessary facilities to facilitate the students - and in terms of functionality. The decision to enroll a student in his neighborhood mainstream school must be made individually, after extensive and valid assessment.

Significant Differences between Primary and Secondary educational integration of Students with special educational needs

- Although in Primary Education the inclusion of children with educational needs is progressing, the problems in secondary education are more.

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- the different way of organizing Secondary Education programs and the required expertise in Special Education subjects per subject hinder the smooth learning of students with special needs.
- In Secondary Education, as age increases, this has the consequence of widening the gap between students with difficulties and those without, so it is more difficult to be integrated.

In all EU countries, the current trend in Special Education is the development of a policy of inclusion of students with special educational needs in mainstream schools (European Commission/ Eurydice/ Eurostat, 1999/2000. European Agency for Special Education, 2003, n.d.).

Chronology

Key-periods:

- Special Education until 1970
- Special Education since 1970

(Polychronopoulou, S., 2001)

Special Education until 1970

1900 – 1950: There is no systematic development in the field of Special Education. Some efforts are made, mostly individual, isolated, and piecemeal. However, the resulting institutions rarely outlived their founders.

Among the most worth-mentioning initiatives of that era, we shall include:

- the Association "HOUSE OF THE BLIND" was founded in Kallithea, in 1905. Until 1982, a school for the blind operated on the association's premises under the auspices of the Archdiocese of Athens.
- the "National Foundation for the Protection of the Deaf-Charalambos and Eleni Spiliopoulos" was founded in Ampelokipi, in 1936.
- the School for Blind Girls, which offers more social protection to young blind girls, was founded in Filothei, in 1939 by the association: "FRIENDS OF THE BLIND" founds.
- a similar school, named "ILIOS", operates in Thessaloniki.

Education of mentally retarded children:

- 1929: Educational reform is attempted and the establishment of schools for the Education of mentally challenged children is planned.
- 1937: The Model Special School of Athens is founded. Director Roza Imbrioti proposes to establish counseling centers, special schools, and boarding schools and

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to teach the course of therapeutic pedagogy in the Pedagogical Academies. He proposes to send teachers abroad for specialization in E.A. trainers and teachers in speech therapy.

1950-1970: Remarkable moves are being made for the child's mental health and the Education of children with special needs.

Thus, we have the establishment of:

- the Hellenic Society of Child Hygiene and Neuropsychiatry.
- the Medical Education Center of the Educational Association of Athens (1954).
- the Mental Health Center (1956).

Private initiatives were also developing.

New institutions are established, including:

- the Association of Parents and Guardians of Maladapted Children (1961), with a capacity of 350 children
- the Foundation for Maladjusted Children "THE THEOTOKOS" (1966)
- the Sikiarideo
- the Psycho-Pedagogical Center of the Experimental Health Unit of Thessaly
- the Therapeutic-Pedagogical Foundation of Patras and some private special schools.

On the part of the state, the Ministry of Health and Welfare establishes non-profit institutions for the care and protection of children with SEN.

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Special Education since 1970

- Decades of the 70s: The YP.E.P.Th. is more active in the field of Special Education.
 - 1972 and 1973: The first Special Schools for mentally retarded children are established.
 - 1974: The first curriculum plan for special schools is made.
 - 1976: The Office of Special Education of the Ministry of Education and Culture is transformed into a Directorate of Special Education.
 - The Maraslio Teaching School trains teachers in Special Education.

- **1980s: Things improve:**
 - Various Special Education parents' associations are organized.
 - New Special Schools are established.
 - Public opinion is sensitized. Mass Media contribute to that. The state body becomes more visible.
 - Law 1143, on Special Education, was passed in 1981 in the Parliament.
 - The institution of Special Classes was implemented in regular schools, in 1984.

- **1990s & 2000s operating:**
 - 37 Special Kindergartens
 - 131 Special Primary Schools
 - 7 Special Middle Schools
 - 5 Special High Schools

A Program supported by the European Union under the name HELIOS was implemented (1988) for children with special difficulties, who attend special classes together with other children, without special educational needs. (Polychronopoulou, S., 2001 and Kardarakos, http://www.da3.gr/eidiki_agogi/17-istoriki-diadromi-after-70-today.htm/1012/2010, n.d.)

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Education provision for students diagnosed with special educational needs has begun to change in recent years. In the past, there was a tendency for students diagnosed with some form of special educational needs to attend instruction in a separate classroom or school unit environment. Therefore, classrooms were organized according to the degree and severity of the special educational needs of the students and the educational needs they had (Smith, et al., 2014, n.d.). Already in the 1950s, the institution of parallel support for education began to appear, with the result that the educational system of each country was enriched (Squires, Kalambouka, & Bragg, 2016, n.d.). In this way, it was not possible to exclude any student from education except in extreme cases where participation in Special Education classrooms may be necessary and more beneficial (Griffin & Shevlin, 2011, n.d.).

It is necessary to note that the Educational Systems of each country were affected by this development as a result of which they proceeded to include students with special educational needs or disabilities in General Education. This in turn had a direct effect on the inclusion of students in other aspects of everyday life (Shevlin, Winter, & Flynn, 2013, n.d.).

The practices that are proposed for the inclusion of students who have been diagnosed with some of the higher difficulties and have some educational needs are now more inclusive. Their goal is to create an inclusive school environment, giving everyone equal access and opportunities to knowledge, learning, and teaching (Winter & O' Raw, 2010, n.d.).

Inclusion means that all students are part of a single school community, regardless of their strengths and weaknesses. Students who have been diagnosed with a form of special educational need don't have to be in different environments (An & Meaney, 2015; Griffin & Shevlin, 2011, n.d.) However, these students deserve to have full access to all educational resources and to create social interactions with their peers who don't face any difficulty (Wilhelmsen & Sorensen, 2017, n.d.). The ultimate goal of inclusion is to create classrooms with fewer or no restrictions to meet the needs of all students. Unfortunately, however, teachers are not always prepared to take over classrooms where there will be students with and without special educational needs or disabilities at the same time (Zapata, 2017, n.d.).

Although teachers may have a positive attitude towards inclusion in the education of students with special educational needs and disabilities, they do not feel prepared for teaching (Winter & O' Raw, 2010, n.d.). Even where teachers have the ability to advance their teaching, they may lack the appropriate level of confidence to do so (Hyunjeong, Tyler-Wood, Kinnison, & Morrison, 2014, n.d.). The respective Educational System must take care of the students and implement the appropriate strategies for their successful integration (Squires, Kalambouka, & Bragg, 2016, n.d.)

Legislation 1824/1988 established remedial teaching in Greek Education, which was addressed to students studying in educational institutions, Primary or Secondary School units. In this way, it had been assumed that the case of additional teaching assistance could

be generalized. This practice of the Greek Educational System was in agreement with which was received in 1984 by the Council of Ministers responsible for Education in the European Community. The mention of the fact that since then failure within the context of education was associated with very specific characteristics of the student population or function of educational units.

However, there were also reports that this failure has a direct relationship with certain social causes (Varnava-Skoura, Vergidis, & Kasimi, 2014, n.d.). According to Varnavas-Skoura, Vergidis, Kasimi (2014), in 1991 the practice of remedial teaching took the form of supplementary teaching and concerned students who needed extra help if this was determined by the teachers. Several years later, specifically in 2003, the objectives that accompanied the remedial teaching in the Greek teacher system.

Teachers in Special Education

Special duties of the e.a.e. teacher: The work of the e.a.e. teacher is often challenging and with a variety of activities and may include, among other duties, those prescribed by legislation for general education teachers and a range of typical work activities, which according to Liz Ellis (2009) are:

- teaching, either to individuals or to small groups of students, inside or outside the classroom
- preparation of courses and resources
- grading and evaluation of assignments
- development and adaptation of conventional teaching methods, so that they meet the individual needs of each student
- use of special equipment and facilities, such as audio-visual equipment and computers, to stimulate interest in learning
- use of special skills, such as teaching Braille for students with visual disabilities (blind, amblyopic with low vision), or sensory hearing disabilities (deaf, hard of hearing), etc. (Law 3699/08)

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- working with the classroom teacher to determine appropriate activities for students in relation to the syllabus
- assessment of children with long-term or temporary learning difficulties and collaboration with colleagues in order to identify the special educational needs of each student
- collaborative contacts with other professionals, such as social workers, speech and language therapists, physiotherapists and educational psychologists
- close working relationship with parents or guardians
- organizing learning outside the classroom, in activities such as community visits, school trips, or sporting events
- help with the personal care of students with severe disabilities/medical needs
- bureaucratic, including reporting and keeping records of student progress
- attendance at statutory annual reports, or other relevant meetings, such as reviews of child welfare services, relating to pupils with special educational needs, which may include the review of special educational needs reports
- participation in in-service training
- behavior management

(Ellis 2009, n.d.)

In particular, teachers who undertake co-education/parallel support services must assume responsibilities that are directly related to the particularities of the particular student. Because these responsibilities cannot be predicted in advance and are related to the particularity of students in learning and behavior, we will highlight certain obligations that characterize co-education/parallel support and that every teacher needs to know.

In any case, the teacher by personal inquiry into the school community, family, state assessment services, and significant others related to the student's life and support adjusts his duties and responsibilities in a manner that ensures the goal of state-provided service, the equal co-education (inclusion).

Special education is made up of a group of therapists, who can contribute to the cognitive and psycho-emotional development of children and, in general, individuals, with different deficits and particular inclinations. The scientific training of the Special Educator is based on

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teaching through alternative learning methods. So, the Special Educator can teach the school subjects (such as e.g. reading, mathematics, written expression, etc.), but also deals with the emotional support of children, improving their social skills in order to cope with the demands of school and society.

Eventually, the Special Educator teaches the child how to learn. This way is not the same for all children. It therefore mediates between the child and his learning as well as between the parents and the expectations for their child's future. The family can be contacted in order to deal with issues related to school learning, autonomy, and the child's behavior.

The Special Educator is one of the most basic people involved in the education and training process of children with special (educational) needs and skills. His role is multifaceted and for this reason, his professional status often tends to be confused with the people who practice different therapies in Special Education.

The Special Educator has as the basis of his scientific training, the pedagogical competence, which allows him to teach the children and indeed through alternative forms of learning. This means that his main concern is the education and training of students through the use of special technical and supervisory means, adapted to the needs of each child.

However, his role, in addition to being pedagogical, is supportive and advisory, as he mediates not only between the child and his learning process but also between the child and his own family, with all the requirements that the school system entails and the wider society.

A special educator focuses on various areas of special needs and supports the cognitive development of students on the one hand and their emotional development and social skills on the other, ensuring their easier integration and inclusion in the school and social context.

Therefore, by teaching each child and teenager how to learn and depending on their specializations, he creates personalized special education programs, with the ultimate goal of a therapeutic approach and learning support for children and teenagers who present:

- Learning difficulties
- Specific Learning Difficulties (Dyslexia, Dysgraphia, Dysreading, Dyscalculia).
- Attention Deficit Hyperactivity Disorder (ADHD)
- Mental retardation

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- Pervasive Developmental Disorders (Autism, Asperger's, Rett Syndrome, Childhood Disorganized Disorder, and Pervasive Developmental Disorder - not otherwise specified)
- Speech and language disorders
- Neurological and Sensory Disorders (Hearing and Visual Impairment)
- Genetic Syndromes
- Kinetical disabilities
- Behavioral disorders
- Evolutionary disorders

More specifically, the areas on which the special education program focuses are the following:

A) LEARNING - COGNITIVE FIELD

1. Learning letters and numbers
2. Reading function
3. Search/Locate and Edit Information
4. Reading Comprehension
5. Spelling ability
6. Production of written speech / Written Expression
7. Production of oral speech / Narration / Description
8. Discourse organization and structure
9. Grammar / Morphology
10. Pre-Mathematical Concepts
11. Arithmetic/Computational ability

12. Mathematical thinking and analysis

B) THERAPEUTIC SECTOR – SKILL DEVELOPMENT

1. Concentration
2. Visual perception - Memory
3. Auditory perception
4. Phonological awareness
5. Language cultivation / Semantics
6. Writing organization
7. Execution of orders
8. Fine mobility / Graphomobility

At the same time, through the personalized programs of Special Education, the delimitation of the child/adolescent's behavior is achieved, the ability to organize it in the context of spatial and temporal concepts, and the strengthening of its concentration and attention.

Also, the ultimate goal of every intervention is to strengthen the student's self-image and, by extension, his confidence. More generally, the priority of the Special Educator is the development of all those skills that can increase the quality of the child's daily life, but also cultivate their already existing inclinations and talents.

After starting a special education program, the primary goal is to evaluate the cognitive and learning abilities of each child.

The Special Educator, after taking into account all the elements of the diagnosis that the parents may bring from other therapists, uses various means in order to evaluate the overall profile of the child. Then, in collaboration with the interdisciplinary team of the child's therapists, a special, personalized learning intervention program is created, and adapted to its needs, abilities, and rhythms.

At what ages can the Special Educator start an intervention with the child?

Undoubtedly, the educational support of the Special Educator is necessary and useful whatever the age of a child with special (educational) needs may be. The usual age at which the Special Educator intervenes is as soon as the child starts Primary School. This happens

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because when the child is unable to successfully respond to the "requirements" of the school, then his difficulties begin to manifest themselves more intensely.

However, this fact also makes early detection necessary, as the eventual delay of an intervention often means that significant time has been lost for the child to master many skills.

The most appropriate age to start intervention with a child with special (educational) needs is around 3 1/2 years or even earlier. Of course, this presupposes that there have already been early signs both to the child's developmental level and to its behavior, which the parents have already noticed or for which they have already received a diagnosis from experienced specialists. Many times, it is possible for parents to receive guidelines from the Special Educator, in order to understand the existence of a possible "difference" in terms of their child's growth rate. Thus, in turn, the Special Educator can contribute to their referral to a Public Diagnostic Service in time.

In all cases, an early intervention becomes lifesaving, since when the child reaches a stage of psycho-emotional maturity, then he will be able to more flexibly adopt the appropriate way, that is, the way that suits him and helps him to learn.

However, even if an intervention is delayed, it is not useless to start because "it is never too late". The Special Educator can design programs even for teenagers. In the cases of people with mental retardation and severe or multiple disabilities, he can also work with adults, always prioritizing their priorities.

Finally, the educational programs designed by the Special Educator can also work preventively. By creatively exploiting the potential of each child (with or without special educational needs) and through playful experiential activities such as theatrical play, dramatization, role-changing, etc., it can help the child learn to organize space and time qualitatively, contributing, at the same time, to the improvement of his self-esteem.

(<https://www.mellonkriti.gr/o-rolou-tou-eidikou-paidagogou-kai-ta-ofeli-tis-eidikis-diapaidagogisis-sta-paidia/>, n.d.) Pinirtzi Vasileia Philologist – Special Educator (MEd)

Technologies and Special Education

Countries agree that access to appropriate ICT can reduce inequalities in Education and that ICT can become a powerful tool to support educational inclusion. On the contrary, inappropriate or limited access to ICT can increase the inequalities in education faced by some students, including students with special needs. The digital divide that could develop

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between educational systems (Eurydice, 2001, n.d.) can be considered extremely important for the field of Special Education. The countries propose that the role of those responsible for drawing up relevant to them ICT policy should be:

- the promotion of the basic training and education of teachers in the use of ICT.
- ensuring adequate infrastructure in mechanical equipment and software for all students.
- the promotion of research, innovations, and the exchange of knowledge and experiences.
- the awareness of the advantages of ICT in Special Education by the educational community and the wider society.

These goals can be achieved through the general and specific policy of Special Education, its plans, and programs. It can be argued that there is a need to shift the focus of ICT in Special Education policies and programs. The emphasis has previously been given to the ways (infrastructure in equipment and experience) that can make ICT more effectively applied in Special Education

Most countries now seem to be investigating how the policy emphasis should be on the outcomes – the aims and objectives of using ICT in Special Education and not just the ways in which ICT is used. Such a focus will help the discussions around the creation of the appropriate infrastructure but will focus even more on why and how ICT can be used more appropriately in a different educational environment.

Learning Objectives

Students with disabilities and/or special educational needs are considered those who, for the whole or a certain period of their school life, show significant learning difficulties due to sensory, mental, cognitive, developmental problems, mental and neuropsychiatric disorders which, according to a multidisciplinary assessment, affect the process of school adjustment and learning. Digital Technologies can be an effective tool to ensure equal access to all learners without exception at various levels of education and to protect their harmonious psychosocial development and progress. According to the World Health Organization (WHO): "Assistive Devices and Technologies are those whose main purpose is to maintain or improve functionality and independence, facilitate participation and enhance well-being."

In this context, the learning objectives of the course are, after the successful completion of the course, the student should be able to:

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- know and understand the basic concepts related to special education and training: the different types of disabilities, the policies and practices in the field of special education, and the teaching strategies used.
- analyze, evaluate, select, and document appropriate teaching strategies, digital educational content, and digital tools that support special education and training.
- know the different types of enabling technologies in supporting special education and training and be able to use the role of digital technologies in supporting special education and training.
- familiarize himself/herself with accessibility assessment tools and techniques.
- design, create, and document pedagogically appropriate technologically supported educational interventions with corresponding digital for special education and training.

The introduction of the computer in special education contributes to the achievement of key pedagogical and educational goals that touch both the purely educational process and the daily life and professional development of people with special needs (Jendron, 2008; Reed, 2001; Soulis, 2013, n.d.).

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Pedagogical Objectives

- Learning and teaching processes become more efficient.
- Enhancing learning and performance motivation.
- Providing knowledge and skills.
- Benefit from submission of alternative proposals and perceptions.
- Prevention of secondary effects due to disability.
- Compensation for malfunctions that may occur in various areas (e.g. alternative communication as compensation for speech and language problems).
- Improving the characteristics associated with learning and performance, as well as the person's personality in general.
- Rehabilitation through the activation, promotion, and practice of functions affected by the disability.

Goals related to daily living skills and vocational training

1. Education of people with disabilities in information technology.
2. Utilization of new IT and communication technologies in the daily life of people with disabilities.
3. Computer use during vocational training and vocational rehabilitation - work of disabled people.

ICT has evolved and continues to evolve rapidly affecting people's lives at an individual, interpersonal, social, and professional level and consequently their quality of life. "So, for an inclusive society, it is important to give the possibility to every citizen who wishes to participate in the digital transformation despite any individual or social disadvantages" (Tailachidis, 2013: 227, n.d.). In this context, the 21st Century Society for the Upgrading of

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the Educational System sets as a basis the conversion of education to the needs of the students. The modern school must create suitable conditions for all students to come into contact with new technologies and to use and utilize them according to their needs.

New Technologies for students with learning difficulties, autism, and ADHD

Students with learning disabilities and neurobiological disorders such as autism and attention deficit hyperactivity disorder (ADHD), seem to be able to be helped by the learning environment and the possibilities provided by new technologies if they are fruitfully integrated into the educational process (Hasselbring & Glaser, 2000, n.d.).

Students with diagnosed dyslexia are greatly facilitated by visual and auditory stimuli, the regular display of the text, and the varied activities it provides in a digital environment. In particular, tools such as the word processor Word help children with dyslexia to function freely without the stress of writing a text by hand. They feel a personal satisfaction in seeing the result which is a neat and neat text. In fact, they appear more receptive and willing to make corrections to their text, referring back to it with the sense of responsibility of the editor-author (Hasselbring & Glaser, 2000, n.d.). Word prediction software is one more tool for the dyslexic student that helps him express himself/herself in writing much more easily and with more confidence. The software, as it displays a variety of words with the placement of only the initial letter by the student, puts him in the selection process and provides him with the opportunity to use more difficult spelling words (Hasselbring & Glaser, 2000). The educational use of multimedia, because of the dynamic applications and audio and visual assistance, also significantly aids in the understanding of concepts and the development of the student's thinking, especially the dyslexic student whose knowledge in relation to his peers is more limited (Bransford, Vye, Kinzer, et al, 1990, n.d.). Students with dyscalculia can be helped by simulation games that involve them in dramatized situations of dealing with money (micro-markets) and confront them with basic arithmetic operations. For example, the Number Race software, exclusively designed for children with dyscalculia, aims to strengthen the representation of numbers, understand the relationships between them, and familiarize them with basic arithmetic operations, addition, subtraction, multiplication, division (www.thenumberrace.com, n.d.).

Regarding students with autism, "the computer offers the possibility of introducing the student into a controlled and predictable environment and that, if we seek, does not contain social stimuli. In this way, it helps the student with special needs to maintain his attention and concentration in an activity" (Pedagogical Institute, 2003, n.d.). As Jordan & Powell (1997: 170-171) argue "any person with autism, whether child or adult, can feel comfortable with computers and can develop a good relationship with someone else working on the computer with them". In particular, computers are considered the most suitable means for teaching people with autism, functioning as:

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- form bounded conditions.
- limit sensory stimuli.
- they have predictable and law-abiding behavior and are therefore controllable devices.
- do not penalize wrong answers.
- it is an educational tool that can be further improved.
- enable non-verbal or verbal expression (Jordan & Powell 1997:170-171, n.d.).

For children with ADHD, the use of computers in the educational process is an alternative effective educational strategy, on the one hand, because children with ADHD show dexterity in handling computers, and on the other hand because symbols and images stimulate their interest. However, the use of electronic games is not recommended as it has been observed that they cause an increase in their stimulation (<http://www.dyslexia-goneis.gr/view.asp?ItemID=83&ns=1&mcid=9&cid=23&scid=16&page=>, n.d., 4). The computer is very useful in classrooms with children with ADHD (Bender & Bender, 1996), as it has multiple functions. It serves as a knowledge object, a source of information, and a supervisory and communication medium, but also as a cognitive tool (Raptis & Raptis, 2001, n.d.).

The teacher can use the computer to present the teaching material in a more enjoyable way for the children with the help of graphics, images, and sounds that gain their attention, and involve the students in simulation activities (Mikropoulos, 2000, n.d.) that contribute to the construction of knowledge (Solomonidou, 2001, n.d.). Research has also shown that computer work helps children with ADHD symptoms increase attention, improve impulse control, and reduce hyperactivity (Carey & Sale, 1997; Slate, Meyer, Burns & Montgomery, 1998, n.d.).

New Technologies for students with mental retardation

New IT and Communication Technologies as well as software applications are key tools for the educational support of people with mental retardation. Studies conducted by Lancioni and his colleagues (Lancioni et al, 2013; Lancioni et al 2001, n.d.) showed that the use of computers as an educational strategy enhances the performance of students with mental

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retardation in school activities. Assistive technologies and the computer give people with mental retardation a great deal of autonomy so that they can achieve their school and subsequent social integration.

For example, by using specially configured keyboards, designed for people with special needs (fewer keys, keys with color or sound, alphabetical order of the letters on the keyboard, larger keys), children with mental retardation succeed first in using and then in expressing themselves through the PC, participating in the educational process (Fogarolo, 2007, n.d.). Accordingly, the use of the interactive whiteboard (possibility of touch, instead of a keyboard) in combination with educational software, specially designed to meet the educational needs of students with mental retardation (Fragaki & Papanastasiou, 2011, n.d.), help them to get involved in the educational process, which is the most important factor to acquire knowledge, since according to Bruner (1966) in the context of Discovery learning, knowledge is gradually discovered by children and through its active dimension becomes their property. Regarding the software, the following are indicatively listed that are used in the special education school units in Greece:

Painting software

- My home and school (for children with severe mental retardation)
- Rays (for children with moderate and mild mental retardation)



My home and school www.pi-schools.gr/specialeducation_new

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Σύνδεση με Αναλυτικό Πρόγραμμα*

α) Να μάθει το παιδί τα μέρη του σώματος.
β) Να μπορεί ο μαθητής να χρησιμοποιεί το σχετικό λεξιλόγιο για να κάνει περιγραφή του σώματος.
γ) Να γράφει απλές λέξεις (π.χ. τα μέρη του σώματος) ή και προτάσεις.
δ) Να μπορεί να διαβάσει απλές λέξεις και να αντιστοιχίσει λέξεις που ακούει (ακούει φθόγγων) με τις γραμμένες λέξεις (ακούει γραφημάτων).



Aktines www.pi-schools.gr/specialeducation_new

Consequently, appropriate online applications are available on the Greek website: www.sch.gr Finally, the contribution of digital games to the education of people with mental retardation is also key. Digital games enable repetition and practice, thus offering the student the opportunity to understand at his/her own pace of learning and according to his/her own time and mental capabilities. They are a more fun way of learning, which motivates the students and gives them the possibility to get to know, through them, aspects of their daily life, to read, to develop their vocabulary, and to make small purchases (Fytros, 2005, n.d.).

Of course, it is wise to always keep in mind that “It would be presumptuous to try to provide a valid prescription for all cases of students with mental retardation; it would be simplistic to think of finding common and repeatable pathways. Every path starts from the child, from the characteristics of the person, and from the environmental conditions in which he lives and immerses himself.

A child with mental retardation has abilities and limitations; he can and should make use of all possible aids to develop his skills and compensate for his difficulties; the computer and computer tools can perform this function if used properly.

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New Technologies for students with speech, hearing, vision problems, and severe physical disabilities

Another category of students with special needs is those who face speech and language disorders. Using appropriate technology can help these individuals interact within the classroom. When speech is absent or poor, the use of special devices called augmentative and alternative communication devices helps individuals overcome their communication problems (Hasselbring & Glaser, 2000). The use of these devices is particularly helpful for the educational process since it allows expression and participation to the student with speech disorders, but it costs a lot and this is the main reason why it has not been established as a trend in the educational field as a supporting tool for people with speech disorders (Hasselbring & Glaser, 2000). Today, of course, there are corresponding computer software and tools that are even more flexible and easy to use than stand-alone augmentative and alternative communication devices (Cohran P.S., 2000). There are also devices that incorporate synthetic or digital speech output and can be connected to the computer. The letter which read at a Software Publishers Symposium in 1998 by a young man whose PC was equipped with a text-to-speech device: “Until now, I've never had a voice or any other way to communicate. Until last year I was a student in a special school class. Now, I am in the eighth grade of a regular school. The computer was the best thing that happened in my life. Now people don't have to read my words. They can hear them like everyone else” (Hasselbring & Glaser, 2000: 111, n.d.)

Students who are also visually impaired need the assistance of support programs so that they can engage in the learning process inside and outside of school. Students with partial vision are helped by the use of the interactive whiteboard or the computer screen as these two media allow images and text to be enlarged (zoom). Regarding students who have no sight at all, there are programs such as the screen reader and the Braille Display that allow them to be more autonomous in their learning process (Fogarolo, 2007, n.d.).

Screen Readers are tasked to inform the blind person of what is displayed on the screen. It is a software that shows the content of the screen, using the voice synthesizer. The Braille Display converts the data it receives from the screen reader into Braille, allowing the user to read the content displayed on the PC screen line by line. The Optical Diagram Machine (Piaf Printer) is also a computer-independent device for the blind that produces relief graphics (Tailachidis, 2013, n.d.). The Braille 'n Speak machine is the most popular 'notetaker'.

It is a talking device with a rich range of functions that particularly help the student. It requires knowledge of braille, is based on seven keys, and includes a text editor (write, copy, paste) and the ability to store over 200 pages of braille text. Finally, Voice Navigation software that allows commands to be executed simply by voice recognition, and Braille Translation software that translates typed letters into embossed Braille characters, are very important learning tools for blind people (Tailachidis, 2013).



Braille 'n Speak device



A range of assistive tools, known as Hearing Aids, are available for those with hearing loss (partial or total). Of course, depending on the severity of the problem, each device or software is judged as suitable or not on a case-by-case basis. More generally, however, the use of assistive devices in combination with the use of the PC is considered imperative in teaching deaf students as it is a basic practice for the best possible understanding of the teaching material from the student's point of view and a channel of communication between the teacher and the deaf student. Some of the most common assistive devices that support the educational inclusion of deaf or hard-of-hearing students are:

- The two-way Buzzers. They are small portable devices used by the deaf as mobile phones instead of Short Message Service (SMS) and transmit messages to other buzzers or to/from computers (Tailachidis, 2013).
- For those who have hearing problems but don't have a total loss, Hearing Aids and FM Systems, systems that transmit sound using radio frequencies, help students to be actively involved in the educational practice (Tailachidis, 2013).
- Cochlear Implants, designed for people with severe hearing loss. These are implants that bypass the damaged parts of the inner ear and activate the nerves so that they receive signals when there is sound in the environment (Hasselbring & Glaser, 2000).

Regarding software for deaf and hard-of-hearing students, the Speech Viewer III program is typical and aims to provide visual feedback to deaf students for the acquisition of phonological awareness skills (Tailachidis, 2013). It converts the sound into an image and

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through various activities the deaf perceives visually and somatosensory the intensity of the phonemes, the duration, and the manner of pronouncing the phonemes. The use of video in education is particularly widespread, accompanied by subtitles or sign language translation, a practical aid for those with hearing impairments. At this point, an indicative reference will be made to the Greek data and the honorable efforts of the Pedagogical Institute to meet the educational needs of deaf students. So, a particularly interesting experimental software, the program, was created with **Handwritten Greek Sign Language** fonts in the context of teaching Greek Sign Language as a First Language (www.pi-schools/special_education_new). The chiral figures correspond to the 24 letters of the Greek alphabet and at the same time display the letter to which they correspond. Under each chiral form, the student sees the corresponding letter, so at the level of words or text these are given simultaneously in both the Greek and the digital alphabet.

				«Γραμματοσειρές Χειρομορφών ΕΝΓ»
γραφή: <u>μέρος του πίνακα)</u>				<p>Το πειραματικό εκπαιδευτικό υλικό «Γραμματοσειρές Χειρομορφών ΕΝΓ» δημιουργήθηκε στα πλαίσια του προγράμματος ΣΕΠΠΕ «Διδασκαλία της Ελληνικής Νοηματικής Γλώσσας ως Πρώτης Γλώσσας και Εξατομικευμένο Εκπαιδευτικό Πρόγραμμα για Κωφά Παιδιά» ΝΟΗΜΑ ΣΤΗΝ ΕΚΠΑΙΔΕΥΣΗ. Οι χειρομορφές που αντιστοιχούν στα 24 γράμματα του ελληνικού αλφαβήτου περιλαμβάνονται στη γραμματοσειρά YovrTypeU</p>  <p>και οι χειρομορφές που ταυτόχρονα εμφανίζουν και το αντίστοιχο γράμμα του Ελληνικού αλφαβήτου περιλαμβάνονται στη Γραμματοσειρά MyTypeU.</p>  <p>Α Β Γ Δ Ε Ζ Η Θ Ι Κ Λ Μ Ν Ξ Ο Π Ρ Σ Τ Υ Φ Χ Ψ Ω</p> <p>Με την γραμματοσειρά MyTypeU έχετε την δυνατότητα να βλέπετε</p>
A	Α	0	0	
B	Β	1		
C	Γ	2	2	
D	Δ	3	3	

ENG Handwriting Fonts www.pi-schools/special_education_new

Technology can therefore be an important help for deaf or hard-of-hearing students. After all, let's not forget that the most widespread high-tech device, the telephone, was originally made for hearing-impaired people. Alexander Graham Bell invented the telephone to help his deaf sister (Hasselbring & Glaser, 2000).

Concerning the training of SEN in the use of the PC and by extension ICT and supporting technologies, perhaps the most important thing is the student's familiarity with the PC and especially the mouse. Especially for people with severe physical disabilities such as mobility problems, this is particularly difficult. For this purpose, tools such as the joystick and the trackball help students with mobility disabilities to work on the computer and benefit from it (Tailachidis, 2013). Also, the Electronic Pointing Devices are an easy-to-use and particularly useful tool for people with multiple disabilities, mainly of a motor nature, which allows the

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control of the screen sensor without the use of hands or other parts of the body, but is based on ultrasound or infrared technologies and recognizes eye movement or brain waves. There is also a case where a pointing device is activated by the inhalation and exhalation of the user through lip pressure (http://www.e-yliko.gr/htmls/amea/amea_tools_.aspx, n.d.).

"Electronic pointing devices give amazing advantages to A.M.E.E.A.s. who use them because they can now say their needs, express their feelings and emotions, ask questions of others, participate in school activities, play, maybe even work, take part in decisions about the future them, to improve their relationships with their family and friends" (Tailachidis, 2013: 235-236).



Trackball pointing device

(<https://www.scientific-journal-articles.org/greek/free-online-journals/education/education-articles/markou-paraskeui/paraskeui-markou-markos-athanasios.htm>, n.d.)

Idea - Design - Printed Item

More specifically, in mathematics, students with or without educational needs can understand geometric solids, fractions, volume, area, symmetry, patterns, and pre-education with the help of new digital tools, such as the 3D printer and the 3D scanner. Students can be helped with three-dimensional objects – special rulers that help focus attention when reading a text. With 3D designing programs, they can create their own designs and fill in outlines and thus cultivate their glyph and motor skills. In the history lesson, they can scan monuments of their place and print them or even come into direct contact with 3D printable monuments of world cultural heritage. In the geography lesson, they can create 3D maps-puzzles with printable pieces of countries or cities. Finally, students can use their imagination to make useful everyday objects that will beautify or make their lives easier (e.g. a pencil case or a potholder).

What is certain is that this technology is here to stay and we will encounter it more and more in all aspects of our daily life. It is an industry that will become established because it will be used more and more in almost all professions. The ability to introduce children to its use from an early age will be an advantage for their future educational and professional careers, something easily recognized by parents, i.e. your customers. It also combines learning with entertainment in a truly impressive way, fosters student creativity, fosters

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collaboration and critical thinking, and is sure to keep students of all ages engaged. The fact that it is a new innovative branch is at the same time its great advantage, as its utilization and inclusion in the educational plans of a modern school is a huge economic opportunity and something that will perhaps be a decisive factor in differentiating you from the competition and a means of breaking free from the current economic situation.

3D printing beyond its practical possibilities, has the added commercial advantage of sensationalism and its high recognition and exposure by the media, which has cultivated curiosity and interest in the world (Anon., 2024).

Summary

Various definitions have been formulated from time to time in order to determine the content of Special Education, however today the use of a specific one is avoided because it is considered that each student with Special Needs should be perceived as a separate and multifaceted personality and not characterized based on some obvious or his non-disability.

Of course, the student's disability still exists and is taken into account by the teacher and the competent bodies, in the formation of the educational program, but his personality is no longer characterized as "deviant", but as respected (Zoniou-Sideri, 2000, n.d.). At the same time, with the term Special Education we refer to a branch of the Humanities whose object is the systematic study of the characteristics and clinical profile of children with Special Educational Needs, as well as the intervention aimed at eliminating or mitigating the difficulties arising from them (Stassinis, 2016).

But who are children with special needs? By this term, we refer to children or adolescents who differ significantly from the average compared to their peers, as a result of which they need an individualized program of instruction or special intervention in order to obtain the greatest possible benefit from their education (William Lee Heward, 2009, n.d.).

This category includes children with disabilities and sensory disorders, learning difficulties, behavioral problems, and pervasive developmental disorders, as well as those who have a special talent, the gifted, or those who come from cultural minorities or marginalized areas (William Lee Heward, 2009; Stassinis, 2016).

However, some reject the use of this term, considering that it does not faithfully convey what it seeks to define, since it is simply a faithful translation of the corresponding English term, it doesn't give the necessary emotional charge and it hides the difficulty of the acceptance of people with disabilities by the wider social environment (Zoniou-Sideri, 2000, n.d.). Many of these children now attend the regular school in their neighborhood, in the

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context of Inclusive Education, and are treated as equals with their classmates, enjoying equal educational and social opportunities.

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3.2. National Educational System – ITALY

Main characteristics of the education and training system in Italy

Administration and management

Education and training are structured following the principles of subsidiarity and autonomy.

The state has exclusive legislative authority for general education regulations, which include setting core performance levels, managing school personnel, and state financial resources. The Ministry of Education and Research and the Ministry of University are in charge of the administration of education nationwide in their respective sectors. The Ministry of Education is structured through the Regional School Offices (USR), which ensures the implementation of general directives and compliance with the essential levels of performance and standards in the different regions.

The Ministry of Education and Merit (MIM) is assigned the functions and tasks pertaining to the State in the field of School and University Education and higher artistic, musical, and dance training, as well as scientific and technological research. In these three main channels of intervention, except for the areas of competence reserved for other bodies and organizations, the Ministry carries out regulatory, support, and valorization functions of the autonomy recognized by schools, Universities, AFAM, and research institutions.

The Regions hold shared legislative competencies in certain sectors of education, such as the organization of the integrated 0-3 system, the school calendar, the school network, and the right to study for Higher Education. Furthermore, the Regions have exclusive legislative competence regarding the vocational education and training (IeFP) system.

The local authorities are responsible for organizing educational provision, which ranges from pre-primary to upper secondary education (e.g. managing school buildings, establishing and merging institutions, and planning school transportation).

Educational institutions enjoy a considerable degree of autonomy as they are responsible for defining the curriculum, expanding the educational offering, and organizing teaching activities, including teaching times and student placement. Every three years they develop their own Three-Year Training Offer Plan (PTOF).

At the tertiary level, the Universities and institutions of higher artistic, musical, and dance education (Afam) together with the Higher Technical Institutes (ITS Academy) enjoy statutory, didactic and organizational autonomy (Eurydice, 2022).

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Providers

The Italian education system is predominantly managed by the State, with the possibility for public and private bodies to establish educational institutions. Non-state schools can be private or non-private, the latter are not authorized to issue qualifications.

State schools are financed directly by the State, while private schools receive contributions based on the criteria established annually by the Ministry of Education.

Parental education is only permitted under certain circumstances. Students who follow this type of education must sit specific exams to keep on with their educational path or to re-enter the state school system.

Italian school legislation

The last major school reform in Italy was the so-called "Buona Scuola", officially known as Law 107/2015, promulgated by the Italian government in 2015. This reform introduced a series of changes in the Italian school system in order to improve the quality of education and promote the autonomy of schools.

Some key points of the "Good School" law include:

1. Teacher evaluation: A teacher evaluation system based on objective criteria has been introduced, which takes into account the results obtained by students and other factors.
2. School autonomy: Schools have obtained greater autonomy in financial, organizational, and educational management. This allows them to adapt the educational offer to the specific needs of students.
3. Strengthening technical-professional education: Greater emphasis has been given to technical-professional education, with the aim of preparing students for the job market.
4. Teaching of civic education: The teaching of civic education has been introduced as a compulsory subject in all schools, in order to promote awareness and a sense of responsibility in future generations.
5. Digitalization of schools: The introduction of new technologies in teaching and learning was promoted in order to encourage innovation and improve access to teaching resources.

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Inclusion

Education at all levels should be accessible to every individual, both Italian citizens and EU and non-EU foreign minors. Furthermore, compulsory education is provided free of charge.

The principle of inclusion and the right to support has also been extended to students with disabilities and with either social or financially disadvantaged backgrounds. In such circumstances, inclusive strategies focus on personalizing education and teaching flexibility. For immigrant students with limited competencies in the Italian language, adequate linguistic support is also provided.

In addition to the above, the State also ensures the right to education to students who are unable to attend school due to hospital admissions, long illnesses, or detentions, if over the age of 14, as provided for in the 'Organizational variants and alternative structures in secondary education'.

The levels of the education system

The Italian education and training system is divided into the following levels: pre-primary (0-3 and 3-6 years), Primary, Lower and Upper Secondary Education, Post-Secondary Education, and Higher Education.

Early childhood education and care

The education and care of pre-school children, i.e. under 3 years of age, are provided through educational services dedicated to childhood, such as nurseries, micro-nurseries, play spaces, centers for children and families, as well as services provided at home.

Education and care for preschool children, between 3 and 6 years old, are provided by nursery schools.

Both constitute the "0-6 integrated system" of education, which is part of the education and training system and is not compulsory in nature. Educational services intended for children in the 0-3 age group are organized by the Regions in accordance with specific regional laws, following the general framework defined centrally by the Ministry of Education and Research. The Ministry also holds responsibility for preschool education for children between the ages of 3 and 6.

The 0-6-year-old system includes various educational services for children, managed by local authorities or other public or private entities. Among these services, there are the nurseries and micro-nurseries, which welcome children from 3 to 36 months, the spring sections, which welcome children from 24 to 36 months and are aggregated to nursery schools, and the supplementary services which offer different ways of functioning, such as play spaces for children from 12 to 36 months, centers for children and families and educational services in a home context.

Nursery schools, both state and private, are part of the integrated system and welcome children aged three to five. Nursery school contributes to the education and emotional, motor, cognitive, moral, religious, and social development of children, promoting their potential in terms of relationships, autonomy, creativity, and learning. Furthermore, the nursery school supports the integral education of children, guaranteeing educational continuity with the nursery and primary school.

The children's centers are a novelty introduced by the 2017 legislative decree. These centers bring together facilities for children aged 0 to 3 and 3 to 6 in a single building or in nearby buildings, allowing for better sharing of services, spaces, and resources.

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The operating hours of the nursery school are 40 hours per week, with the possibility of extending up to 50 hours. The nursery school sections can be homogeneous or heterogeneous in age and can accommodate a variable number of children, with a minimum of 18 and a maximum of 26 children.

The educational and didactic activities of nursery school are based on five fields of experience: the self and the other, the body and movement, images, sounds, colors, speeches and words, and knowledge of the world. Through action, exploration, play, and comparison with others, children develop their skills in these fields.

The teaching methodologies of nursery school favor concrete experience, exploration, discovery, play, and conversation between peers and adults. The activities are organized in such a way as to promote the well-being of the children and their peaceful learning. The assessment is used to recognize, accompany, describe, and document the growth processes of each child.

In conclusion, the Integrated Education and Education System 0-6 is committed to guaranteeing all children equal development and learning opportunities, promoting educational continuity, and the inclusion of all (MIM, 2024).

Compulsory education

Compulsory education in Italy has a total duration of 10 years, from the age of 6 to 16. According to Ministerial Decree 139/2007, compulsory education is divided into the following school levels:

- Five years of Primary School, which is the first cycle of education.
- Three years of Lower Secondary School, which corresponds to the second cycle of education.
- Two years of Secondary School, which represents the third cycle of education.

The last two years of obligation, from the age of 14 to 16, can also be completed through regional education and professional training courses, as required by law 133/2008.

The compulsory education can be fulfilled by attending both state schools and private schools. In certain circumstances, it is also possible to fulfill the obligation through parental education or in non-equal private institutions. The State guarantees the right to study and the fulfillment of compulsory education even to hospitalized or detained students.

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In addition to compulsory education, all young people have the right/duty to receive education and training for at least 12 years or until they obtain a three-year professional qualification by 18 years of age, as established by Legislative Decree 76/2005.

Furthermore, young people aged 15 can complete the last year of compulsory education through an apprenticeship contract, subject to an agreement between the Regions, the Ministry of Labor, the Ministry of Education, and the social partners, as required by law 183/2010.

Compulsory education refers to both enrollment and attendance. Parents are responsible for ensuring attendance and compliance with the obligation. The local authorities where the pupils reside and the school directors of the institutes, they attend have the task of supervising the fulfillment of the obligation.

Those who do not continue their studies at the end of the compulsory education period receive a declaration attesting to the fulfillment of the compulsory education and a description of the skills acquired during the school career.

The provisions on compulsory education apply to both Italian citizens and citizens of European Union member states and to non-EU citizens of compulsory education age.

The first cycle of education

The first cycle of education is compulsory and includes Primary School and Lower Secondary School.

Primary School begins at the age of 6 and lasts for five years. On the other hand, Lower Secondary School begins at the age of 11 and lasts three years.

There are no exams during the transition from Primary School to Lower Secondary School. At the end of the first cycle, students face a final exam which, if passed positively, allows them to continue into the second cycle of education, where the first two years are compulsory.

Primary school is the first compulsory education cycle, lasting five years, which is part of the national education system. It aims to provide girls and boys with the fundamental knowledge and skills to develop basic cultural skills and promote full personal development.

Primary School aims at the acquisition of basic learning as the first exercise of constitutional rights. Through the different disciplines, it offers the opportunity to develop the cognitive, emotional, affective, social, bodily, ethical, and religious dimensions of children. Primary

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School is committed to providing essential knowledge and preparing children to become aware and responsible citizens, capable of reflective and critical thinking.

Attendance at primary school is compulsory for all girls and boys living in the national territory who have turned six years old by 31 December of the reference year. It is also possible to enroll girls and boys who turn six by April 30th of the relevant school year, upon request. Enrollment in state primary schools takes place via an online form, while private schools can voluntarily join the online enrollment system or register in paper form at the institute.

The weekly lesson time in primary school can vary from 24 to 27 hours, extending up to 30 hours based on the availability of teacher staff. It is also possible to request full-time 40 hours per week if there are places and staff available. Individual educational institutions define the organization of the school timetable as six or five days a week, with or without afternoon returns.

Primary School classes are normally made up of a minimum of 15 students and a maximum of 26 (or 27 in particular cases). If the number of enrollments does not allow for a class of 15 students, it is possible to activate multiple classes, which accommodate between 8 and 18 students. In some particular situations, such as small islands, mountain municipalities, or areas inhabited by linguistic minorities, it is possible to set up classes with at least 10 students.

In Primary School, various subjects are studied, including Italian, English, History, Geography, Mathematics, Science, Music, Art and Image, Physical Education and Technology. The teaching of Civic Education is also provided, introduced with a 2019 law. Pupils who wish can also follow the teaching of the Catholic Religion, while others can choose between studying an alternative subject or assisted individual study (MIM, 2024).

The evaluation of pupils' learning involves the assignment of a descriptive judgment to the degree of achievement of the learning objectives of each discipline, including the teaching of Civic Education. The assessment is carried out on four levels: first acquisition, basic, intermediate, and advanced. Each school develops its own evaluation criteria and the Evaluation Document also contains a description of the process and the global level of learning development, as well as a summary judgment on behavior.

The evaluation of learning has a formative function and is an irreplaceable tool for constructing teaching decisions.

The teachers evaluate, for each student, the level of acquisition of the individual learning objectives identified in the annual planning and approved by the Teaching Committee. Four learning levels have been identified: advanced, intermediate, basic, and in the process of first acquisition. The levels are defined on the basis of four dimensions: autonomy, type of

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situation (known and unknown), resources mobilized to complete the task, and continuity in the manifestation of learning. The evaluation of pupils with certified disabilities is expressed with descriptive judgments consistent with the individualized educational plan. Similarly, in the case of pupils with other special educational needs, the learning levels of the disciplines adapt to the objectives of the specific planning, developed with the individualized teaching plan.

The transition to Lower Secondary School, at the end of the fifth year, no longer requires an exam. Students receive a certification of the skills acquired over the five-year period.

Lower Secondary School is a three-year educational path that follows Primary School. It aims to strengthen basic literacy across the different study disciplines, promoting an integrated vision of knowledge and developing transversal skills.

The Lower Secondary School promotes:

- the organization of knowledge across different disciplines, which allows students to interpret and represent the world in different ways.
- the development of disciplinary and transversal skills, which allow students to fully realize themselves and actively participate in social life.
- study autonomy and social interaction, encouraging students to be protagonists of their learning and to build their own life plans.
- literacy and the in-depth study of information technologies, in relation to cultural tradition and the social, cultural, and scientific evolution of contemporary reality.
- the acquisition of awareness of one's potential and resources, carrying out an educational and orientation role for the subsequent education and training path.
- the study of the English language and a second language of the European Union.

The mandatory annual lesson time is 990 hours, corresponding to 29 hours per week plus 33 hours per year of in-depth study of literary subjects. It is possible to organize long-term classes with a timetable of 36 hours per week, which can be increased up to 40 hours including the time dedicated to the canteen.

The first classes of Lower Secondary School are normally made up of a minimum of 18 students and a maximum of 27 (28 in the case of remainders). If only one first class is formed in the school, the number of students can reach up to 30. In specific areas, such as small islands, mountain municipalities, and areas inhabited by linguistic minorities, it is possible to set up classes with a minimum of 10 students. In these areas, if the numbers to form separate first, second, and third classes are not reached, it is possible to activate classes with students from different years of the course, who however must not exceed 18 students.

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Classes that welcome students with serious disabilities are normally made up of no more than 20 students.

The compulsory study disciplines for Lower Secondary School students are:

- Italian
- English language and second community language
- History
- Geography
- Mathematics
- Science
- Music
- Art and Image
- Physical Education
- Technology

Furthermore, the teaching of Civic Education included a variety of topics such as the Constitution, sustainable development, and digital citizenship. Students can also choose to follow Catholic Religion teaching for one hour per week, but can also opt for an alternative activity or supported individual study.

It is possible to activate musical courses, which add the study of a musical instrument and musical practice to the study of traditional disciplines. Interested students must take an orientation-aptitude test to evaluate their aptitude and direct them to the specific instrumental specialty.

The evaluation of learning takes place through marks in tenths which indicate the different levels of learning in each study discipline. The evaluation of the teaching of the Catholic Religion and alternative activity is carried out in a separate note.

The second cycle of education

Second-cycle education begins from the age of 14 and offers two distinct paths:

- Secondary School
- the regional vocational education and training (IeFP) system.

The first two years of the second cycle are part of compulsory Education.

The secondary school offers both general courses, such as High Schools, and professional courses, such as technical and professional institutes. Each path lasts five years.

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Here are some of the main institutes present in Secondary Schools:

1. Artistic High School: This institute offers a course of study focused on visual arts, graphics, painting, and sculpture. Students acquire artistic and creative skills, as well as a solid general cultural education.
2. Classical High School: Classical High School focuses on the study of classical languages (Latin and ancient Greek) and Humanistic Disciplines such as Literature, Philosophy, Art History, and Ancient History. This course of study provides a solid cultural foundation and prepares students for university studies in the humanities.
3. Linguistic High School: This institute focuses on the learning of foreign languages, with particular attention to knowledge of the cultures and literatures of the countries of reference. Students study at least three foreign languages and develop advanced communication skills.
4. Musical and Dance High School: This institute offers a course of study dedicated to music and dance. Students can specialize in a musical instrument or dance, in addition to following a liberal arts curriculum.
5. Scientific High School applied sciences option: This institute focuses on the study of Scientific Disciplines such as Mathematics, Physics, Chemistry, and Life Sciences. The applied sciences option involves an in-depth study of subjects such as Information Technology, Biotechnology, and Electronics.
6. High School of Human Sciences, economic-social option: This institute offers a course of study that integrates Humanistic and Social Disciplines with elements of Economics and Law. Students acquire knowledge and skills in the fields of Social Sciences, Educational Sciences, and Economics.

In addition to High Schools, there are also technical and professional institutes. The technical institutes offer study courses linked to Economic and Productive Sectors, crucial for the country's development. Professional institutes, on the other hand, train students in arts, crafts, and professions that are strategic for the Economy.

Finally, a new training chain called "Technological Professional 4+2" was introduced. This course, lasting six years, aims to provide students with training that is close to the needs of the world of work and facilitates the continuation of studies in the Tertiary Education Courses of the ITS (Higher Technical Institutes), with the achievement of qualification of High Technical Specialization.

Upon completion of Upper Secondary School, students who successfully pass the final state exam, obtain a diploma that allows access to Tertiary Education.

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The vocational education and training (IeFP) system is managed at a regional level through three- and four-year courses offered by accredited training institutions or secondary education institutions. At the end of these regional courses, a qualification is issued which allows access to second-level regional training courses or, in certain circumstances, to the ITS Academy (Higher Technological Institutes).

Tertiary education

The following institutions offer Education at the tertiary level:

- Universities and institutes authorized for equivalent qualifications
- Institutes relating to higher artistic, musical, and dance education (Afam)
- Higher technological institutes (ITS Academy)

To access Higher Education, it is necessary to have a secondary school diploma. The admission criteria are defined by the Ministry of University and Research and by the individual institutions.

Access to Higher Technical Institutes also occurs through a four-year course in the context of the regional professional training system, followed by a year of a dedicated supplementary course. Recently, ITS have undergone a significant reform, the main details are illustrated in the chapter on current reforms in Higher Education, awaiting the publication of the decrees that will establish their organization.

Adult Education and Life-Long Learning

In Italy, the concept of "Life-Long Learning" has been supported and promoted by various laws and policies. These measures aim to encourage people of all ages to continue learning and acquiring new skills throughout their lives.

Some of the relevant laws and initiatives promoting "life-long learning" in Italy include:

1. Law 92/2012: This law, known as "Labor Market Reform", introduced several measures aimed at promoting Lifelong Education and Training. Among these measures are the "Higher Technical Education and Training Courses" (IFTS), offering post-diploma training programs, and the establishment of the "National Agency for the Administration and Allocation of Funds of the European Social Fund" (ANADFE) for the management of European funds for education and training.

The concept of Adult Education (IDA) refers to the set of educational activities aimed at obtaining a qualification in adulthood. This sector falls under the competence of the Ministry and is financed with public funds, guaranteeing free entry for participants aged 16 and over. Formal adult Education is managed by the Provincial Centers for Adult Education (CPIA) and higher education institutions.

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The provision in the adult education system includes:

- First-level paths (developed by the CPIA) aimed at achieving the high school diploma and obtaining the certification attesting to the basic skills acquired at the end of compulsory education in the professional and technical education sector.
- Second-level courses, designed by Secondary Schools, aimed at obtaining a technical, professional, and artistic education diploma.
- Paths dedicated to literacy and learning of the Italian Language for foreign adults, aimed at obtaining a certification attesting to the achievement of linguistic skills not lower than level A2 of the European Framework of Reference for Languages, offered by the Provincial Centers for Adult Education (CPIA).

Courses are also available in places of detention.

Education and instruction in a home context

Home-based education services and parental education are two alternatives to traditional education offered in certain contexts and circumstances. Both models are based on the idea that Education can take place outside of a traditional school environment, adapting to the specific needs of children and families.

Educational services in a home context are recognized by law 107/2015 as one of the options available for the educational assistance of children under the age of 3. These services aim to meet the needs of families through a flexible structure and organization. The children are welcomed in small groups and are entrusted to one or more educators. The responsibility for organizing and monitoring these services lies with the regions and local authorities.

On the other hand, parental education allows pupils to fulfill the obligation of education through the teaching provided by their parents. According to current legislation, during compulsory education (up to the age of 16), parents can opt for parental education at any time during the school year. However, they must demonstrate that they have the technical and economic skills to provide adequate education independently. Parents must submit a communication to the head teacher of the school closest to their residence, without requesting specific authorization. This communication must be renewed annually.

Pupils who choose parental education must take an eligibility exam every year to confirm the path undertaken and to be admitted to the final state exam of the first education cycle. This exam aims to evaluate the skills acquired by pupils through parental education and to

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ensure compliance with compulsory education. Parents must draw up a study plan in line with the national curriculum guidelines established at the central level.

After completing compulsory education, students can choose to return to mainstream education through an eligibility exam. Alternatively, they can continue their studies through parental education or at private institutions. In this case, they can also take the final state exam of the second cycle of education as external candidates, as required by national legislation.

It is important to underline that home education provided by school teachers for health reasons does not fall into the category of parental education, but is a specific service offered to students who cannot attend in-person lessons due to health problems.

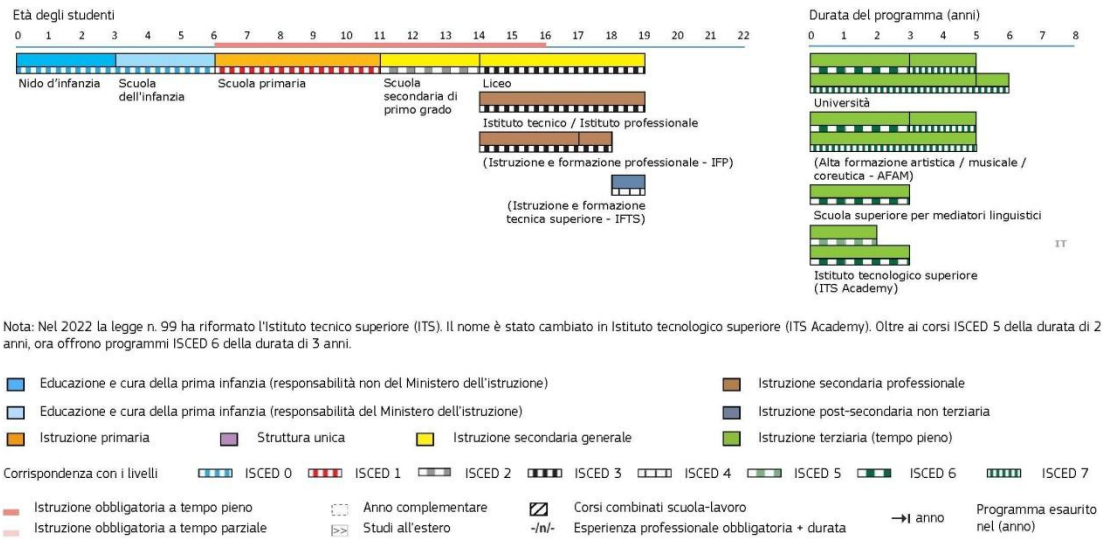
In the 2021/2022 school year, the number of students who chose parental education was 11,363 in Primary School, 6,122 in Lower Secondary School, and 1,972 in Upper Secondary School, according to data from the Ministry of Education. Education and Merit.

In conclusion, home-based educational services and parental education are valid alternatives to traditional education, offering flexibility and adaptability to the needs of children and families.

Structure of the Education and Training System

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Italia – 2023/2024



Fonte: Eurydice.

(Eurydice, 2022)

Inclusion in the Education and Instruction System in Italy

Introduction

In Italy, over the last fifty years, a process of inclusion in the school system has been started, which is still ongoing. Much has been done, but there is still much to do. This process began in 1971 with the introduction of the concept of integration and expanded in 1992 with Framework Law n.104. However, the origins of this process can be traced back to earlier periods, as supported by the Italian Constitution of 1948 which states that school is open to all. Despite this, the actual opening of the school was limited by conditions that prevented all students from participating. Today, it is recognized that integration and inclusion are fundamental rights and ethical principles for every individual. The school system and the academic world are called to face the complex challenge of inclusion. This challenge requires systemic responses for the entire school community and specific responses for each student. Furthermore, there are uncertainties regarding the need to define tools for monitoring inclusion, developing good practices, and reflecting on training paths for teachers.

Educational regulations and research have played an important role in developing schools' responsibility for including the most vulnerable students. According to Canevaro, the quality of a school system is manifested through the inclusion of all students, including those with greater difficulties. Historically, school inclusion has gone through various phases, moving from total exclusion to inclusion in special schools, from selective integration to the current perspective of inclusion for all, with increasingly welcoming and participatory approaches for each student (Canevaro, 2011).

In Italy, the regulatory mosaic of laws and decrees has led to a vision of the school as an environment of sharing and active participation for all. The legislative path towards an inclusive perspective has been characterized by several significant stages, mainly concentrated between 1971 and 1992, and between 2007 and today.

The experience of inclusion in Italian schools went through four phases:

1. The period of exclusion, which lasted until the 1970s, after the implementation of the Gentile Law.
2. The period of inclusion, in which the school was not yet ready and there was a lack of specialized figures to implement the laws of the 70s.
3. The period of integration, which began with the promulgation of Law 104/92 and related decrees, favored fruitful collaboration between schools and local services. This period allowed only "certified" individuals to receive an education that recognized their needs.
4. The period of inclusion, still in progress, which represents the objective to be achieved through recent regulations and a flexible procedural process.

The Italian model of school integration and inclusion has become a point of reference for the development of inclusion policies in Europe and beyond. This model has contributed to making school a place of knowledge, progress, and empowerment, where the focus is increasingly on inclusion rather than selection.

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In Italy, all individuals have educational needs that must be accommodated by schools. However, this shared perspective has not always been evident. A process of social and political changes was necessary for pupils to fully participate in an education system capable of meeting their needs.

The path towards school inclusion in Italy began in the 20th century, but it has not always been linear or satisfactory. Before this period, educational institutions had not even considered the treatment of diversity.

The first regulations on the attendance and compulsory schooling of pupils with disabilities date back to 1923, with the so-called "Royal Gentile Decrees". These decrees extended compulsory schooling up to 14 years of age for all pupils who did not have "abnormalities that prevent compliance", but in reality, only expanded participation for pupils with sensory impairments such as the deaf and blind. The concept of "differential classes" was introduced for the first time in elementary schools, intended for pupils with "developmental abnormalities" (Sibilio, 2003).

Schooling was provided mainly in separate institutions called "Special Schools", which were physically separated and offered different programs than schools for able-bodied pupils. This segregation led to a phase of exclusion.

The regulations of that period, despite trying to regulate education for pupils with disabilities, had a mentality clearly oriented towards exclusion and segregation. For example, the Royal Decree of 5 May 1925 provided school directors with the ability to exclude pupils suffering from contagious or repugnant diseases, not just those with physical or mental disabilities.

In the following years, the Royal Decrees of 1928 led to the medicalization and institutionalization of pupils with differences. For example, Royal Decree no. 577 of 5 February provided for the extension of compulsory schooling up to the age of 16 in special institutes, while Royal Decree no. 1297 of 26 April allowed the definitive removal of students with indiscipline problems resulting from presumed mental abnormalities.

Also, Royal Decree n. 786 of 1 July 1933 established special elementary schools for children suffering from contagious diseases, "abnormal children" and physically handicapped children. These schools were run by teachers with special qualifications or particular skills.

This phase, defined by historians as the "exclusion phase", officially lasted until 1933, but continued more or less openly until the 1960s (D'Amico, 2010).

Despite the promulgation of the Constitution after the proclamation of the Republic, which emphasized equality and free access to education, the educational principle of equity and recognition of diversity has been neglected.

The responsibility and care of pupils with special needs have been entrusted mainly to special institutes, often of a religious or medical-psycho-pedagogical nature. Public schools have distanced themselves from this problem, entrusting its resolution to others. This period was also characterized by "medicalization", in which the dominant approach was medical

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and attention was focused on the individual's deficit, considered a problem to be contained to protect the teaching activity of "normal" pupils.

The first step by the State towards recognizing the needs of pupils with disabilities took place in 1947 with Circular no. 6676/87 of the Ministry of Education. This circular defined both the methodology and the organizational aspects for the creation of differential classes. In that period, due to the consequences of the war, many children suffering from physical, sensory, and mental handicaps needed education. As a result, special schools and differential classes were created. Differential classes were not separate educational institutions, but functioned within mainstream primary schools and accommodated pupils with behavior problems, retardation, or instability who did not adapt to traditional discipline and teaching methods. Educational attention focuses on the individual's specific deficit, and the teacher relies on the indications of the specialist doctor to provide teaching suited to the student's difficulties (Celli, 1994).

This approach confirmed the separation between "disabled" and "normal" pupils and attributed a fundamental role to medical specialists, who provided the diagnosis and the label that indicated which type of teaching was most suitable for the pupil with difficulties. The certification of the handicap therefore became a pass for special structures, instead of being an indication to start a recovery process in the mainstream school. In this way, the logic of the separation between "disabled-sick" and "normal-healthy" pupils was confirmed.

With Ministerial Circular no. 771 of 03/01/1953, there was a strong increase in special schools and differential classes. This document provided clear guidance on the differences between the two institutions and on sending pupils to one of them. Special schools were separate institutions where primary education was provided to children with specific physical and mental impairments. Differential classes, however, functioned within mainstream primary schools as separate spaces but within shared contexts. In these classes, special education was provided to late, nervous, unstable pupils, who revealed difficulties in adapting to common discipline and traditional teaching methods.

Until the 1960s, ghettoizing terminology such as "the abnormal", "the subnormal", "the irregular", or "the handicapped" was used to define the category of the current disabled. The school inclusion of disabled children was characterized by a predominantly medical approach and widespread marginalization and institutionalization (Cottini, 2008).

In the 1960s, the State began to take a direct interest in pupils with educational needs, strengthening and diversifying special structures. Law no. 1073 of 07/24/1962 established the establishment of differential classes in state schools and special state schools also in smaller municipalities. In the same year, Law no. 1859 of 31 December 1962 provided for the possibility of establishing differential classes even in state Middle Schools, subject to the favorable judgment of a medical-psycho-pedagogical commission.

In 1968, Law No. 144 of 18 March established special sections for students with disabilities in Nursery School and established that disabled people could successfully attend the first class of Middle School in groups of no more than 15 units. This was also the year in which diversity was recognized as a resource to be socially integrated, respecting the principles of

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social equality, to restore the dignity of disabled people and encourage their inclusion in school and the world of work (Sibilio, 2003).

At the end of the 1960s, the ideological and political movement of protest undermined the segregating culture of special schools and called for the implementation of the rights already enshrined in the Constitution, in particular, the principle of "formal and substantial equality". In this period, important legislative measures were enacted in both the social and scholastic fields (Nocera, 2001).

Regulatory evolution

After 1970, it was recognized that the problem of disabled people needed to be addressed seriously. The inclusion of disabled pupils in mainstream schools occurred in a context in which the school was criticized for authoritarianism, discrimination, and selection.

The inclusion represented progress towards the physical presence of disabled students in the school, overcoming the physical separation that excluded them in the past. Although it was not an advanced educational achievement, it was still a significant step. The opportunity to interact with non-excluded people allowed us to get to know subjects who were identified only by their disability in a new way.

However, the inclusion of disabled pupils in mainstream schools since the 1970s has been described as "wild" because it was not accompanied by adequate preparation of the environment. The school facilities were not adequate and the preparation of the teachers was lacking. Furthermore, there was often opposition from parents of pupils considered "normal" who saw inclusion as a decrease in the quality of the school. The teachers themselves sometimes showed an attitude of unavailability (D'Alonzo, 2008).

The disabled student had to be considered in his individuality, with his shortcomings but also with his growth potential. The merit of the inclusion was to initiate processes of integration and improvement of the dynamics of adaptation between the individual subject and the school environment. However, there is still a lot of work to be done to move from inclusion to integration through a flexible school organization that is attentive to the needs of each individual pupil, based on welcoming and valorizing diversity as a resource for all.

The path towards inclusion was long and complex, with a series of regulatory provisions that were introduced starting from law 118/71 approved in 1971. This law recognized the right to Education of disabled students in normal public-school classes and guaranteed services such as transport, accessibility to school buildings, and assistance during school hours for the most serious students. However, this law was partial because it only addressed some forms of disability and did not explicitly mention the concept of integration. Furthermore, it did not address the pedagogical and didactic organization relating to inclusion, focusing mainly on social and health services (D'Alessio, 2011; Nocera, 2001).

Finally, the inclusion of disabled students in mainstream classes was achieved with law 118/71, which facilitated the access of disabled people to secondary schools, universities, and all educational institutions. This law represented an important challenge for the civil, social, and cultural growth of our country, allowing the integration of all pupils, including those with disabilities, who in the past were relegated to separate institutions such as special schools or differential classes (Canevaro, 2009).

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With the approval of Law 118 in 1971, we moved from the medical-rational perspective to the constructivist and hermeneutic one, which takes into consideration the external conditions of learning, significant interactions, experiences, and stimuli for learning. This approach allows us to intervene in the area of potential development of pupils with disabilities through a systematic, intentional, and targeted intervention.

However, according to Canevaro (2002), the implementation of these measures led to an unplanned process of dismantling special schools and including disabled pupils in mainstream schools, which the official bodies were not able to follow. This situation has created regulatory uncertainty which has given rise to different behaviors in the field of school integration.

In the 1970s important transformations occurred both from a legislative and linguistic point of view. We have moved from the logic of insertion to the logic of integration. The desired cultural change began in 1974, even if the official date is October 1975, with the introduction of delegated decrees nos. 416, 419 and 417. These decrees introduced the concept of scholastic integration of pupils with disabilities in mainstream schools.

The enabling law n. 382 of 1975 entrusted local authorities with new health and welfare responsibilities, including medical-psychological assistance and assistance to the mentally handicapped. A model of Italian integration was proposed which highlighted the difference between handicap and deficit. It was underlined that handicap is the consequence of the impact on the environment, while a deficit indicates loss or alteration of structures and functions. It has been highlighted that handicap is relative and depends on cultural, social, economic, psychological factors, etc.

Thanks to these new perspectives, greater value has been given to the potential of disabled students and the barriers that hindered their achievement of objectives have been broken down. The need emerged for an educational program that defined the teaching-learning itineraries, a personal file that recorded the student's path, and a quarterly evaluation to review didactic and organizational choices. This new way of teaching was based on the intentionality of the intervention, on the planning of actions, on the prediction of goals and routes, and the organization of learning environments.

The importance of the relationship between school and family was also underlined, as well as the connection between the various services operating in the area. The disabled person was valorized as the protagonist of the educational and didactic intervention. We tried to break down physical, social, and psychological barriers to help achieve the set objectives. It has been highlighted that the attendance of mainstream schools by children with disabilities does not imply the achievement of minimum common cultural goals (Cottini & Rosati, 2008).

Towards the end of 1974, a commission of experts chaired by Senator Franca Falcucci was charged with studying the inclusion of children with disabilities in mainstream schools. Their

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work led to the creation of CM n. 227 of 8 August 1975, an innovative document that underlined the importance of a new approach to Education to welcome every child and promote their personal development.

The famous "Falcucci Document" of 1975, produced by the school administration and politicians, outlined the fundamental principles of school integration. The document stated that the school, being able to adapt educational action to the individual potential of each student, was the most appropriate structure to overcome the marginalization of children with disabilities. However, the need for an organization of health and social services to achieve the same objective was also recognized (Falcucci Document, 1975).

The Falcucci Document of 1975 represented a turning point in the conception and implementation of school integration in Italy, emphasizing the importance of an inclusive school and the organization of health and social services to support students with disabilities.

The Falcucci Report highlighted the shortcomings of Law 118 and initiated a reflection on the scholastic integration of disabled pupils. According to the document, the inclusion of disabled pupils required a new educational approach and teacher training. Specialization courses have been established for school staff. The Falcucci Report established several pedagogical principles, such as the protagonism of disabled students, the importance of enhancing their potential, and the need for common objectives between institutions. The document is considered the "Magna Carta" of educational integration of disabled people and has inspired subsequent laws. However, criticism has been raised regarding the document's outdated language and the failure to abolish special schools (Nocera, 2001).

Law 517 of 1977 represents a turning point for the inclusion of disabled students in mainstream schools in Italy. This law made the presence of disabled students in mainstream schools compulsory, abolishing differential classes and special schools. He also introduced support teachers and the use of a medical team to support the school. The law promoted integrative activities and individualized interventions to meet students' needs. It has also reduced the selective power of teachers and enhanced diversity as an educational resource (Comassi, 1984). The law has encouraged a new teaching culture that puts students' needs at the center and takes into account their individual differences. It promoted the experimentation of flexible teaching and organizational models and set numerical limits for classes that welcome disabled students. Furthermore, it extended compulsory schooling to all disabled students between the ages of six and fourteen. Evaluation has taken on a new role, not only as a selection tool but as an integral part of the process of building knowledge and personal identity.

According to Nocera (Nocera, 1987), law 517/77 represented an element of contradiction that is still emblematic today. On the one hand, it introduced important innovations into the

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Italian school system, accelerating the process of scholastic and social integration of disabled people. On the other hand, it created barriers, as it subjected the school to the control of the health world, negatively influencing school integration.

Despite its limitations, the process of implementing Law 517 is still underway. Many cultural resistances and psychological barriers towards diversity persist, even within the school system itself. However, the law has contributed to making special pedagogy increasingly closer to general pedagogy, stimulating reflection and pedagogical research.

After the entry into force of Law 517, Italy played a pioneering role in the educational integration of disabled people. Numerous laws and ministerial circulars have been introduced to interpret and apply law 517/77. These measures sought to fill the gaps and make the integration process effective.

The 1980s ended with a ruling from the Constitutional Court, n. 215 of 1987, which definitively opened the doors of secondary school to students with disabilities. This ruling, defined as the "Magna Carta" of school integration, guaranteed the full and unconditional right of all pupils with disabilities to attend schools of all levels (MIUR, 2009).

Despite the challenges and barriers still present, law 517/77 has had a significant impact on the educational integration of disabled people in Italy, paving the way for greater inclusion and the valorization of diversity as an educational resource.

The 1987 ruling led to the issuing of ministerial circular 262/88, which made it possible for all students with disabilities, whether physical, mental, or sensorial, to enroll and attend upper secondary school without limitations of gravity. This regulatory and legislative fervor has been supported by reflection and specialist pedagogical-didactic research which has had academic recognition since the 1980s. This has allowed us to have fundamental reference points for integration and inclusion processes, based on different principles. These principles include positive consideration of the disabled person and trust in his or her self-realization abilities, the awareness that the understanding of limits and resources can be understood by considering each person within significant contexts and relationships, the recognition of personal identity in evolution and specificity of each one, a personal relationship based on an affective atmosphere and the activation of evolutionary processes, the possession of scientific and cultural knowledge to create new educational and intervention paths, integration and inclusion as a guiding idea, the consideration of the needs and potential of the disabled person, the evaluation of the anxieties and resources of the family, the consideration of school staff and social workers, the valorization of scientific knowledge and the contribution of the humanistic disciplines and helping relationships (Gatto, 2008).

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Integration: from Framework Law 104/92 to Law 170/2010

The reflections on integration initiated by the laws of the seventies and eighties led to a reevaluation of the school system, teachers, and students. Pupils with deficits are no longer considered abnormal or handicapped, but subjects who, despite encountering difficulties, are considered according to the principle of equality. The Law of 5 February 1992, n.104 expanded the principle of social and scholastic integration, committing the State to remove the disabling conditions that prevent the development of people with disabilities. To achieve all this, tools have been adopted such as the coordinated planning of school services, the provision of technical equipment and teaching aids, the assignment of specialized teaching staff, and specialized operators and assistants. School integration is based on respect and valorization of the diversity of the person, involving institutions, families, and local resources. The law also provides for the evaluation of students based on their potential and initial learning levels.

Law 104, completing the provisions of the art. 117 of the Constitution, outlined the methods of school integration for people with disabilities. The articles of the law deal with various aspects, including the right to education and instruction for every school level and level, the coordinated planning of the Individualized Educational Plan, the training of teachers for support activities, the work on school integration, the principles for the assessment of pupils with disabilities and the repeal of the royal decrees which promoted the separation of pupils with disabilities. Law 104 provides a detailed framework for the integration process of people with disabilities, defining the procedure for recognizing the disability, assigning a support teacher, and using compensatory tools for learning. Implementation decrees have also been issued that specify the integration tools, such as program agreements between educational institutions, local administrations, and health companies, and the tasks of local health units for identifying disabilities. However, the law has some limitations, such as the dominant role of doctors and psychologists and outdated language that frames disability as a personal problem (Nocera, 2007).

Italian legislation has introduced several amendments to improve the recognition and inclusion of pupils with special educational needs. These amendments include:

- The Legislative Decree n. 297/1994, which recognizes pupils with disabilities and those in difficult situations as "pupils in particular conditions".
- Ministerial Ordinance n. 80/1995, which establishes the legal value of the qualification as long as it corresponds to the educational objectives of the ministerial programs.
- Presidential Decree n. 503/1996, which requires the elimination of architectural barriers in school buildings.
- The Ministerial Decree n. 331/1998, which regulates the assignment of places for pupils with disabilities and the testing of effective integration models.

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- Presidential Decree n. 323/1998, which defines the situations of disability and hardship for the final exams of secondary school.
- The Ministerial Decree n. 141/1999, which establishes the number of students per class in the presence of students with disabilities.
- Presidential Decree n. 275/1999, which promotes the autonomy of schools in adopting integration policies.
- Law 62/2000, which guarantees the right to the integration of pupils with disabilities in private schools.
- Law no. 328/2000, which promotes the social, family, and scholastic integration of people with disabilities.
- The Ministerial Decree of 14 July 2000, which integrates the Observatory with a technical-scientific Committee and a Council of Associations of people with disabilities and their families.
- Law 289/2002, which defines the criteria for identifying pupils with disabilities.
- Law no. 53 of 2003, which establishes scholastic integration as an essential characteristic of education.
- Prime Ministerial Decree no. 185 of 23 February 2006, which regulates certification for school placement.
- Law n. 18/2009, which ratifies the UN Convention on the Rights of Persons with Disabilities and provides guidelines for the educational integration of pupils with disabilities.

These amendments (MIUR, 2009) promote the individualization of teaching interventions and include remedial courses, orientation, teaching continuity, and flexibility of timetables. School autonomy offers the opportunity for greater individualization of teaching and learning processes. Didactic personalization is considered a transition phase from the logic of integration to the logic of inclusion, since the differences present in the school concern not only students with disabilities but also the personal and cultural diversity of each student. An inclusive pedagogical and organizational culture is needed to meet the needs of all students.

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From integration to inclusion

Law 170/2010 represents an important guidance tool for policies and initiatives aimed at guaranteeing the right to education and equal educational opportunities for pupils with specific learning disabilities (DSA). The law recognizes dyslexia, dysgraphia, dysorthography, and dyscalculia as specific learning disorders and provides provisions on diagnosis, training, and educational and teaching support measures (Stella & Savelli, 2011).

The purposes of Law 170/2010 are divided into four areas: civil, social, educational, and didactic. The objective is to guarantee the right to education and ensure opportunities for the development of social and professional skills, prepare teachers and raise awareness among parents regarding DSA, promote academic success and promote the development of students' potential, adopt adequate forms of evaluation and encourage early diagnosis and educational rehabilitation courses.

Law 170/2010 promoted a significant cultural change, allowing for early recognition of the learning problems of individuals with DSA and offering them better educational opportunities. However, it is important to underline that the law alone cannot solve all the difficulties related to the management of DSA. Constant commitment is required from the education system and all those involved to implement effective intervention plans.

Following Law 170/2010, the Guidelines of 12 July 2011 were issued, which provide indications on the educational inclusion of pupils with DSA. These guidelines complete the Italian framework on school inclusion, also including pupils with learning difficulties due to personal, family, and socio-environmental disadvantages (Stella & Savelli, 2011).

Furthermore, the Ministerial Directive of 27 December 2012 provides further organizational indications on scholastic inclusion, in particular for those pupils who cannot be certified with either a disability or DSA, but who have learning difficulties. This directive underlines the importance of taking global care of all pupils and the use of specific tools for identifying special educational needs.

Italian schools are taking significant steps towards an inclusive school, thanks to Law 170/2010 and subsequent ministerial directives. However, constant commitment and collaboration between school, family, and health services is necessary to ensure the effective inclusion of pupils with special educational needs.

Across the school landscape, there is increasing recognition of the complexity of classrooms and the importance of providing special attention to students with special educational needs (SEN). The 2012 Ministerial Directive defines the area of scholastic disadvantages broadly, including not only deficits, but also social and cultural disadvantage, specific learning and/or developmental disorders, and difficulties deriving from lack of knowledge of the culture. and the Italian language as they come from different cultures (MIUR, 2012).

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The Directive provides for the possibility of personalizing teaching for students with BES through the adoption of compensatory and dispensatory measures and the creation of a Personalized Teaching Plan. This plan serves to define, monitor, and document the most suitable intervention strategies for teachers and to communicate the planned intervention strategies to families (Ianes & Cramerotti, 2013).

Taking charge of SEN concerns the entire educational community and requires an expansion of the skills of teachers and school managers. The Territorial Support Centers play a fundamental role in interfacing between the administration and schools to support the integration and professional development of teachers.

In 2013, a circular was issued that integrates the 2012 Ministerial Directive, providing schools with operational tools for the educational inclusion of students with BES. The circular dedicates ample space to non-certified SEN, socioeconomic, linguistic, and cultural disadvantages, and allows the activation of individualized and personalized paths for students who need them.

The circular recognizes that in the absence of medical diagnoses, schools can refer to objective situations or reports from teachers or social services to identify students with SEN. Furthermore, it underlines the importance of evaluating school inclusiveness and proposes the use of structured tools such as the Index for Inclusion and the approach based on the WHO ICF model.

The objective of these documents is to guarantee full and effective access to learning for all students with difficulties and disadvantages, personalizing teaching and promoting each individual's potential. Furthermore, they emphasize inclusion as the guiding principle of the school, rather than selection.

The Ministry of Education, University and Research (MIUR) clarifies that only when the class councils or teaching teams unanimously agree on the effectiveness of further tools, in the presence of requests from parents accompanied by diagnoses which however have not given the right to disability certification or in the case of unspecified difficulties, a personalized plan may be adopted with any compensatory and/or dispensatory measures, and a Personalized Educational Plan (PDP) may then be compiled. The school does not have the task of certifying pupils with special educational needs, but of identifying those for whom the adoption of particular teaching strategies is appropriate and necessary.

Teachers are granted maximum autonomy of judgment when faced with diagnoses that do not carry certifications of disability and Specific Learning Disorders (DSA). The note recognizes the professionalism of teachers in the responsible choice of intervention tools and in the possibility of identifying specific cases of intervention in which to implement personalization paths.

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The MIM reiterates that even in the presence of requests from parents accompanied by diagnoses which however do not give the right to certification of disability or DSA, the Class Council is autonomous in the decision to formulate or not to formulate a Personalized Educational Plan, taking care to verbalize the reasons for the decision.

For students with non-Italian citizenship, clarifications are provided that highlight their right to not be discriminated against and their need to receive educational interventions relating to the language, and only exceptionally through a Personalized Educational Plan.

The note also provides information on the organizational methods of the school, such as the definition of the times and methods of meetings during the working group meetings at the beginning of the year, to be able to establish any need for intervention with a view to inclusion. The note also includes information regarding the reorganization of the Territorial Support Centers (CTS) and the Territorial Centers for Inclusion (CTI) in order to redefine the tasks, roles, and relationships between the different bodies to encourage the integration of students with disabilities. (MIUR, 2013).

Law 107 of 13 July 2015, which concerns the reform of the national education and training system, reiterates the principle of promoting the educational inclusion of students with special educational needs through individualized and personalized paths. The law also provides for the strengthening of scholastic inclusion and the right of pupils with disabilities to study, the review of the criteria for inclusion in teaching support roles, the identification of the essential levels of scholastic, health, and social performance, and the review of the methods and criteria relating to certification.

Law no. 134 of 18 August 2015 provides for people with autism spectrum disorders and those who deal with them forms of protection and inclusion through personalized educational and training courses (Santagati & Elia, 2016).

Teachers' training

Today's school is an interesting mosaic where diversity meets and together, we learn to look to the future. Teachers, in particular, must respond to multiple challenges and an increasingly complex knowledge system. For this reason, the teaching profession requires a solid structure, focused technical skills, and agility to adapt to constant change in society.

The teacher profile is complex and requires skills that go beyond disciplinary knowledge, such as teaching methodology, pedagogy, relationships with students, and the use of educational technologies. The formation of such a profile requires a complex initial curriculum that continues during service.

The vision of professional training based on lifelong learning is emerging, recognizing that daily experience constantly enriches knowledge and skills. This allows us to address structural changes and guarantee citizens the full right to social, cultural, and professional participation. This has led trainers to look at different targets, offering everyone access to knowledge and the job market.

European policies and documents on training and education have emphasized lifelong learning as key to national programs and training plans in individual countries. Education and training play a role of primary importance in European policies, which aim for a knowledge-based economy (Mariani, 2014).

The improvement of European education systems can only be achieved through active staff training. The quality of teaching is considered a key factor in improving systems and promoting the inclusion of all students. Inclusive teaching requires professional teaching capable of understanding the complexity of each student and their needs, considering them as bearers of active resources. Adequate training paths are needed to address the heterogeneity of classes and schools.

Teacher training is therefore crucial to promoting inclusion and ensuring success. Teachers must be instruments of school improvement and professionals who make key decisions for the system. They must have the necessary skills to accommodate student diversity. During initial training and refresher training, teachers must be encouraged to acquire the skills, knowledge, and skills that will make them confident in addressing the diverse needs of students.

A teacher-professional is a person who possesses specific and specialized skills, based on recognized scientific knowledge from university or educational practices. The professional always deals with single, unique, and non-repeatable cases. His theorization is based on a single case theory, without assuming a general character (Altet, 2003, p. 33; Calvani, 2012).

The European Agency for Development in Special Needs Education has highlighted the need to train teachers' skills in disseminating inclusive practices in all European countries. To achieve this profound cultural change, training is needed that supports teachers on two fronts: the redesign of educational contexts and the understanding of the variables of school architecture and didactic mediation; becoming aware of one's own way of thinking about inclusion and translating it into practice, addressing one's beliefs and overcoming the obstacles that prevent the management of a classroom as an inclusive environment.

The professional profile of the support teacher

The support teacher is a professional figure introduced into the Italian school system in 1977, to promote the integration of pupils with disabilities and guarantee their right to study and full personality development. The preparation of teachers, which at the time was mainly focused on knowledge of disciplinary contents, was not sufficient to guarantee the rights of pupils with disabilities, so two-year specialization courses were established to provide specific preparation.

In 1977, the programs of the first two-year specialization courses for specialized teachers were approved, which included skills such as motivation analysis, human relations, multi-professional initiative, frustration tolerance, and permanent training in the field.

Integration and support for pupils with disabilities have become a widespread reality throughout Italy, but have led to difficulties in defining the tasks of support teachers. It was underlined that these tasks must not be interpreted in a reductive way or subordinated to class teachers, but specialized staff must be fully involved in educational planning and participate in the verification of school activities.

The characteristics of support teachers, which emerged from successful integration experiences, include the ability to involve the entire school in the integration process, the identification of the specific educational needs of each pupil with disabilities, the ability to respond to these needs with personalized interventions and knowledge of the subject's situation and the school context, allowing the timing and methods of intervention to be adapted based on the nature and extent of the disability.

The commission established in 1984 defined in a broad and detailed way the aspects characterizing the figure of the support teacher, which includes multi-purpose preparation, accurate training, specific pedagogical competence, and knowledge of strategies to satisfy curricular and educational needs. The support teacher is characterized by professionalism, knowledge, skills, and constant updating (La Sala, 2009).

Methodological and didactic innovations, school autonomy, and university training for all teachers have required a redefinition of the profile and duties of the support teacher. It was underlined that the scholastic integration of pupils with disabilities must involve the entire

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school system and the specialized teacher is considered an essential resource, but cannot be the only answer. It is important that all school staff are able to implement strategies and techniques to promote effective integration.

It is stated that the function of the support teacher must not be separated from that of colleagues, but must be a support to highlight the methodological and didactic difficulties in the education and instruction of pupils with disabilities. Difficulties cannot be delegated, but support teachers must be considered a resource for collaboration in the planning and implementation of the school project.

The support teacher does not have to be an expert in teaching or a specific discipline but must possess the ability to identify and substantiate problems, improve their teaching role, and develop relational skills.

In 1999, the Berlinguer Document outlined the tasks of the support teacher in a school in transformation, which remain relevant. These tasks include providing real support to the class in the adoption of integrated pedagogical, methodological, and didactic strategies and techniques, advising the class and colleagues in the adoption of individualizing methodologies, and in the construction of a personalized educational plan for pupils with disabilities.

The support teacher has the task of conducting specialized interventions based on the characteristics and resources of the student with disabilities. These interventions are based on particular methodologies that are not the responsibility of the curricular teacher (Di Nuovo, 2004).

Training of the support teacher

Law 517 establishes the integration of pupils with disabilities into state schools, as well as specialized teachers who had previously worked in separate institutions. These teachers had attended training courses at specialized schools for the blind, deaf, and dumb or for children with special educational needs. However, with Presidential Decree no. 970/75, a "multipurpose" specialization qualification was introduced, obtained through a two-year theoretical-practical course at schools or institutes recognized by the Ministry of Education.

Subsequently, law 517 of 1977 sanctioned the integration of pupils with disabilities in mainstream schools, promoting the closure of special schools. In 1986 the programs of the two-year specialization courses were renewed, giving greater emphasis to the pedagogical-didactic disciplines. In 1992, Framework Law No. 104 reiterated the right to education and training of people with disabilities, entrusting university specialization schools with the task of training support teachers.

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However, Universities were not yet ready to fully assume this responsibility, so the two-year courses were continued by accredited state bodies and specialized institutes affiliated with the Universities. In 1995, new training programs were introduced that distinguish between initial training and in-service training. In 1996, with OM 72/96, the courses were once again entrusted to recognized state and non-state bodies.

In summary, Italian legislation has promoted the integration of pupils with disabilities in mainstream schools and established the training of specialized teachers to support this inclusion.

In the two-year period 1997-1999, the recognition of new specialization courses for support teachers was suspended and the so-called "intensive courses" provided for by law 662/96 linked to the 1997 Budget were activated. These courses had a maximum duration of one year and envisaged a number of hours reduced to 450, with programs scaled-down compared to previous courses.

The specialization qualification awarded was considered monovalent and included participation in further refresher initiatives on the integration of pupils with sensory disabilities. At the end of the 1990s, the MURST, Ministry of University and Scientific and Technological Research, issued a decree which established the criteria for the regulation of degree courses in Primary Education Sciences and specialization schools for teaching in Secondary School. This decree also provided for additional teaching activities of at least 400 hours regarding the scholastic integration of pupils with disabilities, which constituted a requirement for carrying out the support activity.

As regards elementary school, the preparation of support teachers was guaranteed through degree courses in Primary Education Sciences. For secondary school, the specialization courses included an additional semester after the two-year training period.

In the interministerial decree of November 1998, it was established that as long as there was no teaching staff with a specialization title for the support obtained through a degree or specialization school, Universities could establish two-year specialization courses for the support of classes with disabled students. Furthermore, the Education Superintendents were allowed to establish specialization courses to support teachers already in service.

However, a problem emerged because the activation of similar courses for qualified nursery and primary school teachers was initially excluded. Only subsequently, with article 1 bis of Law no. 4 June 2004. 143, special qualification courses have been provided to support these teachers. (Canevaro & Vercillo, 2016).

Inclusion and technology

Parallel to the integration and inclusion of students with difficulties in Italian schools, there has been a widespread need to use technologically advanced tools within teaching.

Initially, information and communication technologies (ICT) received special attention in special education. From the moment these technologies became available for mass use, their ability to replace, overcome, or compensate for the difficulties resulting from the limitations caused by disability was recognized. Even more recently, the use of technologies for students with Specific Learning Disabilities (DSA) has been motivated by the need to compensate for specific difficulties in reading-writing (with the use of speech synthesis or word processing programs) or in calculation (with the use of calculators).

With the advent and spread of digital technologies (ICT) and with the possibility for teachers and students to have simple, powerful, and portable devices, the opportunities for the use of technology in teaching have significantly expanded. Not only can technologies be used for support or compensation purposes in special education, but also because access to information has become practically unlimited in terms of quantity and possibilities of when, where, and who can access it. Easier accessibility to information requires teachers to rethink the use of ICT in their teaching. In particular, they are increasingly called upon to teach:

- How to effectively, efficiently, and consciously use the information that can be acquired from the web.
- How to read and use new languages (different from traditional textbooks, including multimedia) and how to mix them.
- How to process and rework the information acquired to link and connect them to each other to produce new products that constitute the basis of broader personal knowledge.

It is clear that the skills acquired through the use of information are essential for a school whose main task is to prepare new citizens for inclusion in adult society. These skills are not specific or exclusive to students with Special Educational Needs (SEN) such as Specific Learning Disabilities (DVA, DSA, and others), but are fundamental for all students. Therefore, the use of ICT in teaching becomes an inclusive tool (Munafò, 2018).

Territorial organization for school inclusion

In recent years, Italian schools have undergone great changes to ensure a welcoming environment for all students, regardless of their functional differences and specific needs.

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The objective is to guarantee each student an inclusive training and teaching path. To support educational institutions in this task, a territorial support network has been created, which will be subject to further reorganization, to address the problems and manage the available resources.

Teachers can count on a widespread structure that offers itself as a point of reference for Special Educational Needs. This support is divided into different levels: at the individual school level there are the Operational Working Groups (GLO) and the Working Groups for Inclusion (GLI); at the district level, there are the Territorial Centers for Inclusion (CTI); at the provincial level there are the Territorial Support Centers (CTS) and the Provincial Inter-institutional Working Groups (GLIP); finally, at the regional level, there are the Regional Inter-institutional Working Groups (GLIR).

The Regional School Offices act as a link between these bodies, while at a national level, there is the National Coordination of the CTS, established at the MIM (Ministry of Education and Merit).

GLO

The Operational Working Groups meet to address the specific problems of an individual student. These groups are made up of the school director, the class council, the pupil's parents, and the healthcare staff. Their main task is to draw up the Individualized Educational Plan (IEP) and verify its effectiveness in guaranteeing an educational path that favors the development of the potential of the pupil with disabilities.

Furthermore, the Operational Working Groups can formulate proposals to the Inclusion Working Groups, regarding specific needs that emerge in the Individualized Educational Plan. The objective is to ensure the effective inclusion of the pupil and adequately respond to his needs.

GLI

The Inclusion Working Groups are made up of the school director, curricular and support teachers, parents, and representatives of the school council. They can also take advantage of expert advice. Their functions are defined in CM 8/2013 and include various activities.

Firstly, the Inclusion Working Groups deal with detecting the presence of Special Educational Needs (SEN) within the school. Subsequently, they collect and document the educational interventions implemented to respond to these needs.

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The members of the Working Groups discuss the cases identified and provide mutual advice. Furthermore, they are responsible for detecting and evaluating the level of inclusiveness of the school as a whole.

Another important responsibility of the Working Groups for Inclusion is the collection and coordination of the proposals formulated by the Operational Working Groups (GLO) to address the specific needs of pupils with disabilities.

Finally, the Working Groups for Inclusion developed a proposal for an Annual Plan for Inclusivity (APal), which represents an action plan to promote and improve school inclusion.

CTI

Territorial Centers for Inclusion are structures that can be organized at a territorial network level. They integrate the functions of the Territorial Centers for the scholastic integration of pupils with disabilities, the Documentation Centers for the scholastic integration of pupils with disabilities, and the Territorial Resource Centers for the scholastic integration of pupils with disabilities.

The Territorial Centers for Inclusion are made up of teachers with specific skills, as required by CM 8/2013. These teachers are able to provide concrete support to schools and colleagues through consultancy and targeted training interventions.

The objective of the Territorial Centers for Inclusion is to promote an inclusive school environment, providing resources and support to teachers and schools, in order to guarantee adequate education and integration of pupils with disabilities.

GLIP

The Provincial Institutional Working Groups, provided for by law 104/1992, are established at the Provincial School Office. These groups are made up of several members, including a technical inspector appointed by the director of the USR, a teacher, experts designated by the regional health authority, local authorities, and representatives of sector associations.

The Provincial Institutional Working Groups (GLIP) offer advice and proposals for integration to the regional school director and local schools. Furthermore, they collaborate with local authorities and local health authorities for the implementation of Individualized Education Plans (PEI) and for any other activity related to integration.

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The GLIP annually presents an integration program to the Director of the Provincial Education Office. The main objective of these groups is to promote and facilitate the integration of students with disabilities within the provincial school system.

GLIR

The Regional Interinstitutional Working Groups are foreseen by the Guidelines for the educational integration of pupils with disabilities of 4 August 2009. Their main objective is to activate initiatives for regional program agreements, in order to coordinate and optimize the use of resources for the scholastic integration of pupils with disabilities.

These groups also have the task of promoting unitary regional initiatives and acting as a link with regional socio-health choices. They are made up of representatives of the school administration, the Region, local authorities, trade associations, and sector experts.

Through the collaboration of various entities, the Regional Interinstitutional Working Groups work to ensure effective educational integration of pupils with disabilities, promoting a coordinated and optimized approach at a regional level.

CTS

The Territorial Support Centers (CTS) are established by the Regional School Offices in agreement with the Ministry of Education and Merit (MIM). They are located in hub schools, with at least one center per province. Their main task is to activate collaboration networks between schools and services to encourage the inclusion of pupils with Special Educational Needs (SEN) in the educational path and ensure efficient management of the resources available in the area.

The CTS are made up of various figures, including the headmaster, at least three curricular and support teachers, a representative of the Regional School Office (USR), a health worker, and teachers specialized in the field of school inclusion.

The main task of the CTS is to create and maintain a permanent territorial network that encourages the sharing of knowledge, good practices, and technological resources (hardware and software) to support the educational integration of students with SEN through the use of New Technologies.

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Furthermore, the CTS aim to promote training initiatives on the correct use of technologies aimed at teachers, school workers, parents, and the students themselves. This is to encourage correct and effective integration of technologies in the educational sector. (ADIDA Association, 2019)

The establishment of the CTS

The Territorial Support Centers (CTS) were established by the Regional School Offices in collaboration with the Ministry of Education in 2006, through the "New technologies and disabilities" project. There are currently 107 throughout Italy, of which four are in Liguria.

The CTS play an interface role between the school administration and the schools, as well as between the different schools themselves. Their main function is to provide support to the school integration process, the professional progress of teachers, and the dissemination of good practices.

The CTS inform teachers, pupils, students, and their parents about the technological resources available, both free and commercial. They organize training initiatives on school inclusion, Special Educational Needs (SEN), and technologies for integration. They also evaluate and suggest free software solutions to their users.

The Centers offer consultancy both to identify the most appropriate aids for students and for teaching methods and collaboration with families. They also acquire aids suited to the needs of the area and collect the best inclusion practices.

To optimize service provision, the CTS collaborate with the Territorial Inclusion Groups (GIT) to support local schools in inclusion processes (Education, Metropolitan City of Genoa).

Furthermore, the Territorial Support Centers (CTS) are also centers of educational research and experimentation activities, which can be carried out through collaboration with other schools, Research Centers, Universities, and local health and social services. The CTS can promote territorial agreements and understandings with social and health services in order to develop shared procedures for the integration of services, the shared use of resources, and the launch of projects. In each CTS there should be three operators, including curricular and support teachers, who participate in training sessions during local and national events. Furthermore, the CTS can establish a Scientific Technical Committee with the task of defining the general guidelines for intervention activities. Regional representatives are also expected to coordinate and advise on the activities. Finally, the National Coordination of CTS was established at the MIM, which coordinates the activities of these centers in the national context (Disabili.com).

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The process of identifying and distributing aids follows a specific path made up of four steps:

1. Identification of needs:
 - School institutions, based on the needs identified in the Individualized Educational Plan (PEI), present projects for the acquisition and adaptation of teaching aids.
2. Evaluation and approval:
 - The projects are evaluated by special commissions established by the Regional School Offices, which draw up rankings.
3. Implementation:
 - The CTS plan the interventions associated with the selected projects and proceed with the necessary purchases, also through agreements with specialized centers.
4. Deployment and Support:
 - The aids are loaned for use to schools and accompanied by training activities to encourage their correct use.

The process therefore follows a well-defined process, from the reporting of needs by schools to the evaluation and selection of projects, up to the implementation and distribution of aids, supported by training activities for school staff.

Tools and software for inclusion

The CTS offer multiple tools and software according to the needs a student has.

To get a specific tool or software each school has to produce a project describing the needs of the child and the way the tool/software required would be used and integrated in the learning process.

Following, are some of the tools/software that are possible to get through CTS.

Hardware

- Mouse adapters
- Alphatalker II: This is an easy lightweight communicator that can be personalized specifically to the user. It is durable and is helpful to students who have poor gross motor skills. A key can now be put in the overlay to use on a computer or environmental control commands.
- Big Mack: Big Mack is a basic symbolic communicator that plays a pre-recorded voice message, allowing the person to make a request, participate in an activity, or make a choice.

- Big step by step: Big Step By Step is a single-message communicator with sequence, recordable on 3 levels.
- Wheelchair arms.
- Intellykeys: The Intellykeys keyboard is made of a programmable membrane that provides easier access to the computer on the motor, visual, and cognitive levels.
- Joystick plus: It is a large joystick characterized by extreme precision and reliability. It is equipped with the left click, right click, double click, locked dragging, and speed regulator functions. The function keys are recessed in such a way as to facilitate those who have problems with fine hand control. There are two sensor inputs in order to emulate the left click and the right click of the mouse if necessary.
- Little step by step: Little step by step with levels is a communicator on which you can record a series of messages. By pressing the activation surface (with a diameter of 6.3 cm), the messages are activated in sequence. It supports the use of an external sensor (for a different activation), not included in the delivery.

Software

- Paperella (Helpicare): PAPERELLA is a Preschool software for Windows designed for very young children or for people with severe/very severe deficits. It is a program designed to discover and learn to become familiar with the cause-effect relationship; it also allows you to perform simple prediction and figure-sound association activities.
- Scan and paint (Auxilia): Scan and Paint is a program that develops the child's creativity by coloring figures.
- Clicker (Crick software): Clicker is the complete writing solution for the primary classroom, providing every pupil with just the right level of support and challenge.
- SymWriter (Auxilia): SymWriter is an innovative and powerful program that allows you to write texts by obtaining the immediate coupling of symbols to words and creating environments for a variety of teaching exercises.
- Boardmaker: Through a modern and updated interface, Boardmaker allows you to quickly build and print communication tables, teaching and educational materials, timetables, visual agendas, diagrams, and graphs to be used in paper form. Using the commands that the software makes available, communication tables and educational materials can become dynamic tools that the child can use on a tablet or PC.
- LeggiXMe_FW40 and LeggiXMe_Junior: Suite of apps with a program to facilitate reading and writing through speech synthesis for ages 10 and up, a talking calculator, and map creation.
- LeggiXMe_BIG: A suite of apps with a program to facilitate reading and writing through speech synthesis for visual impairment.
- LeggiXMe_SAPI 5: A suite of apps with a program to facilitate reading and writing through speech synthesis using purchased voice synthesizers.
- AraWord: Augmentative and Alternative Communication (AAC) software/website.

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- SimCAA: AAC account with ArasAAC pictograms.
- ABC: ABC is a small series of tools designed to facilitate the acquisition of reading and writing skills.
- PoTS: The Parts of The Speech: Software for acquiring English vocabulary and verbs using sounds and images.

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3.3. National Educational System – FINLAND

(<https://okm.fi/koulutusjarjestelma>)

In Finland, early childhood education supports a child's development, learning, and well-being. It is systematic and goal-oriented. It consists of upbringing, teaching, and care, forming a planned and purposeful entity. The goal of early childhood education is to promote development and health. Its aims include supporting well-being and fostering the prerequisites for a child's learning.

Municipalities are obligated to provide early childhood education primarily for children under school age. A client fee is charged for early childhood education based on family size, income, and the time the child spends in early childhood education.

The national early childhood education curriculum guidelines, approved by the Finnish National Agency for Education, guide the planning and implementation of early childhood education content and serve as the basis for local early childhood education plans. Early childhood education employs kindergarten teachers (with a higher education degree) and childminders (with a vocational degree).

Preschool education enhances learning prerequisites. The goal of preschool education is to strengthen children's learning and development prerequisites as part of the continuum of early childhood education and basic education. Preschool education has been mandatory in Finland since 2015 and is free of charge.

A child's guardian is responsible for ensuring that the child participates in preschool education or other activities that achieve the goals of preschool education. The national preschool education curriculum guidelines, set by the Finnish National Agency for Education, guide the planning of preschool education content and serve as the basis for local curricula.

Compulsory education begins with basic education and ends at 18 years old. Basic education covers grades 1–9 and is intended for the entire age group (7–17 years old). Compulsory education primarily begins in the year the child turns seven. Every child residing permanently in Finland is subject to compulsory education.

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Basic education is free of charge. Municipalities and other educational providers maintain comprehensive schools. Less than 2 percent of comprehensive school students attend private or state schools.

After completing comprehensive school, young people must apply for further education. Compulsory education ends when a young person turns 18 or when they complete a secondary-level qualification (either the matriculation examination or a vocational qualification).

Preparatory education for qualification-based education is intended for compulsory education-age individuals and others without a secondary-level qualification who need preparatory education. The goal is to provide students with the readiness to study in qualification-based education.

Statistics about Special Education from year 2022

(<https://stat.fi/julkaisu/cl8lmq0ndqquf0dutte806lj3>)

In Finland, the Statistics Finland agency operates. It produces reliable and unbiased official statistics on Finnish society and leads and develops national statistical activities. Statistics Finland compiles statistics on special education in Finland annually, retrospectively. The statistics for the year 2022 are already available, while the statistics for 2023 will be finalized on August 16, 2024.

According to Statistics Finland, an increasing number of comprehensive school students in Finland received learning support in 2022. Intensified support was received by 79,200 students, or 13.9%, while 55,500 students, or 9.7%, received special support. The percentage of students receiving intensified or special support increased by 0.7 percentage points from the previous year. In total, 24% of comprehensive school students received intensified or special support in 2022.

In 2022:

- Among students receiving intensified support, 61% were boys and 39% were girls. Of students receiving special support, 69% were boys and 31% were girls. In 2022, among comprehensive school students, 51% were boys and 49% were girls.
- In grades 1-6, 34% of students receiving special support had their education entirely in special groups or classes, while for grades 7-9, this figure was 29% in 2022.
- The combined numbers of students receiving intensified and special support varied from 20% to 31% across different regions (maakunnat).
- In early childhood education, 11% of students received intensified or special support, with 72% of them being boys and 28% girls.
- In vocational education leading to qualifications, 39,100 students received special support in 2022, with females outnumbering males as recipients for the first time. Among them, 72% were boys, and 28% were girls.

In Finland, there are separate special schools as well as regular schools where special groups and classes are integrated. In the fall of 2022, 5.7% of students receiving special support received their education entirely in a special school's special group or class. The proportion of students receiving education entirely in a special school's special group or class has decreased annually; in 2022, it was 7.6 percentage points lower than in 2011. In 2022, the

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proportion of students receiving their education entirely in a non-special school's special group or class was 26%.

Among students receiving special support, 32% received their education entirely in a non-special school's special group or class, and 36% of students had 80-100% of their education in a general education group. For the remaining 32%, education was more evenly split between general education groups and special groups or classes. Thus, almost one-third of students receiving special support had their education entirely in a special class or group, either in a special school or a non-special school.

Since the fall of 2020, the information on "education entirely in a general education group" has been replaced with the category "education from 80-100% in a general education group," which, according to the definition of inclusion, includes 80% or more in a general education group.

In the fall of 2022, 22% of students receiving special support had extended compulsory education. This percentage is 1.1 percentage points lower than the previous year. Among those with extended compulsory education, 68% were boys and 32% were girls.

Support services such as tutoring, assistant services, interpreting services, and part-time special education included in special support decreased. Among students receiving intensified support in the fall of 2022, 80% had part-time special education, 54% had tutoring, 33% had assistant services, 2% had interpreting services, and 6% had special aids.

Among students receiving special support, 45% had part-time special education, 38% had tutoring, 55% had assistant services, 5% had interpreting services, and 11% had special aids.

Part-time special education increased compared to the previous year only as intensified support. Tutoring, assistant services, and interpreting services decreased in both support types. The proportion of special aids remained unchanged.

During the academic year 2021–2022, a total of 132,000 students received part-time special education, which was 23.5% of fall 2021's elementary school students. This proportion is 0.8 percentage points higher than the previous academic year.

In the fall of 2021, part-time special education was included in intensified support for 60,100 students, and special support for 25,100 students. Based on the decrease, it can be inferred that out of the 132,000 students receiving part-time special education during the 2021–2022 academic year, approximately 46,850, or 35% received part-time special education as general support.

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According to available statistics, at least 31.3% of fall 2021 elementary school students received some form of support during the 2021–2022 academic year. This percentage is 1.0 percentage point higher than the previous year.

A total of 175,700 students received intensified support, special support, or part-time special education as general support during the 2021–2022 academic year. In addition to part-time special education, general support may have been provided in other ways, but these other forms of general support are not included in Statistics Finland's Learning Support statistics.

The proportion of students receiving intensified support was highest in North Karelia at 16.5% and lowest in Kainuu at 11.8%. The amount of support varies across different regions.

The proportion of students receiving special support was lowest in mainland Finland's Central Ostrobothnia at 6.7% and highest in Kymenlaakso at 14.4%. In Åland, the proportion of students receiving special support was 5.8%.

Among mainland Finland's regions, the highest combined proportion of students receiving intensified and special support was in Kymenlaakso, where 31% of elementary school students received intensified or special support. The lowest combined proportions were in Lapland and Northern Ostrobothnia, both at 20%.

In 2022, Statistics Finland collected more detailed information on learning support in early childhood education for the first time. Students in early childhood education associated with schools are included in the figures for elementary school students. Four new database tables have been published regarding learning support in early childhood education. Among students in early childhood education, 16% are in school-associated settings, while 84% receive education in early childhood education settings.

In early childhood education settings, 15% of boys and 6% of girls received intensified or special support. Among them, 7% received intensified support, with 10% being boys and 4% girls. Special

support was received by 4% of students, including 5% of boys and 2% of girls. Overall, 72% of students receiving intensified or special support were boys, and 28% were girls. In 2022, boys made up 51% of all students in early childhood education settings, while girls made up 49%.

Among students receiving special support in early childhood education, 30% received education entirely in a special needs group or class, and 35% had 1-19% of their education in regular education settings. 15% of students had 80-100% of their education in regular education settings.

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The main forms of support in early childhood education were part-time special education and assistant services. Among students receiving intensified support, 60% had part-time special education, and 34% had assistant services. Among students receiving special support, 64% had part-time special education, and 49% had assistant services.

In 2022, 39,100 students in vocational education received special support, which is 11% of the total number of vocational education students. The majority, 86%, studied in vocational institutions, while 12% studied in special vocational institutions.

In vocational education leading to a basic vocational qualification, a total of 38,700 students received special support, accounting for 15% of all students in basic vocational education. In professional qualification training, 0.6% of students received special support, and in specialist vocational training, 0.1% received special support.

In 2022, 49.8% of special support recipients were male, and 50.2% were female. Among vocational education students, 48.0% were male, and 52.0% were female. Overall, 12% of male students and 11% of female students received special support.

Support growth and Learning

(<https://www.tyrnava.fi/koulutus-ja-kasvatus/perusopetus/kasvun-ja-oppimisen-tuki.html>)

In Finland, support for students in education is divided into three levels: general support, intensified support, and special support. The Basic Education Act specifies the forms of support provided for each level. The purpose of the general intensified, or special support given to students is to ensure that they have the opportunity to complete their compulsory education according to their individual abilities and to provide them with good prerequisites for further studies.

Support looks different depending on the needs of the student. Not all students use the same methods. The growth and learning of students are supported in everyday school work, for example, through flexible grouping, differentiated teaching, part-time special education, or small group instruction, as well as the work of school attendance assistants in classrooms.

When a student needs more regular, extensive, or otherwise effective support in their studies, the need for support is assessed multidisciplinary, and if necessary, the student receives intensified support. In this case, an individual learning plan is drawn up for the student in cooperation with parents, teachers, and other rehabilitation entities. Instructions for creating the learning plan are provided in the Basic Education Act and the curriculum.

If a student constantly requires a lot of support in their studies and school attendance, a decision for special support can be made for them. Individual goals may also be defined for them in one or all subjects if necessary. The decision to start special support is made by the Director of Education based on a pedagogical assessment and, if necessary, an expert opinion. When preparing the decision, the parents are consulted. Support for growth, learning, and school attendance is further described in the municipality's own curricula.

Guidelines about Special Education mentioned in Basic Education Curriculum

(<https://www.oph.fi/en/education-and-qualifications/basic-education-curriculum>)

Support forms specified in the Basic Education Act

- Support teaching:

A student who has temporarily fallen behind in their studies or otherwise needs short-term support in learning is entitled to receive support teaching. Support teaching should start as soon as learning or school-related difficulties are identified to prevent the student from falling permanently behind in their studies. Support teaching can also help prevent difficulties in advance. Support teaching should be provided systematically and as often as necessary.

Support teaching is characterized by individually designed tasks, time allocation, and guidance. Support teaching should use versatile methods and materials to find new ways to approach the subject matter. In proactive support teaching, new learning topics are introduced in advance. Support teaching can also address support needs arising from absences. Schoolwork should be planned in a way that allows every student to participate in support teaching if needed. Support teaching can be provided during the student's regular schedule, during lessons related to the need for support, or outside of lessons. Various flexible grouping methods can be used in implementing support teaching. The initiative to provide support teaching to a student is primarily made by the teacher, but the student or guardian can also make the request. It is the responsibility of every teacher to monitor the student's learning and growth, as well as the emergence of the need for support. Support teaching should be organized in collaboration with the student and the guardian. They should be informed about the methods and importance of support teaching for learning and school attendance, as well as the student's obligation to participate in the support teaching. Support teaching can be provided at all three levels of support. As part of pedagogical assessment and evaluation, the adequacy and impact of the support teaching the student has received previously, as well as the student's future needs for support teaching, are assessed. The objectives and provision of support teaching are also included in the learning plan and Individualized Educational Plan (IEP).

- Part-time special education:

If a student has difficulties in learning or school attendance, they are entitled to receive part-time special education alongside regular education. Part-time special education is provided to students who experience such difficulties. These difficulties may include, for example,

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linguistic or mathematical difficulties, learning difficulties in specific subjects, study skills issues, problems with social skills or school attendance.

The aim of part-time special education is to strengthen the student's learning prerequisites and prevent learning and school attendance difficulties. Part-time special education is provided with flexible arrangements. It can be provided through simultaneous teaching (a special education teacher is present in the classroom with the regular teacher and supports the students who need support), small group teaching (support-needed students come to a separate space to study with the special education teacher), or individual teaching (a student needing support comes alone to study in a separate space with the special education teacher). The objectives and contents of part-time special education are linked to the student's overall education. The implementation of part-time special education is planned, and its needs and effects are evaluated in collaboration between teachers and with the student and the guardian. Students and their guardians are informed about the importance of part-time special education for learning and school attendance, as well as the student's obligation to participate in it. Part-time special education is provided at all levels of support. Part-time special education usually becomes more significant as a support form during intensive support. A student can receive part-time special education during intensive support and when studying in a special class. As part of pedagogical assessment and evaluation, the adequacy and impact of the part-time special education the student has received previously, as well as the student's future needs for part-time special education, are assessed. The objectives and provision of part-time special education are also included in the learning plan and IEP.

- Services and aids required for participation in education:

Students have the right to receive interpreting and assistant services, other educational services, and special aids necessary for participating in education at all levels of support. The aim is to ensure the basic prerequisites for learning and school attendance for the student, accessibility, and the opportunity to interact on all school days. When necessary, students are provided with interpreting services, for example, due to a hearing impairment or a language-specific difficulty. They may also need communication aids or alternative communication methods, such as various symbol systems. For students using sign language, the communication support may involve the use of a sign language interpreter or a sign language proficient assistant. In the case of students with various degrees of hearing impairments, the method of interpretation may be something other than sign language interpretation. For students with language-specific difficulties, a speech language interpreter or an assistant proficient in communication aids can be used. Teachers can also support students in communication using signs or other symbols.

The teacher's tasks include planning, teaching, providing support, and assessing the student's and the whole group's learning and work. The assistant guides and supports the

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student in daily situations related to learning and school attendance tasks according to the instructions of the teacher or other support professionals. Teachers and assistants plan and evaluate their work together and, when needed, with other staff members. It is essential to have clear division of work and responsibilities. The support provided by an assistant promotes the student's independent coping and self-sufficiency and helps develop a positive self-esteem. The goal of assistant services is to support an individual student in a way that enables them to take increasing responsibility for their learning and school attendance. The support provided by an assistant can be directed to an individual student or the entire class.

The need for special aids may be related to vision, hearing, movement, or other physical needs. It may also be related to special learning needs. In such cases, various ICT applications, audio books, tools for visualizing mathematics, or aids for concentration may be used. Those working with the student should be sufficiently familiar with the use of aids required for participation in education and should guide the student and the guardian in their use in collaboration with other support professionals. The use of aids should be planned and their use and need should be regularly evaluated. Professionals working with the student plan the use of services and aids required for participation in education in various learning situations, utilizing other experts when necessary. Supporting the student may require special expertise that the school's staff may not have enough of. In such cases, services offered by learning and guidance centers and training and consultation provided to the staff are utilized.

The organizer of education decides on interpreting and assistant services, and other educational services, and special aids. The need and extent of services and aids are assessed through multidisciplinary cooperation, utilizing information provided by the student and the guardian, as well as opinions from external experts, if any. The need for services and special aids for a student receiving intensive support is assessed in the pedagogical assessment. The need for services and special aids for a student receiving special support is assessed in the pedagogical evaluation, and decisions are made in the decision on special support. A general or intensive support student's possible services and special aids are determined through an administrative decision. The use of services and aids is described in the learning plan or IEP.

Locally municipalities can decide a lot of matters. In the local curriculum, decisions are made and described on how support is provided in practice in the following areas as concretely as possible. Key local guidelines related to the practical organization of support for learning and schooling include:

- models for preventive work and early intervention.
- action and cooperation in transitional phases.
- systematic screening of support needs for learning and schooling.
- cooperation, responsibilities, and division of work within the educational sector and with other municipal departments.

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- collaboration with professionals responsible for student welfare services and other necessary experts in assessing support needs, planning support, organizing it, and implementing it in practice.
- key-principles for cooperation with families on issues related to support for learning and schooling.
- authorities related to support for learning and schooling in various administrative decisions.

General support:

- Practical organization of general support.
- Cooperation, responsibilities, and division of work among different stakeholders.
- Cooperation with the student and parent/guardian.

Enhanced/intensified support:

- Practical organization of enhanced support.
- Practices related to making a pedagogical assessment.
- Procedures for starting, implementing, and ending the enhanced support for the student.
- Practices related to creating, evaluating, and revising the learning plan.
- Collaboration, responsibilities, and division of work among different stakeholders in the creation of pedagogical assessment and learning plan, organizing enhanced support, and monitoring and evaluating the effects of support.
- Procedures and collaboration with the student and parents in creating the pedagogical assessment and learning plan, organizing enhanced support, and monitoring and evaluating the effects of support.

Special support:

- Practical organization of special support.
- Practices related to making a pedagogical investigation.
- Procedures related to hearing the student and parents.

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- Deciding on special support.
- Revising the decision on special support.
- Procedures for ending the special support and continuing the support as enhanced support.
- Practices related to creating, evaluating, and revising the Individualized Education Plan (IEP).
- Collaboration, responsibilities, and division of work among different stakeholders in creating the pedagogical investigation and IEP, organizing special support, and monitoring and evaluating the effects of support.
- Procedures for using possible expert opinions.
- Procedures and collaboration with the student and parents in creating the pedagogical investigation and IEP, organizing special support, and monitoring and evaluating the effects of support.
- Practices related to individualizing the curriculum as part of creating the pedagogical investigation, making a decision on special support, and creating the IEP.
- Practices for implementing extended compulsory education, child's transition to extended compulsory education, multidisciplinary collaboration in the process, practical organization of teaching collaboration with pre-primary education and other early childhood education, and other collaboration, responsibilities, and division of work among different stakeholders collaboration with the student and parents combining different subjects into subject areas or dividing them into sub-areas, with a detailed description of goals, content, and methods for each specific area Basic support forms specified in the Basic Education Act.
- Practical organization.
- Collaboration, responsibilities, and division of work among different stakeholders.
- Practices for informing students and parents and collaborating with them Opetussuunnitelmassa specifies administrative practices and decision-making regarding interpreting and assistant services, other educational services, and special aids in a manner determined by the education provider.

Levels and Support Methods

(<https://www.oph.fi/fi/koulutus-ja-tutkinnot/oppimisen-ja-koulunkaynnin-tuki>)

Many children need support in their learning. According to the Basic Education Act, students have the right to receive guidance and sufficient support for learning and school attendance throughout their basic education. Support must be provided as soon as the need arises.

A student may need support in learning and school attendance temporarily or on a long-term basis. The need for support can vary from mild to severe, or a student may need various types of support at the same time. The support provided by the school depends on the nature and extent of the difficulties.

Many factors that cause learning difficulties can be identified even before the start of schooling during early childhood education or preschool. Learning or school attendance difficulties may also arise during basic education. The earlier a student receives support, the better the chances of avoiding the accumulation and worsening of difficulties. It is important to ensure seamless support for the child as they transition from early childhood education to preschool, preschool to basic education, and throughout different stages of schooling.

To detect the need for support early, the student's situation should be monitored and support should be initiated as soon as the need arises. Cooperation with the student and their guardians is important for both identifying needs and planning and implementing successful support. The support provided to the student should be flexible, long-term, and adaptable to the changing needs of the student. Support methods are used both individually and in combination with each other. Support is provided for as long as necessary and at the level required.

There are three levels of support for learning and school attendance: general support, intensified support, and special support. A student can receive only one level of support at a time. Support methods include tutoring, part-time special education, assistant services, and special aids. All support methods can be used at each level of support except for special education based on a decision for special support. In addition to the support for learning and school attendance prescribed in the Basic Education Act, a student may also receive individual student welfare services as provided for in the Act on Student Welfare.

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General Support:

General support is the first way to respond to a student's support needs. This usually involves individual pedagogical solutions and guidance and support measures to influence the situation as early as possible as part of everyday school life. General support is provided as soon as the need arises, and starting support does not require specific assessments or decisions. As the need for support grows, the student should receive intensified support.

Enhanced/Intensified Support:

Intensified support involves more continuous, stronger, and more individualized support for a student's learning and school attendance. The student may need multiple forms of support. The initiation, organization, and, if necessary, return to general support are discussed based on a pedagogical assessment undertaken in cooperation with multidisciplinary collaboration with student welfare professionals. Intensified support is provided according to an individualized learning plan developed for the student. Collaboration and planning are essential for the implementation of intensified support.

Special Support:

If the intensified support provided to a student is not enough to help them cope with schoolwork, a decision on special support based on a pedagogical assessment is made. An individualized education plan (IEP) is developed for the student, detailing the provision of education and other support based on the decision for special support. Special support consists of special education and other support provided to the student in accordance with the Basic Education Act. Special education and other support received by the student constitute a systematic whole. Parental support, multidisciplinary collaboration, and individual guidance are crucial.

More about Special Support

(<https://www.oph.fi/fi/koulutus-ja-tutkinnot/erityinen-tuki>)

Special support consists of special education and other support that the student needs. Special education is primarily pedagogical, support for learning, while other support includes support for schooling. Special education and other support form a systematic and planned whole.

For a student who has been granted special support, teaching is provided according to a Personalized Curriculum Plan (HOJKS) that has been prepared for them. The HOJKS specifies, among other things, special focus areas for studying:

- Monitoring and assessment of the student's progress.
- Opportunities for the student to demonstrate their skills in different ways.
- Assessment methods and timing.
- Student self-assessment.
- Other pedagogical solutions, such as flexible grouping, simultaneous teaching, teaching methods, study strategies, working methods, communication methods, and learning materials.

If a student is studying one or more subjects according to an individualized curriculum, the HOJKS lists these subjects and defines their goals and key content, as well as specifies how progress will be monitored and assessed.

The pedagogical solutions included in special education can vary between different subjects and other learning areas. Some of the pedagogical support may also be short-term, targeted support for a single subject. A student receiving special support also has the right to receive tutoring and part-time special education.

Other support provided to a student receiving special support as defined by law includes interpreting and assistant services, as well as special aids. The other support the student receives is also defined in the HOJKS.

A student's status is that of a student receiving special support once they have been granted special support. They cannot receive general, enhanced, and special support at the same time, but can only be at one support level at a time. The student also cannot have both an individualized curriculum plan required for enhanced support and a HOJKS at the same time.

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Sometimes you might hear the phrase "The student has a HOJKS in a certain subject." However, the HOJKS is prepared for a student to receive special support for all teaching and other support, not just narrowly for a single subject. Special education also does not only consist of teaching those subjects where the curriculum is individualized. The need for support and for individualizing the curriculum usually varies by subject. If the need for support is, for example, socio-emotional, a student receiving special support may not have any individualized curriculums at all.

Decision on Special Support

(<https://www.oph.fi/fi/koulutus-ja-tutkinnot/paatos-erityisesta-tuesta>)

The education provider is responsible for ensuring that the student's right to education in accordance with the curriculum and support for learning and school attendance is realized. Special support consists of special education and other support that the student needs. On this page, you can find information about the decision on special support, hearing of the student and guardian, making and reviewing the decision on special support.

In general, the decision on special support is preceded by the student receiving intensified support. According to the Basic Education Act (Section 17 subsection 3), before making a decision on special support, the education provider must obtain a report from the student's teachers on the progress of the student's learning. In addition, a report must be obtained through multidisciplinary collaboration with student welfare professionals on the intensified support the student has received and the overall situation of the student. Based on these two reports, an assessment of the need for special support is made. If necessary, the pedagogical report must be supplemented with a psychological or medical expert opinion or equivalent social report. The Finnish National Agency for Education has provided model forms for pedagogical reports for pre-primary and basic education. When making a decision on special support, a single pedagogical report is made for the student, which describes all the aspects specified in the national curriculum.

The law allows for the initial decision on special support to be made in some cases before the start of pre-primary or basic education or during pre-primary or basic education without the preceding pedagogical report and intensified support for learning. These situations are specifically defined in the law. This can be done if education for the student cannot otherwise be provided due to a disability, illness, developmental delay, emotional disorder, or other similar special reason. If a decision on special support is made during pre-primary or basic education without providing intensified support, it must be based on a reassessment of the student's situation, for example, as a result of an accident or serious illness, or if the previous assessment proves to be incorrect. In the above cases, the decision is based on Section 17 subsection 4 of the Basic Education Act, and a psychological or medical assessment of the student must be obtained. When the decision is reviewed at statutory intervals or when the need for support changes, a new pedagogical report is always made before a new decision is made for the student.

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The decision on special support specifies the following:

- Primary instruction group.
- Possible interpreting and assistant services.
- Other services specified in Section 31, such as assistive devices needed by the student or support periods, for example, at Valteri Schools.
- Possible individualized subjects, their addition or reduction.
- Organizing teaching deviating from the subject distribution defined in Section 11.
- Exemption of the student from studying a subject.
- Other special teaching arrangements to be decided according to Section 18 of the Basic Education Act, such as other arrangements regarding the content or organization of teaching.
- Decision on extended compulsory education.
- Studying by activity areas.

If the student's support needs change in the above-mentioned matters, a new, as necessary, detailed pedagogical report is made and a new decision on special support is made.

Special Focus Areas in Learning as Differentiation Method

(<https://www.oph.fi/fi/koulutus-ja-tutkinnot/opiskelun-erityiset-painoalueet-eriyttamisen-menetelmana>)

The text essentially discusses how students have the right to receive support in their learning, such as differentiation, remedial teaching, or part-time special education. The goals of the curriculum are common to all, and based on these goals, teachers plan the topics and teaching methods.

One method of differentiation is defining special focus areas in learning, where students concentrate on studying these areas. The goal is to help students grasp the essential content for progressing in their studies. By focusing on the essential aspects, students have the resources to strengthen their learning skills.

It's important to note that students still need other support to cope with studying these defined focus areas and to achieve the common goals set in the curriculum.

Special focus areas in learning can only be used during intensified or special support, and it's the responsibility of the teaching teacher to define these areas. These focus areas are defined in the learning plan or Individualized Education Program (IEP) in subjects where the curriculum is not individualized.

Special focus areas are formed from the core content defined in the curriculum, which are the most important topics for that grade level. Therefore, students still aim to achieve their grade-level goals; these focus areas cannot be from lower grade levels. This focused learning differs from individualization because individualization can also involve lowering the learning level.

If, despite support, a student cannot successfully achieve the goals related to core content, the curriculum for that subject can be individualized. These core contents are exactly the topics that the student is guided to focus on when using special focus areas as a support measure.

When defining these focus areas, it's crucial to identify the core content related to the goals. Local curricula often define content by grade level, often very specifically. When a teacher considers core content for special focus areas, it's appropriate to use the curriculum guidelines as a tool. The guidelines specify the essential content for achieving learning goals. Also, the assessment criteria for good performance at the end of the 6th grade and the criteria for good performance in the final assessment help the teacher determine what areas the students should focus on in their studies. These descriptions and criteria are also

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important guidelines for teachers when assessing students, as when studying with special focus areas, students' performances are evaluated in relation to the goals of the general curriculum.

The learning plan and the special focus areas in different subjects are developed in collaboration with the student and the guardian. Similar collaboration is carried out during special support in the development of the IEP. The guardian and the student should know how much of the subject's content the special focus areas in the learning plan represent and how mastering them relates to the descriptions of good performance or the criteria for final assessment. Support from the guardian is needed in studying based on special focus areas. This support should be documented in the learning plan or IEP."

Most often, teachers decide which textbooks and other study materials are used in teaching to achieve the goals set in the curriculum. Various publishers have released differentiated study materials, and some textbook series also offer books of different difficulty levels (so-called E-textbooks or similar learning materials). If a student studying the general curriculum, but with specific focus areas defined, uses such a book, the teacher needs to assess whether the content of the book covers the objectives of the general curriculum set for that grade level.

In the learning plan or Individualized Education Program (IEP), alongside the selected content for the focus areas, it is described as concretely as possible how the student works, what other support they receive, and in what ways they can demonstrate their competence. It is important that the student can provide various forms of evidence, and they may have assessments that focus on these focus areas. The student and their guardian should know how the demonstration of competence focused on these areas will be reflected in the student's assessment and the formation of the grade marked on the report card. Instruction focused on specific learning areas is often a temporary solution, and the content of the instruction is increased as the student progresses.

Extended Compulsory Education

(<https://www.oph.fi/fi/koulutus-ja-tutkinnot/pidennetty-oppivelvollisuus>)

The duration of compulsory education is distinct from how long it takes to complete it. Under extended compulsory education, compulsory education begins at age 6 with pre-primary education. For other students, it begins in the first year of basic education at age 7.

Extended compulsory education means starting compulsory education a year earlier than prescribed; it does not extend from the middle or end of basic education. Compulsory education ends when a student turns 18 or when they obtain a secondary-level qualification (such as the matriculation examination or a vocational qualification) or equivalent education abroad before turning 18.

According to the National Core Curriculum for Basic Education (Decrees and Guidelines 2014:96), children with severe disabilities are included in extended compulsory education. Severe illness can also be a reason for extended compulsory education. The definition is taken from the document "Government Proposal to Parliament on Legislation concerning Education" (HE 86/1997). When considering whether a child falls under extended compulsory education, their situation should be compared to the aforementioned definition. The decision to include a child in extended compulsory education and, simultaneously, to provide special support for the first time must be justified with a psychological or medical statement indicating the expert's view of the degree of disability.

The decision regarding extended compulsory education is generally made before the start of compulsory education. If a decision has not been made or if the student's situation changes during pre-primary or basic education, the decision can exceptionally be made later. In such cases, the compulsory education period cannot be extended, but the decision affects the size of the student's class and may also impact the organization of teaching. The decision also affects the funding received by the education provider. Decisions are always based on the assessment of the individual student's situation, their strengths, and their need for individual support. All decisions regarding individual students must be justified, and an expert opinion must be attached to the decision.

When the decision is made at age 5, it is noted that extended compulsory education begins on August 1 of the year when the child turns six. If a guardian decides that the child will start pre-primary education at age 5, they receive immediate special support, and a Personalized Curriculum Plan (HOJKS) must be created for them according to the guidelines of the pre-primary education curriculum (2014).

A student under extended compulsory education is always also a student receiving special support. A decision is made regarding their inclusion in extended compulsory education and the provision of special support based on Section 17(4) of the Basic Education Act and

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Section 2(3) of the Compulsory Education Act, respectively. Administrative decisions are made according to administrative law, and the student and their guardian or legal representative are given the opportunity to be heard.

Extended Compulsory Education Decision Process:

The decision regarding extended compulsory education is typically made before the commencement of compulsory education, often at the age of 5. This allows the right to pre-primary, free-of-charge education to commence in the autumn of the year when the child turns 5, which is a year before their compulsory education begins.

The rationale for the decision of an extended compulsory education must be based on a psychological or medical statement. The decision-maker considers the expert opinion, but the content of the statement does not bind the decision-maker.

The decision on an extended compulsory education is a one-time decision. It is not necessary to reconsider the decision when there is a change in the education provider unless separate decisions were made regarding extended compulsory education and special support. The decision on extended compulsory education may be revoked if it is determined, based on pedagogical or other sufficient investigations along with psychological or medical opinions, that extended compulsory education is no longer necessary due to changes in the child's support needs.

If the decision regarding extended compulsory education is revoked, the student falls under the general compulsory education scope. Revoking the decision follows administrative law procedures, including hearing the student and their guardians before making the decision. If a decision is made to terminate the provision of special support, the decision regarding extended compulsory education is also revoked. Decisions are always made based on the best interests and needs of the student, not to form better student groups, for example.

Appeals against decisions regarding extended compulsory education and the provision of special support are made to the regional state administrative agency. The right to appeal also applies to decisions revoking extended compulsory education.

Effective collaboration among different administrative bodies and stakeholders, such as those providing opinions, is crucial to ensure that the need for extended compulsory education is communicated to decision-makers in a timely manner and that the child is directed toward the necessary support. According to the National Core Curriculum, the local curriculum must specify how a child is directed to extended compulsory education and outline multidisciplinary cooperation in the process. It also describes cooperation with pre-primary education and other early childhood education, as well as the responsibilities and

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division of work among different stakeholders. Furthermore, it emphasizes the importance of providing timely information to the child's guardian about the various options for extended compulsory education and the impacts of these choices, as the guardian decides whether the child participates in pre-primary education before compulsory education.

The decision to start pre-primary education and its duration, as well as the commencement of basic education, should be planned based on the child's overall situation, progress, and support needs. If a child starts pre-primary education directly as compulsory education at age 6, the decision on whether pre-primary education lasts for one or two years is made during the first year of pre-primary education when it is seen whether the child is ready to transition to the first grade after one year of pre-primary education or if they still need another year of pre-primary education.

Information for Guardians Regarding Pre-primary Education and Extended Compulsory Education:

It is important to inform guardians that if they choose pre-primary education for their child at age 5, the child will then start basic education at the age of 7. A third year of pre-primary education may only be considered in very exceptional cases. Such a decision can only be made if during the second year or towards the end of pre-primary education, it is observed that the child has not progressed according to the set goals during pre-primary education, but they have the potential to achieve significantly higher goals in basic education than if they were to start at age 7. This rare situation may arise, for example, if the child has been ill for long periods during pre-primary education.

Whenever a child does not start basic education at age 7, a decision is made according to Section 27 of the Basic Education Act. According to this section, based on psychological and, if necessary, medical assessments, the education provider can grant permission for the child to start basic education later than prescribed.

It is always crucial to know whether a child is in pre-primary or basic education and in which grade they are. This applies even to severely disabled students or students studying by subject areas in basic education.

For a child under extended compulsory education, the so-called pre-primary education before compulsory education starts at age 5 is subject to the same pre-primary education norms as pre-primary education starting at age 6 for students without this decision. The municipality decides on the location for the pre-primary education of a child under extended compulsory education. Pre-primary education is always conducted according to the pre-primary education curriculum, regardless of where it is provided. During pre-primary education, the child does not study by subject areas, even if they are placed in the same

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group as students studying by subject areas in basic education. Each child's individual goals are outlined in the Personalized Curriculum Plan (HOJKS). A child is entitled to at least 700 hours of pre-primary education per academic year. When a child is 5 years old, the guardian decides whether the child participates in pre-primary education, and at age 6, it becomes part of compulsory education.

In basic education, a student under extended compulsory education either studies by subject areas or by subject domains. The decision for domain-based teaching is made as part of the decision regarding special support. The reason for the decision cannot be based on the student's class placement. Students always have the right to study primarily by subject areas. Teaching is organized by subject domains only when it is determined that the student cannot even handle the individualized curriculum of subjects. Students under extended compulsory education are subject to the same regulations as others, such as the Government Decree on the National Objectives for Basic Education and the Distribution of Lesson Hours in Basic Education (1435/2001). Local curriculum guidelines based on these regulations are also followed. Any deviations for individual students, such as exemption from studying a certain subject or differences in teaching hours for a subject, must be decided in the decision regarding special support under Section 18 of the Basic Education Act.

Students studying by subject areas receive the same weekly lesson hours as those in the same grade studying by subject. Any deviation from this weekly hour count for an individual student must also be decided as part of the decision regarding special support under Section 18 of the Basic Education Act. Unless the deviation is temporary, such as due to illness, a decision must always be made, and its necessity reassessed as per the Basic Education Act.

The Basic Education Decree specifies the maximum group sizes for students under extended compulsory education. These sizes cannot be temporarily exceeded. For instance, if a student under extended compulsory education is integrated into a general education group, the maximum group size of 20 students is observed for all lessons. Students are counted based on their attendance during each lesson. Therefore, the group may temporarily exceed the maximum number if flexible arrangements ensure that the limit is not exceeded during any single lesson. In simultaneous teaching situations where there are two teachers in the classroom, the students are counted as part of both teachers' groups, so the total size of such a group can exceed the specified limit.

The regulation does not categorically prevent placing multiple students under extended compulsory education in the same teaching group. The education provider must ensure that the curriculum goals can be achieved within the teaching group. Consequently, the law may require that the group size be smaller than the maximum of 20 students. When planning teaching arrangements, the education provider must consider the nature of disabilities or

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illnesses of students under extended compulsory education, support measures, other arrangements, and the conditions of other students in the group.

The regulations on group sizes also apply to pre-primary education. The regulations on group sizes and staffing in daycare centers apply to pre-primary education provided in daycare centers.

Decisions regarding special support and extended compulsory education must always be based on individual considerations. A decision to terminate extended compulsory education cannot be made simply because the group size would otherwise exceed the specified limit. The education provider cannot categorically decide that students with a specific diagnosis, such as mild intellectual disabilities, will always be taught in a specialized school, class, or specific pre-primary group. The decision on the educational setting is made individually in conjunction with the decision regarding special support. Similarly, the education provider cannot decide on only one of three implementation methods; rather, the choice of implementation is made on an individual basis with unique justifications for each child.

The education of students under extended compulsory education is governed by the following provisions of the Basic Education Act (628/1998). Children and young people permanently residing in Finland are subject to compulsory education. Compulsory education starts in the year the child turns seven. Compulsory education ends when the student turns 18 or before that if they complete a secondary level qualification (matriculation examination or vocational qualification) or equivalent foreign education.

According to Section 26 a(1) of the Basic Education Act (1288/1999), a child is entitled to preschool education in the year preceding the start of compulsory education. Under Section 26(1) of the Basic Education Act (477/2003), a student under extended compulsory education must participate in preschool education organized in the year when compulsory education begins. Preschool education lasts for one year. However, for students under extended compulsory education as referred to in Section 25(2), special education provided during preschool education can last for two years (Pol 9 § 2 mom.). According to Section 3(2) of the Basic Education Decree (852/1998), preschool education is provided for a minimum of 700 hours per year.

The group size for students under extended compulsory education is regulated in Section 2(3) of the Basic Education Decree (893/2010) as follows: In the education provided for students under extended compulsory education as referred to in Section 25(2) of the Basic Education Act, the maximum number of students in a class is eight. However, in a class consisting of severely intellectually disabled students, the maximum number allowed is six. If education is provided for students mentioned in this section together with or in the same group as those receiving special support as mentioned in the second paragraph, the

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maximum group size is determined by the type of supported students in the group. If education for a student mentioned in this section is provided together with other students not mentioned in this or the second paragraph, the maximum group size can be 20 students.

Under Section 3(2) of the Compulsory Education Act (1214/2020), education for students under extended compulsory education as referred to in the second paragraph can be organized in a way that the second official language or a foreign language is not taught as a common subject. In education for students under extended compulsory education, subjects can be combined into subject units and divided into sub-areas as specified in the local curriculum.

Special Instruction for Functional Areas

(<https://www.oph.fi/fi/koulutus-ja-tutkinnot/toiminta-alueittain-jarjestettava-opetus>)

Instruction by functional areas is provided to a student when the student is unable to study even individualized learning objectives for subjects. This support material assists teachers in preparing pedagogical assessments and helps education providers in making decisions regarding instruction by functional areas. The material is especially helpful in situations where a student transitions to instruction by functional areas.

The goal of instruction by functional areas is to provide the students with knowledge and skills to enable them to live as independently as possible. The National Core Curriculum specifies that instruction by functional areas is provided only when it is determined that the student is unable to study even individualized learning objectives for subjects. However, functional areas may include objectives and content of a specific subject if the student has strengths in that subject. (National Core Curriculum for Basic Education 2014, Chapter 7.4.6.) This requires that the student can study them with supported individualized goals.

Instruction by functional areas is intended for students under extended compulsory education who have severe intellectual disabilities, other disabilities, or serious illnesses. The provision of education by functional areas instead of subject-based instruction for severely intellectually disabled students is specified in Section 9(3) of the Government Decree on National Objectives and Distribution of Lesson Hours in Basic Education (422/2012) (hereinafter the Lesson Hours Decree).

According to the National Core Curriculum for Basic Education (2014, Chapter 7.4.6), education for other disabled or seriously ill students may also be justified by reasons related to the student's health. For these students, a decision on special support, extended compulsory education, and instruction by functional areas, as well as a decision based on Section 18(1)(3) of the Basic Education Act (628/1998) on special education arrangements, is required.

Instruction by functional areas is decided as part of the decision on special support (Basic Education Act 642/2010, Section 17(2)). When deciding on instruction by functional areas, either Section 9(3) of the Lesson Hours Decree or Section 18(1)(3) of the Basic Education Act (628/1998) is always mentioned as the applicable provision.

A decision on extended compulsory education is also made as part of the decision on special support. Extended compulsory education falls under the Compulsory Education Act

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(1214/2020, Section 2(3)): "If it is not possible to achieve the objectives set for compulsory education in the Basic Education Act within nine years due to the child's disability or illness, compulsory education starts earlier (extended compulsory education)." It is reasonable to make these decisions simultaneously. However, a decision on extended compulsory education and instruction by functional areas does not necessarily have to be made in the same decision but can be two separate decisions as part of special support.

A decision on special support is made through an administrative decision. According to administrative law, administrative decisions must be given in writing and must be justified. The justifications must indicate which factors and evidence influenced the decision and mention the applicable provisions (Administrative Procedure Act 43 § 1 mom, 45 § 1 mom). The pedagogical assessment should include reasons for the aspects covered in the decision on special support. According to Section 17(3) of the Basic Education Act, if necessary, the pedagogical assessment must be supplemented with a psychological or medical expert opinion or equivalent social assessment.

In certain cases, a decision on special support can be made before the start of preschool or basic education or during preschool or basic education without a preceding pedagogical assessment and provision of intensified support. This is specified in Section 17(4) of the Basic Education Act. This approach can be taken if it is not otherwise possible to provide education due to the student's disability, illness, developmental delay, emotional disturbance, or similar reasons. If a decision on special support is made during preschool or basic education without providing intensified support, it must be based on a reassessment of the student's situation, for example, due to an accident or serious illness or if the previous assessment proves to be incorrect. In such cases, a psychological or medical assessment must be obtained to demonstrate that education cannot be provided otherwise. When reviewing the decision on special support at statutory intervals or when the need for support changes, a pedagogical assessment must always be conducted before making a new decision.

Pedagogical assessment:

According to Section 17(3) of the Basic Education Act, before making a decision regarding special support, the education provider must conduct a pedagogical assessment of the student. Collaborating during the pedagogical assessment and planning instruction is crucial for determining the student's support needs and ensuring successful implementation. Both the student and the guardian must be informed about the pedagogical assessment and any expert opinions associated with it before their consultation.

The education provider obtains:

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- ✓ a written report from the teachers responsible for the student's education regarding the progress of the student's learning.
- ✓ a written report, developed in multidisciplinary collaboration with student welfare professionals, concerning the intensified or special support the student receives and the overall situation of the student.

Based on these reports, the education provider makes a written assessment of the student's need for special support. The combination of these reports and the assessment formed on their basis is referred to as a pedagogical assessment (Basic Education Act Section 17(3) (642/2010)).

The written pedagogical assessment describes:

- the student's progress in learning.
- the overall situation of the student's learning and schooling from the school's, student's, and guardian's perspectives.
- the intensified or special support received by the student and an assessment of the effects of different support measures.
- the student's strengths, interests, learning readiness, and special needs related to learning and schooling.
- an assessment of how the student can be supported with pedagogical, learning environment-related, guidance-related, student welfare-related, or other support arrangements.
- an assessment of the need for special support.
- an assessment and rationale for whether the student needs an individualized curriculum in one or more subjects.

An assessment and rationale for whether the student is suited for thematic, functional learning areas rather than subject-based education.

In the preparation of the pedagogical assessment, previously made pedagogical evaluations and the student's learning plan are utilized. If the student has already received special support, previously made pedagogical assessments and Individualized Educational Plans (IEPs) are utilized. In addition to the pedagogical assessment, other opinions may need to be obtained as part of preparing for the decision on special support, such as psychological or medical assessments, or equivalent social assessments. If the student has a rehabilitation plan or other plans, those may also be utilized with the guardian's consent (Basic Education Curriculum 2014, 66).

- The pedagogical assessment must describe all the above aspects that are standard in the curriculum. Opetushallitus's model forms "Pedagogical Assessment for Special Support" and "Proposal Based on Pedagogical Assessment for the Content of

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Decision on Special Support" can be utilized in preparing the pedagogical assessment. Links to these forms can be found at the end of this page.

In a pedagogical assessment for making a decision on special support based on education organized by areas of activity, special attention must be paid to the following aspects, which are jointly developed in multi-professional collaboration with teachers and student welfare professionals:

- Description of the support the student has received and how it is determined and justified that the student is unable to study even individualized learning objectives for subjects.
- How education organized by areas of activity supports the student's competence, learning, and overall development, and promotes and maintains the student's capacity to learn better than subject-based instruction, in the student's best interest.

The student always has the right to study subjects. When considering education organized by areas of activity for the student, it is important to justify in the pedagogical assessment how the definition of education is fulfilled, i.e., "education is organized by areas of activity only when it is determined that the student is unable to study individualized learning objectives for subjects." If subject-based instruction is in the best interest of the student, the educator must consider how to provide learning support in order for subject-based instruction to be possible.

The justifications for transitioning to education organized by areas of activity are explained in the pedagogical assessment in the following sections:

Assessment of the enhanced or special support the student has received in collaboration with student welfare professionals.

- What kind of support has been provided?

Assessment of the overall learning and school situation of the student in collaboration with student welfare professionals, as well as from the perspectives of the student and the guardian.

- Has the support been sufficient?
- Has the student progressed in their studies?

It is important to ascertain the opinions of the guardian. It is necessary to explain to the guardian how education organized by areas of activity will affect the child's secondary education. The student's opinion is determined according to their age and developmental stage.

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The student's strengths and interests, learning readiness, and special needs related to learning and school attendance:

- The planning of Education organized by areas of activity is based on the student's strengths. Justify how education organized by areas of activity supports the student's strengths and learning readiness in learning independent living skills.
- Education is organized by areas of activity only when it is determined that the student is unable to study even individualized learning objectives for subjects. Justify why the student is unable to study even individualized learning objectives for subjects.
- The areas of activity may include the objectives and content of a single subject if the student has strengths in this subject. Explain and justify to the guardian and the student that the instruction does not include the learning objectives for any grade in the subject.

Evaluation of the pedagogical, learning environment-related, guidance-related, student welfare-related, or other support arrangements that can support the student:

- Education organized by areas of activity supports the student's overall development and promotes and maintains the student's capacity to learn. Describe and justify what kind of support the student benefits from and how education organized by areas of activity promotes and maintains the student's capacity to learn. The goal of education organized by areas of activity is to provide the student with knowledge and skills to enable them to function as independently as possible.
- In education organized by areas of activity, different situations in the school day are utilized for learning, and the learning environment is developed to be functional and motivating for the student. Justify the support needed for the learning environment, such as motivating learning materials (consider the student's strongest sensory channel and the best way to learn).

In the pedagogical assessment, justify how the student's education is supported by pedagogical, learning environment-related, guidance-related, or other support arrangements so that Education can be organized according to the Basic Education Curriculum Guidelines (2014):

- Motor skills education includes planning and guidance of motor activities, balance, coordination, rhythm, endurance, and muscle strength development.
- Language and communication education includes linguistic awareness, expression, concept and vocabulary, recognition and use of signs, symbols, letters, and words, as well as areas that promote thinking. Communication skills are practiced in different situations during the school day.
- Social skills education includes functioning in different environments and practicing interaction and emotional skills.

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- Cognitive skills education should support the development of processes related to learning, memory, and thinking. Cognitive skills learning includes stimulation and practice of senses, choice, classification, problem-solving and decision-making, and learning cause and effect relationships. The goal of learning is to develop basic skills in reading, writing, and mathematics. Content from subjects can provide material for learning cognitive skills.
- Daily life skills education includes health and safety, everyday skills, housing and mobility, and leisure time activities. Practicing daily life skills creates opportunities for the development and practice of motor skills, language and communication, information and communication technology skills, social skills, and cognitive skills. These, in turn, strengthen the mastery of daily life skills.

In the justifications of the pedagogical assessment, attention can also be paid to the objectives of Education organized by areas of activity and how education supports the student's skills through learning environment arrangements, interpreting and assistance services, or for example, Valter's guidance services:

- The goal of motor skills learning is to strengthen the student's body awareness, promote the development of gross and fine motor skills, and provide opportunities to practice skills in various everyday situations.
- The starting point for learning communication skills is the formation of interaction and the practice of understanding and producing communication, based on it. The goal is for the student to interact with their environment, be understood, and understand other group-students and adults themselves. The student is ensured the opportunity to use communication methods that are appropriate for them. Alternative communication methods should be available to the student, if necessary.
- The goal of learning social skills is the development of the student's skills in group work and participation.
- The goal of learning cognitive skills is for the student to be activated and learn to use their senses to perceive the surrounding reality.
- The goal of learning daily life skills is to increase the student's active participation in their environment's activities and promote independence and self-reliance.

Special Schools in Finland

In Finland, special schools can be maintained by the state or municipalities. Larger cities have their own special schools. In addition, there are a few Valteri schools (state-maintained) and Elmeri schools in Finland. Next, we will introduce Tiernan School, a special school maintained by the city of Oulu, as well as all Valteri schools and Elmeri schools in Finland.

Tierna’s school in the Oulu area: (<https://www.ouka.fi/tiernan-koulu>)

Tierna’s School is a special school with 230 students in grades 1-9. It provides education for students with special needs as a centralized service by the city of Oulu. The hospital school provides education for approximately 400 students annually at the regional level.

The school operates in seven different locations throughout Oulu. In addition, the Youth Workshop Center houses a "TUVA" group, and there is one upper school age group at Pohjankartano School.

The Heinätori unit offers demanding special support in small group teaching for grades 1-9. The aim of Heinätori is to create readiness for healthy self-esteem and initiative in students. Collaboration and tolerance are essential for functioning in various groups. At Heinätori, students are guided to take responsibility for their actions and choices.

The Kajaanintulli unit provides education for students with demanding behavioral challenges. Many students have autism spectrum or other neuropsychiatric disorders. The school offers a safe learning environment where students practice emotional and social skills in close interaction with an adult. The unit has eight teaching groups, each with 5-6 students. Students are in grades 1-9. Each class has a teacher and an instructor working as a team. The number of students varies each year between 45-50. Additionally, the school has a consulting special education teacher whose task is to support the student's learning in their local school.

The Kasarmintie unit offers teaching for students with demanding special needs. Students have the opportunity to study at the school for the entire basic education period. Students study by activity areas. The aim of the education is to provide students with knowledge and skills to be as independent as possible in their lives. The purpose of the education is to support the student's holistic development and maintain learned skills. Activity areas are intertwined in the education, and it is carried out multidisciplinary. The unit is part of the Elmeri school network.

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At the Leinonpuisto unit of Tiernan School, students with special needs study. Students have learning difficulties due to intellectual disability, developmental delay, emotional disturbance, or other comparable reasons. Students study according to personal curriculum either by subject or by activity area. Leinonpuisto has three units: Koivikko, Kuusikko, and Männikkö. Koivikko and Kuusikko have primary school students and Männikkö has secondary school students. The school building is barrier-free, and the facilities are designed to meet the needs of students with special needs.

The purpose of the Pajaluokka unit's teaching and activities is to create a positive learning attitude, as well as to revive study and life management skills, initiative, and self-motivation. The share of workshop work in teaching varies from student to student. The aim is to ensure daily opportunities to work on skills and art subjects.

The Hospital School is also part of the unit. The municipality where the hospital is located is obliged to provide education to a student receiving treatment at the hospital to the extent possible considering their health. The municipality responsible for the hospital treatment is also obliged to provide education and support to other compulsory education students in specialized care to the extent justified by their health, pedagogical special needs, and medical care and rehabilitation measures, if providing education is not in the student's best interest despite other support measures according to this or other laws. The basis for the hospital school's rehabilitative education is a functional and close cooperation with specialized medical care. The healthcare team responsible for the student's treatment, the student's guardians, the student's own school, and the hospital school all work closely together to support the student comprehensively. The student's place in hospital education is determined according to the area of specialty care, and therefore the Hospital School unit of Tiernan School serves students from all municipalities in the Northern Ostrobothnia Hospital District area.

National special school and learning and guidance center Valteri: (<https://www.valteri.fi/>)

In Finland, there is a separate Valteri learning and guidance center. Valteri offers services that help identify and solve everyday challenges in municipalities. Valteri is a national learning and guidance center under the Ministry of Education and Culture, supporting the implementation of the local school principal.

The Valteri Learning and Guidance Center provides support for children's and young people's learning, development, rehabilitation, and educational arrangements in daycares and primary schools.

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We operate nationally in both large cities and small municipalities, as needed. The benefits of our operations are visible in the daily lives of children, guardians, and professionals in the field.

Each Valteri school has an associated Valteri School. Our schools offer places for children and young people in need of special support, as well as the opportunity to study and receive supportive learning and rehabilitation during school hours.

Mikael (<https://www.valteri.fi/koulu/mikael/>) is a Valteri School located in Mikkeli. The school operates under the Ministry of Education and is part of the national Valteri Learning and Guidance Center. The school offers pre-primary and basic education. Students and support period students study in age group-based class groups. The class is guided by a multidisciplinary team consisting of a teacher, instructor, and possibly a speech therapist, physiotherapist, and occupational therapist. In Valteri's different units, education, learning-supportive rehabilitation, and function-enhancing guidance form a cohesive whole. The collaboration of the multidisciplinary team complements each other. Valteri Mikael's guidance services support the student's studies in their local school.

Tervaväylä (<https://www.valteri.fi/koulu/tervavayla/>) is a Valteri School located in Oulu. The school operates under the Ministry of Education and is part of the National Valteri Learning and Guidance Center. The school offers pre-primary and basic education. Students and support period students study in age group-based class groups. The class is guided by a multidisciplinary team consisting of a teacher, instructor, and possibly a speech therapist, physiotherapist, and occupational therapist. The students mainly consist of hearing-impaired students and students with severe mobility impairments.

Mäntykangas (<https://www.valteri.fi/koulu/mantykangas/>) is a Valteri School located in Kuopio. The school operates under the Ministry of Education and is part of the National Valteri Learning and Guidance Center. The school offers pre-primary and basic education. Students and support period students study in age group-based class groups. The class is guided by a multidisciplinary team consisting of a teacher, instructor, and possibly a speech therapist, physiotherapist, and occupational therapist. In Valteri's different units, education, learning-supportive rehabilitation, and function-enhancing guidance form a cohesive whole. The collaboration of the multidisciplinary team complements each other. Valteri Mäntykangas's guidance services support the student's studies in their local school.

Onerva (<https://www.valteri.fi/koulu/onerva/>) is a Valteri School located in Jyväskylä. The school operates under the Ministry of Education and is part of the national Valteri Learning and Guidance Center. The school offers pre-primary and basic education. Students and support period students study in age group-based class groups. They often need support due to difficulties in seeing, hearing, or language-related issues. The school provides preschool

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education, basic education, or additional education. Teaching takes place in class groups according to age. In addition to the teacher, the class group may also include professionals such as a physiotherapist, speech therapist and occupational therapist. Valteri School Onerva also provides support for students attending other schools. In Valteri's different units, education, learning-supportive rehabilitation, and function-enhancing guidance form a cohesive whole.

Ruskis (<https://www.valteri.fi/koulu/ruskis/>) is a Valteri School located in Helsinki. The school operates under the Ministry of Education and is part of the National Valteri Learning and Guidance Center. The school offers pre-primary and basic Education. Students and support period students study in age group-based class groups. The class is guided by a multidisciplinary team consisting of a teacher, instructor, and possibly a speech therapist, physiotherapist, and occupational therapist. In Valteri's different units, education, learning-supportive rehabilitation, and function-enhancing guidance form a cohesive whole. The collaboration of the multidisciplinary team complements each other. Valteri Ruskis's guidance services support the student's studies in their local school.

Skilla (<https://www.valteri.fi/koulu/skilla/>) is a Valteri School and Skilla is located in Helsinki. In Skilla school, the teaching is conducted in the Swedish language. Skilla is a school for visually impaired students of the Swedish-speaking community in Finland. The school falls under the jurisdiction of the Finnish National Agency for Education and is part of the nationwide Valteri Center for Learning and Expertise. The school offers preschool and primary education. The school's own students and support period students study in groups organized by age. In addition to a teacher and instructor, a multidisciplinary team including a speech therapist, a physiotherapist, and an occupational therapist may be involved.

Elmeri schools: (<https://elmerikoulut.fi/>)

There are 10 Elmeri schools located in different parts of Finland, either in connection with special care or social and healthcare districts, or physically close to these services. Elmeri schools are special schools that provide education to children and young people with intellectual disabilities, autism spectrum disorders, or a need for psychosocial support. The organizers of education in Elmeri schools are special care districts, healthcare and social services consortia, or municipalities. The schools mainly provide basic education. Some schools also offer preschool education, additional education, and short-term education for students on interval, research, and rehabilitation periods. The schools are typically small school units. In the academic year 2020-2021, there were about 300 students enrolled in the schools.

Carea School is located in the Kuusankoski district of Kouvola and has been a basic school of basic education in Kouvola since August 1, 2020. The school provides demanding special

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support basic education to children and young people with, for example, severe disabilities, autism spectrum disorders, and a need for psychosocial support. The school provides education by activity areas currently for all students and, as needed, according to individualized curricula by subject. Education is offered in grades from preschool to 9. The school provides morning and afternoon activities, as well as daycare during school holidays. Carea School is a regional school for neighboring municipalities, and students come from the entire Kymenlaakso region. There are three classes in the 2023-2024 school year, and the staff consists of three special education teachers and 18 school assistants. The school is currently operating in temporary premises, with plans to move to the Marjoniemi school in central Kouvola as part of the Kouvola city's school network renewal.

Honkalammi School is an Elmeri school located in Ylämylly, Liperi. The school has changed in recent years due to the establishment of welfare areas at the beginning of 2023. According to the new law on the provision of social and health services, welfare areas cannot provide education. Despite the changes, Honkalammi School students have continued their studies in the familiar school building and environment with familiar adults.

Mylly-Antti School is located in Turku, Varsinais-Suomi. The school offers preschool and basic education to children and young people with, for example, intellectual disabilities and/or autism spectrum disorders and/or a need for psychosocial support. Education at the school is organized by activity areas, and morning and afternoon care is available. Rehabilitative basic education is provided using alternative communication methods. Consultative services to municipalities are also available. The school has a principal, five special education teachers, and 25 school assistants. Mylly-Antti School hosts student teachers, special education teachers, and practical nurses for internships and familiarization visits.

Myllärin School is located in Rovaniemi. The education is provided by the City of Rovaniemi. Myllärin School provides preschool and basic education to children and young people with intellectual disabilities, autism spectrum disorders, a need for psychosocial support, or multiple disabilities. Education is structured and emphasizes strengthening interaction and communication skills, practicing social skills, supporting self-regulation, and taking sensory functions into account. There are five small classes at Myllärin School. The school has five special education teachers and 22 school assistants. In addition, one special education teacher works in the Kolpene Rehabilitation Class of the Lapland Welfare Area and is part of a multidisciplinary team. Students have the opportunity to participate in morning and afternoon activities and holiday care at Myllärin Workshop organized by the Lapland Welfare Area.

Niittyvillan School is a special school maintained by the City of Seinäjoki. All students at Niittyvillan School require demanding special support. The school has an accessible learning

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environment. The education is provided by special education teachers and school assistants. The school also has a hybrid class that includes students from both Interval and Vanamo Schools.

Rajasalmi School is located on the shore of Lake Pyhäjärvi in the Pitkäniemi area of Nokia, about ten kilometers from the center of Tampere. The school is a basic school for Nokian students needing special support. The school provides preschool and basic education in activity areas for students studying in Nokian based on needs or other students needing special support and specialized healthcare development students in the same building, as well as students needing special support from neighboring municipalities. The students at the school have broad learning difficulties, and typical student groups include multi-needs, autism spectrum, behaviorally symptomatic, and psychologically symptomatic intellectually disabled students. Education is provided in activity areas and subjects are individualized. Important aspects of education include individual solutions, structuring, rewarding based on individual assessments, student participation, and active teaching methods. The school provides rehabilitative afternoon activities on school days for Nokian students. Rajasalmi School has 30 student places and five special class teachers. The school has a Vice Principal, five special education teachers, and 20-25 school assistants.

Rinnekodin School is a special school in Espoo. The school provides demanding special support education to school-age children and young people with developmental disabilities-related behavioral or care challenges. Our goal is to ensure the growth, development, learning, and compulsory education of students so that they can continue their education after attending Rinnekodin School, move on to further studies, or transition to independent living. Education is implemented in small groups according to an activity-based curriculum, in collaboration between the teacher and assistants.

Sateenkaaren Special School is located in Pieksämäki, Southern Savonia, about ten kilometers from the center of Pieksämäki. The school is a comprehensive school that provides preschool and basic education to children and young people requiring demanding special support. The school is surrounded by Vaalijala's extensive children and youth rehabilitation services residential units and other multidisciplinary services to complement the student's rehabilitation needs. Education and rehabilitation form a supportive whole in our school. The school provides education to children with intellectual disabilities, autism, and psychosocial support needs, whose local school cannot meet their individual learning needs or who require extensive rehabilitation to support their growth, development, and learning. The school provides education in activity areas and subjects, utilizing structuring and multisensory teaching, as well as alternative communication methods. The education emphasizes multidisciplinary and active learning, as well as sensory rehabilitation. The school also provides afternoon activities and consultative services to municipalities. The education focuses on a rehabilitative perspective to support students' self-esteem, strengths, self-care skills, social interaction, and emotional skills. The educational and

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developmental goals are set in collaboration with families and other rehabilitators. The goals are set to serve the student's independent daily living. The school has ten special education small groups. Sateenkaaren School provides education to both regular students and students on short rehabilitation cycles. There are around 70 regular students, with an additional 5-10 students in short-term rehabilitation per week. Sateenkaaren Special School has a principal, an administrative secretary, ten special education teachers, and around twenty school assistants/school aides. In addition, the school hosts the guides of the students living in residential units, around 40-50 in total. These local guides are employees of the residential units. Students are welcome to practice working with students needing special support at our school. Our school is happy to collaborate with parties conducting theses or research.

Renkomäki School is located in the Aurajoki Multifunctional Building in Lahti, Finland. The school currently has a total of 430 students in grades 1-6 and demanding special support classes 0-9 (Elmeri School). There is also preschool education from Renkomäki day care center, after-school activities for school children, and a library in Aurajoki. The Multifunctional Building and environment offer diverse opportunities for holistic learning. In Aurajoki, we learn to fly safely together! We meet each person with respect and encourage everyone to grow and develop. The school provides demanding special support education to children and young people with, for example, severe disabilities, autism spectrum disorders, and a need for psychosocial support. Education is organized by activity areas and according to individualized curricula by subject. Renkomäki Elmeri School is regional, and students come from the entire Päijät-Häme region. There are 6 Elmeri classes in the school, with 7 special education teachers and 26 school assistants.

Tiernan School in Oulu (previously introduced) is also an Elmeri School.

Conclusion of Special Education in Finland

Inclusion in Finland

- The idea of inclusion is based on a local school policy.
- All students go to the local schools if that is best for the child's growth and learning.

Local school policy

- Local school policy means that a student goes to the nearest school and gets the support he/she needs. The idea is to bring the support as close to the student as possible.
- It is important to determine the school where the resources of support meet the student's needs in the best possible way. This means that the student may also go to a study place other than the nearest school if their needs require so.

Student support

- The student is always on his/her own stage of support (general support, intensified or special support) and it goes for all their studies in school.
- The student can also get intensified or special support based on their behavior, interaction, or other challenges although he/she doesn't have any learning disabilities.
- The student doesn't have to have any diagnosis to get special needs education.
- Multiprofessional cooperation includes collaboration with the school social worker, the school psychologist, and the school nurse.
- Typical reasons for special needs education are reading and writing difficulties, mathematics difficulties, neurodevelopmental disorders, developmental language disorder, dyslexia/ dyscalculia, ADHD/ADD, speech difficulties, and conduct disorders.

Pedagogical documentation

- It is drawn up in collaboration with the class teacher, special education teachers, and guardian.

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- It is documented online on the WILMA system and is updated and evaluated at least once a year.
- It is very important that all the information about the student is transferred through the documentation to the new teachers and all the forms of support are carefully written down on the document.

General support

- General support belongs to everyone.
- The following forms of support are used in general support: differentiation, collaborative teaching, remedial teaching (also proactive), guidance counseling, student welfare, part-time special needs education, different aids, assistant services, guidance, and support service.
- A pedagogical document (a learning plan) can also be made for a student in general support if necessary.

Intensified support

- If general support is insufficient, the level of support will be updated to intensified support.
- Teachers draw up a pedagogical evaluation in collaboration with parents.
- After that the learning plan is made for the student. It defines in great detail the forms of support the student needs.
- Practically, the means of general support are also used on the intensified level, but they are more planned, effective, and regular than in general support.
- In addition to that student can have the key-contents of a subject defined personally in their learning plan. The objective of defining key contents is to help a student manage through the general goals of the subject.

Special support

- If the intensified support is also found deficient, a multi-professional team draws up a pedagogical statement for the student.
- An administrative decision is made based on the pedagogical statement.
- The personal IEP (individual educational plan) is drawn up for the student.
- Student is justified also for the full-time special needs teaching.

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- When needed, the subject goals can be individualized which means that the student studies the subject according to their own specific objectives determined in the IEP. The evaluation of the subject is also individual and follows the same goals.

All teachers

- Classroom teachers take care of students getting general, intensified, or special support.
- Classroom teachers and special needs teachers work together intensively on a daily basis.
- The planning of support and pedagogical documentation are drawn up together.
- A classroom teacher is responsible for the pedagogical documents of general and intensified support.
- The forms of support are differentiation, remedial teaching (also proactive), structuring of lessons, etc.

Special needs teacher

- Laaja-alainen erityisopettaja - A particular type of special needs teacher in the Finnish education system.
- A special needs teacher works with the whole age group and offers support for all the students whether they need general, intensified, or special support.
- Special needs teachers do not have their own class or specific students.
- They work together with the classroom teacher in a class or teach their own group that is formed flexibly on demand.
- Offers mainly part-time special needs teaching.

Special class teacher

- A special class teacher works mainly with the full-time special needs students in their own class, usually including students from different grades.
- The students in special needs classes get advanced special support. Students in those classes have a large variety of different special needs, and subject goals are heavily reduced and individualized to the point where some students rather study general skills (including motoric, cognitive, social, and communicative skills as well as everyday life skills) than specific school subjects.

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- This kind of teaching aims to support, enhance, and maintain the child’s development as a whole. SUOMEN KOULUTUSJÄRJESTELMÄ (<https://okm.fi/koulutusjarjestelma>)

4. Case Studies

4.1. The Case of E.E.E.EK. of Chios, Greece

School structure and operation

Our school is located in Chios, in the North Aegean. The EEEEEK of Chios has been operating since 2003.

- The course lasts from five to eight years, according to the specific educational needs of each student.
- Today, our school has 24 students aged 13-23, with mental retardation, multiple disabilities, down syndrome, and autism.

The main subjects taught are Mathematics, Greek Language, ICT, Physical Education, and Music. At the same time, three workshops operate:

- ❖ Agriculture, Food, and Environment workshop, where students specialize in a variety of activities:
 - on the cultivation of vegetable, aromatic, and ornamental plants, as well as its techniques such as sowing, cuttings, transplanting, use and selection of appropriate tools, plant growth, plant care, biological plant protection, etc.
 - in learning various horticultural applications.
 - in the construction of decorative objects, the garden, and the terrace.
 - in the construction of flower arrangements using various natural materials, etc.
- ❖ Workshop of Tourist Professions, where the main teaching axes of the workshop are the following:
 - Cleanliness and hygiene in the kitchen.
 - Safety in the kitchen.
 - General information on nutrition and food.
 - Knowledge, use, and familiarity with tools, utensils, and electrical appliances.
 - Preparation of drinks, food, and sweets for individual and mass catering.
- ❖ Handicraft Workshop, where students express themselves creatively.

In our school, there are also supporting structures for personalized support according to the unique needs of each student. So, we have: Occupational therapy, Speech therapy, Physical therapy, Psychological Support, Social Work, and Special Support Staff.

The school self-management canteen operates with products made by our students to enhance and encourage their pre-vocational skills. Students are trained in the preparation of small tithe meals. They learn the use of materials and devices, hygiene, and safety rules. Social skills are trained and cooperation and interaction are enhanced in a sheltered semi-

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professional environment. A group of students travel by city bus to the city center once a week and buy raw materials from the supermarket to supply the canteen with food materials. After they finish, they visit services first to know where each service is and then to make various transactions, such as the post office, the bank, etc.

Once a school year, the bazaar of EEEEEK takes place usually in May with products made by the students from all over the workshops. This bazaar is a very good motivation for our students to create and learn new things. Also, at the bazaar, the students communicate with people and increase their sociality.

We collaborate with schools, services, agencies, and parents' associations (school parents association, autism association, etc.) intending to include and integrate our students into society. We take part in artistic competitions utilizing the special talents of our students - we participated in a singing and painting competition (our students won first and second prizes in Greece) - raising their self-esteem and encouraging their creativity. As part of the workshops, we visit various companies and our students are informed about them. Every year we participate in school activity programs related to the environment, culture, and health. Through these programs specialists (doctors, rescuers, firefighters, etc.) visit us for information or we visit them in small groups.

Our teachers every year are trained in behavior issues, new technologies, safety, and first aid and exchange good practices with each other and with colleagues from other schools. Also almost every year we implement e-twinning programs and Erasmus as well to open our horizons to renew ourselves, to exchange views with colleagues from other countries, and to learn new teaching systems and methods or to adapt some of them to our own context

Our school's aim

Provide academic knowledge adjusted quantitatively and qualitatively to the special needs and possibilities of the students through the subjects: Language, Mathematics, Social and Vocational Education, Informatics, Music, and Gymnastics.

It places special emphasis on the development of social skills in the context of the operation of the work groups, i.e. in the fields of individual care, interpersonal relationships, and full participation in community life. It focuses on learning technical and professional skills. Students in all classes, except for their major specialization lab, attend for 4 hours a week sections of other specialties, in order to acquire more general technical skills, which will help on the one hand in their autonomous living and on the other in finding work, regardless of their specialty.

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Pedagogical climate and classroom management

With the promotion of inclusion and equal education as a key and after assessing the individual needs, skills, and interests of students with disabilities and developmental disorders, special education teachers draft and then implement Individualized Education Plans (IEPs).

a) First, we create a pleasant and family atmosphere, which is structured daily both verbally and with the behavior of each teacher, doing the lesson with enthusiasm and shaping the workplace appropriately (e.g. with pictures, with visualized rules, etc.).

b) We often encourage students to say verbally “Well done! You did very well” as well as non-verbally such as with a smile and/or a positive nod) or by placing a sticker on the reward board.

c) We provide immediate feedback to students, right when they are doing a task, so that they understand the connection between the task and their performance (e.g. "Very right, keep up the good work"), emphasizing mainly their effort. We also create motivation over time by awarding a 'student of the week' certificate award for both their behavior and their participation in the course, reinforcing active engagement and positive social behavior. It works very well, as the students stay focused on their goal, expecting the prize (positive reinforcement).

d) We encourage interpersonal communication, cooperation, and mutual trust by assigning group tasks, reminding the value of cooperation and the power of the group (daily during the lesson), and highlighting them on the classroom rules board (e.g. "We are all friends and we work together"). We use positive reinforcement by rewarding each child as a member of the "team of the week" with a certificate for their contribution to the class group and cooperation with their classmates, a practice that works proactively to avoid conflicts and is a motivation for cooperation and harmonious relationships between children.

e) We promote communication with them through active listening, always listening to them carefully, reflecting on their feelings, clarifying, formulating open questions, and using non-verbal communication elements (such as a smile, and a positive look-style).

f) We formulate clear rules of behavior both verbally and with the board that presents with a combination of images and phrases the rules of the class, also "signing" a contract of rules (with the participation of everyone) at the beginning of the year, emphasizing the relationships between them, the respect and unconditional acceptance. With the above practices, self-regulation of students' behavior is gradually promoted and conflicts between them are prevented. If a conflict arises, we always resolve it through dialogue. Also, if a child's behavior is not good, there is a warning with a yellow card. If he continues to misbehave, he gets the orange card and sits in the "thinking corner" to think about what he did wrong, to apologize, and to stop misbehaving. If nothing changes, he gets the red card, which means that the manager will be informed. If we do not have a positive development,

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the brown card is given and the child's parents or guardians are informed. Finally, we apply social stories to improve their social skills and understanding - following school rules.

g) We enhance the active participation of students in the learning process by adapting the lesson and the corresponding activities to their needs (e.g. strengthening social skills) and interests (to attract and maintain their attention). By discovering the interests and talents of students we structure their creative employment. We present the course content clearly and provide clarification as well as ongoing support.

h) We strengthen their self-esteem by encouraging them to take on tasks (depending on the lesson), offering them the possibility of choices, and using positive reinforcement (with an emphasis on effort). We also encourage students to participate in all school life activities (e.g. celebrations, events, school activity programs).

i) We practically express our trust in the students by assigning them responsibilities.

k) At the same time, we support the children psychologically by treating them with empathy and unconditional acceptance, with respect for diversity, building (day by day) a relationship in which we are a point of reference for them, making it clear that they can trust us and turn to us when they need something, have a problem, etc.

l) The teaching time is planned and organized with the corresponding activities. We assign specific roles to the children so that each one knows what work is called upon to carry out, thus contributing to their self-regulation, maintaining interest in the lesson, and preventing disorganization and/or possible tensions/conflicts (due to developmental disorders).

During the lesson, through reflection, the teaching may be redefined and adapted according to the needs that arise (e.g. participation motivation, conflict management, self-regulation, etc.) always based on the characteristics, needs and abilities of students. The main objective is the social, emotional, and cognitive development of the students while promoting their inclusion as equal members of society, independent living, and providing equal opportunities by organizing the necessary actions (e.g. using public transport, carrying out shopping transactions in grocery stores-bakeries, visits and transactions in workplaces and businesses, use of services such as the post office, joint actions with their peers from general education schools, etc.).

Methods/practices/techniques

We choose the following student-centered methods and practices, through a process of constantly searching for innovative approaches, applying them in the classroom, and having established that they contribute particularly to the social and learning development, as well as to the essential inclusion of children attending a special education school (E.E.E.K.):

a) Cognitive apprenticeship. since it is indicated mainly in the case of laboratories. According to the specific teaching approach, the students are initially presented with the work to be learned "directly" to serve as a model. Then, after creating a supportive learning environment, we encourage the children to practice in order to develop the specific taught skill. The achievement of the objectives requires the application of the specific method in a

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series of lessons, so that the children are trained "progressively" and eventually master the targeted skills.

b) Differentiated teaching methods and in this context personalized teaching. More specifically, the goals, methods, practices, and the entire learning process of said teaching (and every teaching without exception) have been formulated and selected respectively based on the particular capabilities, needs, difficulties, and, in general, the characteristics of each individual child.

c) Authentic learning. In accordance with this approach, we assign authentic projects, i.e. real tasks that children are asked to implement in their daily lives (personal hygiene, carrying out transactions, photocopying, etc.). This particular method significantly contributes both to the strengthening of the motivations that promote active participation in the course and to the promotion of independent living.

d) TEACHH approach. Based on this approach, we have created a structured educational program based on the organization of the classroom environment and the lesson activity program, the individualized work system, and the structured educational material, for children on the autism spectrum.

e) Task analysis: The teaching objective is broken down in a hierarchical order into small pieces –steps (task analysis). Each skill included in the teaching objective is taught separately thus constituting a step. Going step by step from the easiest to the most difficult, we reach the goal we set.

f) Kinesthetic - Multisensory method. This specific teaching method employs more than one sense, as the combination of various stimuli promotes both participation in the lesson and understanding of the cognitive subject being dealt with, with the help of new technologies.

g) Social stories. Social stories develop skills that help children (especially those on the autism spectrum) to understand social situations, follow rules, establish relationships with their peers, and develop functional behavior at school and in the respective social context.

h) Cooperative teaching which favors dialogue, cooperation, drawing up work plans, activating the student to investigate, and the discovery of knowledge through activities of observation, association, problem-solving, etc.

i) To prevent anger management problems, we use a variety of games that help develop a climate of trust, cooperation, and communication, some of which are the following:

- Strengthening the group through the experiential activity "Tie-loose".
- Establishment of rules/contract (making papyrus by the children) and signing it.
- Construction and exploitation of a board game related to team bonding.
- Experiential games:
 - a) "Guide for the blind" to promote trust and cooperation and
 - b) "Pantomime" to develop and/or improve communication skills.
 - c) "Thermometer of emotions" for the recognition-management of emotions.

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- "Beacon light" activity to develop conflict management-resolution skills and impulse control (e.g. anger).

Finally, it is worth noting the use of ICT, through which it has been found in practice that they improve the learning process, offer rich and varied stimuli (facilitating the application of both the multisensory method and the TEACHH approach), stimulate children's interest and alleviate the accessibility difficulties of special education students.

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Teaching materials

Real objects, photographs, signs, and paintings in the form of cards, traffic signs, and videos. The self-evident difficulty of people with mental retardation in understanding abstract concepts leads them to the need to refer to themselves as things and to support their thinking with them. Illustrated dictionaries offer important services in this direction. As well as three-dimensional objects. The visit to places related to the interdisciplinary unit being taught contributes to its preservation of knowledge through the multifaceted approach to the subject. The computer provides the ability to actively participate in the learning process since it allows building an environment based on the student's interests, delimited, with learning stimuli where important things can be taught connected to the "real world". Using his microphone computer in combination with special software encourages the involvement of the student in the learning process. Computer use with a course structured in separate small steps, starting from easy to difficult, from simple to complex, and from concretely in the abstract, creates pleasure in the student by guiding him in emotional readiness for learning. It reduces the competitive climate and helps with integration. It offers immediate support which facilitates the assimilation of knowledge. It ensures lifelong learning.

Series of textbooks and digital books are a reference point for students, and they make learning more organized by helping to make the daily activities at school predictable.

Every class has a computer and internet connection where the teacher can use software online adapted to students' needs and interests. There are tablets available to the student if the teacher deems it necessary. There are 4 Interactive Whiteboards and also specialized software different in each lesson.

Every workshop has its own equipment. We create educational material based on TEACCH method for students with autism and mental retardation. These materials include educational toys made from recycled items.

Also, we visualized tables, schedules, and rules to be understood by all students. We add in our equipment 3D printing- 3D scanner and 3D pens which make the course more attractive and more tangible.

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4.2. Case of the 2nd Primary School of Chios, Greece

3D printing is a big revolution in industry, but also in education. The programs designed are adapted to the needs and intrapersonal abilities of the students so that they use their imagination to the fullest. In addition, it helps students with special educational needs in learning more complex and complex concepts. They make the course more attractive, interesting, and understandable.

What is certain is that this technology is here to stay and we will encounter it more and more in all aspects of our daily life. It is an industry that will become established because it will be used more and more in almost all professions. Being able to introduce children to its use from an early age will be an advantage for their future educational and professional careers. More specifically, 3d printers and 3d technology (scanner, 3d pen, 3d applications)

- Help children get closer to many sciences (e.g. Math, Physics, Biology).
- They provide the possibility of better observation in the arts (e.g. sculpture, architecture, painting).
- They speed up the learning time since they illustrate the theory in the most illustrative way.
- They promote teamwork, which is required by teachers and students for a 3D design or object.
- They make the lesson enjoyable and creative, thus giving extra motivation to the children.
- They develop their judgment and observation. For example, to make the best design decision or to see the limits of the 3D printer in front of them, they observe well, dig deep, and finally decide.
- Children have a particular weakness for technology, especially when it has its way of impressing them. The fact that students can now touch on the concepts they hear in class, e.g. geometric shapes, is in itself an educational innovation. 3D printing and 3D objects, which will increase in our everyday life in the future, also have a pedagogical dimension.
- Children learn and get excited through a design they have made themselves and find a way to cultivate their flair and ingenuity by making a model.

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The importance of 3D printing for education lies in its ability to transform learning from a passive intake of information to an active process of creation. Here are some of the ways it does this:

1. Enables Hands-On Learning

By using 3D printing, concepts can become tangible models that students can engage with. Better comprehension and retention can result from this hands-on approach, which incorporates different learning styles.

2. Enhances Practical Understanding

By designing and printing objects, students apply theoretical knowledge to practical scenarios. For example, in science, students can print models of molecules to better understand their structures. In engineering, they can create prototype designs and see how they work in real life. This specificity ensures that students acquire practical skills and knowledge directly related to their fields of study.

3. It transforms theory into tangible objects

When students can touch and see the results of their work, concepts that are difficult to understand in abstract forms become tangible, closing the theory-practice gap.

4. Promotes engagement and interactivity

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The interactive aspect of 3D printing captivates students, encouraging a lively and enjoyable learning journey. It encourages active participation, ensuring that students remain motivated and deeply engaged in learning.

Taking into account all the benefits of 3D technology in relation to education, we implemented in our school (2nd Primary School of Chios) a personalized education program adapted to the learning needs of a student attending the Inclusion Department using the school's 3D pens and recorded the following Case Study, as well as its successful outcome.

Student Profile

Stelios is a student in the 5th grade of the 2nd Primary School of Chios and has been studying at our school since the 1st Primary. He was referred to KEDASY of Chios for evaluation when he was in 2nd grade. He was found to have severe learning difficulties and in particular Dysgraphia, severe Distracted Attention and Hyperactivity, as well as emotional difficulties. He has difficulty understanding complex instructions, but his perceptual ability is moving at an upper-normal level. Consequently, these difficulties affected all cognitive areas (reading, mathematics, comprehension, oral language, written development, and especially writing).

The student had difficulties in his social relations with the other children when he entered Primary School, but now he has joined his class very well and is accepted by the rest of his classmates. Attends Integration Department and supportive learning program, from 2nd Primary 5 hours a week.

Learning Objectives

- ✓ Cultivating his graphomotor skills
- ✓ Improving his self-esteem
- ✓ Cooperation with other children
- ✓ Rehabilitation of his learning difficulties

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- ✓ Correct pencil grip
- ✓ Improving the image of his written work
- ✓ Strengthening his attention and concentration for more time in the execution of a task
- ✓ To practice completing his tasks
- ✓ To control his mobility more.

Duration of the Program

- JANUARY- MAY
- 5 HOURS PER WEEK

As part of the course, he was attending at the Integration Department, when the student completed his tasks quickly and correctly, he was given a 3d pen and he could initially draw whatever he wanted along the way he filled in drawings and made specific outlines. This sort of thing had a degree of difficulty and as the program continued the student practiced something more complex.

Evaluation – Results

The student was excited about the idea of the 3D pen and developed motivation for the learning process. He also improved his handwriting skills according to the words of the general class teacher, with whom he worked closely. It was noticed that the student shows a special inclination and interest in technology and 3d tools, so it was decided to continue the program in the next school year in order to get in touch with 3D printing and scanning objects. The paradox was also observed, that the student can handle the pen better and more correctly than the pencil or pen when writing. The 3d pen was for him the most suitable tool in his hands. It was the occupational therapy tool to improve his abilities.

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Finally, through this process, Stelios experienced acceptance, and the joy of creation and developed a cooperative spirit, as well as other children from his class, as soon as they learned what he was making, they showed joy and strong interest in coming to the Integration Department and also perform those tasks with 3d pens. Thus, a variety of groups of different children with different abilities and educational needs were created and all together especially Stelios reaped the benefits of 3d printing in education.

The above case study is a case of successful educational intervention and is going to be expanded and continued in the next school year, both with the same student and with other children, and is a result of 3d technology and its introduction into Education.

Teacher for Special Needs: Kartali Anastasia

4.3. Case of ISA 13 of Sarzana, Italy

LUN



MATEMATICA

A crucial aspect of the work of the CTS is the monitoring and evaluation of the tools and teaching aids provided. The registration of these aids through the "Didactic tools and aids for disabilities" portal allows us to trace their use, state of conservation, and life cycle, thus promoting effective and informed management. This tracking system helps not only monitor the use of the tools but also plan their reuse, thus extending the benefits to an ever-increasing number of students.

The schools hosting the CTS receive annual allocations of financial resources, which are crucial for the purchase of aid and the implementation of projects. These funds are essential to ensure that schools can continue to provide adequate support and effectively respond to the needs of their students. The transparent and targeted management of these resources is fundamental for the success of the initiatives promoted by the CTS.



RICREAZIONE

The inclusion of students with disabilities in primary schools is a major challenge, but also an opportunity to promote equality and foster the development of all students. The following describes the context of a first-grade class in Primary School with 18 students, including a girl diagnosed with non-verbal autism spectrum disorder and a boy diagnosed with ADHD, oppositional defiant disorder, autism spectrum disorder, and high IQ. There are 5 teachers in the class: a teacher for literary subjects, a teacher for scientific subjects, a Catholic religion teacher, and two support teachers, one of whom is the teacher of the non-verbal girl with specialization.

Each of the two children with support also has an educator who follows them in educational activities when the support teacher is not present.

For the two children, two visual agendas were created to share with the class.



ITALIANO



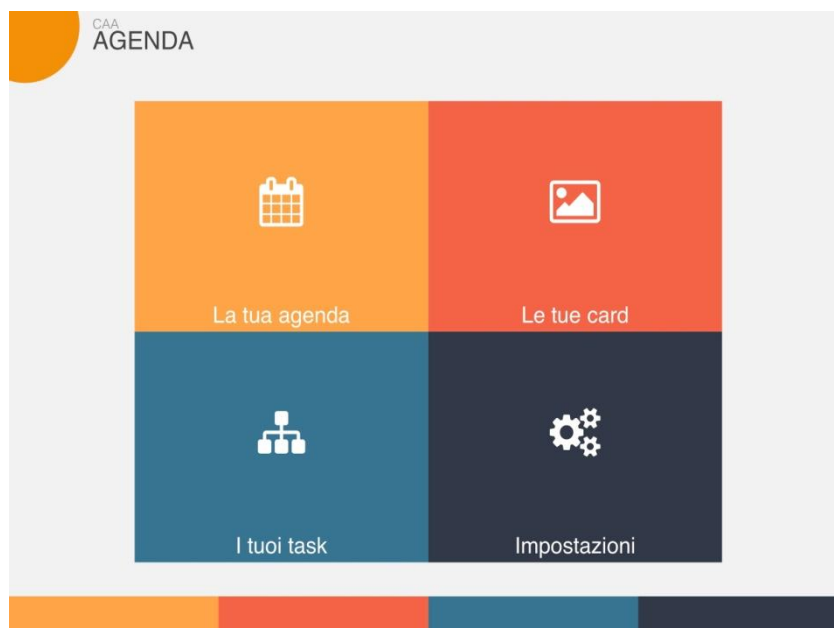
MENSA

For the boy, a visual agenda on paper was chosen. The agenda is filled out every morning by entering the subjects and teachers present during the day and as time passes the cards with the images are

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removed. The activities for him are structured in such a way as to have a request for attention of around 10 minutes interspersed with some moments of leisure or use of energy (anti-stress materials were also created with the 3D Printer). Given the child's need for moments of relaxation, a removable soft corner was structured in the classroom where the child could ask to lie down for the necessary time.

The girl has a digital agenda loaded on the tablet that also supports the communication app. Since the child does not use her voice to communicate, the tablet is a link between her and the others. The tablet was introduced recently and learning occurs with the help of classmates who prompt her with questions that she can answer with the images and sounds of the app. The digital agenda has a weekly scan, the child with the help of an adult or a companion examines all the moments of the activities and routines that accompany the arrival at school, the use of the bathroom, meal time, and the return home. The tablet also allows you to upload social stories that help the child in managing emotions and problem situations.

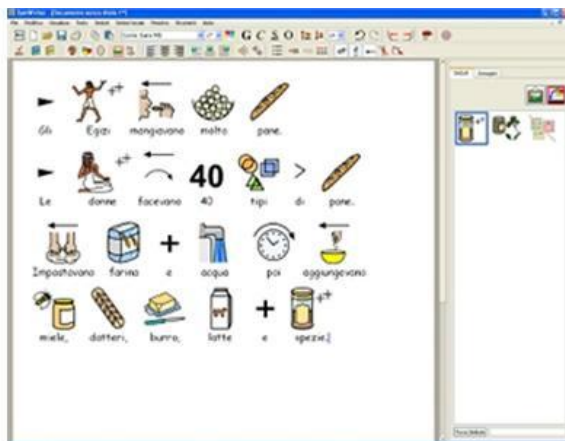


CAA Agenda app: example from one school day

SymWriter is a word processing program for writing texts with symbols for intuitive reading and for creating educational activities. Another very important and inclusive tool is the SymWriter software. SymWriter makes it possible to write texts by replacing them with symbols. The text with symbols can be created with a box including the symbol or without. You can use different symbols, already existing in the program, or insert new ones by personalizing them, for example, with a photo of a child. There is also a spell checker and a

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speech synthesis. SymWriter is based on two work tools, the Text Editor and the Environments, within which you can create grids of symbols, images, and words for multiple activities. Communication is fundamental for learning and for the active participation of students. The use of the AAC communicator and the SymWriter software are useful tools to encourage verbal and non-verbal communication. It was necessary to create opportunities for the practice and expression of language, both through structured activities and through everyday situations. Furthermore, involve the other students in communicating with the autistic classmate, encouraging them to use the AAC communicator and the SymWriter software as means of interaction.



SymWriter software



Let me Talk app Search ArasAAC app to find pictograms



Several texts of the class's teaching activities were rewritten with SymWriter and projected on the multimedia board, involving the whole class in reading. Sometimes the classmates were the voice of the child who read by holding the mark on the line and waiting for the classmate to reproduce the sound. To promote inclusion, it is important to create a school environment that welcomes and values diversity. It is important to ensure that the classroom is organized in a way that also encourages the active participation of children with special educational needs. For the non-verbal child, spaces dedicated to communication have been created and it has been ensured that the AAC communicator and the SymWriter software are easily accessible. In the use of AAC, classmates play an active role, and, more than teachers, they act as a stimulus for the child. Educating other students about alternative communication and providing them with the resources necessary to interact effectively with their autistic classmates is a winning strategy.

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The two children have an individualized educational plan, developed by a multidisciplinary team composed of teachers, school principal, parents, educators, and specialists (medical team).

The individualized plan, which takes into account the specific needs and objectives, is presented by November of each year after an initial observation period. There are three meetings per year, during which all the actors involved in drafting the individualized plan meet to evaluate the developments and any necessary adjustments.

The involvement of families is essential for achieving the objectives described in the individualized educational plan. A tool such as a tablet for communication is effective only when it finds space in the lives of those who use it. The purpose of using this tool is to lead the child to be autonomous, both in times of need and in times of interaction such as play.

4.4. Case of Kirkkomännikön Koulu, Finland

(oman koulun käytännöt 5-8s.)

Inclusion in our school

The idea of inclusion is based on a local school policy

All students go to the local schools in Tyrnävä

In our school, there are 6 special needs teachers and 2 special class teachers

Each grade has its own special education teacher. That is a very good resource (approximately 100 students/SNT).

We also have approximately 10 students who need advanced special support.

Local school policy: Local school policy means that a student goes to the nearest school and gets the support he/she needs. The idea is to bring the support as close to the student as possible.

It is important to determine the school where the resources of support meet the student's needs in the best possible way. This means that the student may also go to a study place other than the nearest school if their needs require so.

Student support

The student is always on his/her own stage of support (general support, intensified or special support) and it goes for all their studies in school.

The student can also get intensified or special support based on their behavior, interaction or other challenges although he/she doesn't have any learning disabilities.

The student doesn't have to have any diagnosis to get special needs education.

Multiprofessional cooperation includes collaboration with the school social worker, the school psychologist, and the school nurse.

Typical reasons for special needs education are reading and writing difficulties, mathematics difficulties, neurodevelopmental disorders, developmental language disorder, dyslexia/dyscalculia, ADHD/ADD, speech difficulties, and conduct disorders.

Pedagogical documentation

It is drawn up in collaboration with the class teacher, special education teachers, and guardian.

It is documented online on the WILMA system and is updated and evaluated at least once a year.

It is very important that all the information about the student is transferred through the documentation to the new teachers and all the forms of support are carefully written down on the document.

General support

General support belongs to everyone.

The following forms of support are used in general support: differentiation, collaborative teaching, remedial teaching (also proactive), guidance counseling, student welfare, part-time special needs education, different aids, assistant services, guidance, and support service.

A pedagogical document (a learning plan) can also be made for a student in general support if necessary.

Intensified support

If general support is insufficient, the level of support will be updated to intensified support.

Teachers draw up a pedagogical evaluation in collaboration with parents.

After that, **the learning plan** is made for the student. It defines in great detail the forms of support the student needs.

Practically, the means of general support are also used on the intensified level, but they are more planned, effective, and regular than in general support.

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In addition to that student can have the key-contents of a subject defined personally in their learning plan. The objective of defining key contents is to help a student manage the general goals of the subject.

Special support

If the intensified support is also found deficient, a multi-professional team draws up a pedagogical statement for the student.

An administrative decision is made based on a pedagogical statement.

The personal IEP (individual educational plan) is drawn up for the student.

The student is justified also for the full-time special needs teaching.

When needed, the subject goals can be individualized which means that the student studies the subject according to their own **specific objectives determined in the IEP**. The evaluation of the subject is also individual and follows the same goals.

All teachers

Classroom teachers take care of students getting general, intensified, or special support.

Classroom teachers and special needs teachers work together intensively on a daily basis.

The planning of support and pedagogical documentation are drawn up together.

A classroom teacher is responsible for the pedagogical documents of general and intensified support.

The forms of support are differentiation, remedial teaching (also proactive), structuring of lessons, etc.

Special needs teacher

Laaja-alainen erityisopettaja - A particular type of special needs teacher in the Finnish education system

A special needs teacher works with the whole age group and offers support for all the students whether they need general, intensified, or special support.

Special needs teachers do not have their own class or group and they work together with the classroom teacher in a class or teach their own group that is formed flexibly on demand.

Offers mainly part-time special needs teaching

Special class teacher

A special class teacher works mainly with the full-time special needs students.

In our school, two special needs classes include students from grades 1-6.

The students in our special needs classes get advanced special support. Students in those classes have a large variety of different special needs, and subject goals are heavily reduced and individualized to the point where some students rather study general skills (including motoric, cognitive, social, and communicative skills as well as everyday life skills) than specific school subjects.

The aim of this kind of teaching is to support, enhance and maintain the child’s development as a whole.

5. Comparison of three education systems

Similarities

According to the report of the European Agency for the Development of Special Education, the financing of special education is one of the most important factors that determine the success of inclusive education. The allocation of resources must follow an aligned and clear policy that has the following characteristics: a) funding from local organizations, where decentralization both in terms of decision-making and funding can be more effective and better respond to the needs of the local population, and b) flexibility of schools to use financial resources according to their own needs, within the framework of national policies (Watkins, 2003).

The common ground of the three education systems, the countries of Greece, Italy, and Finland, in accordance with what is provided by the relevant legislation, seems to be the integrated Education, the inclusion and equal access to education of students with disabilities and special educational needs (Meijer, Soriano, & Watkins, 2003). Special education teachers in all three countries work with the classroom teacher to provide appropriate support for students with disabilities and special educational needs. Additionally, schools should eliminate any barriers and provide all necessary accommodations (including the use of ICT) most suitably and functionally for each student's needs. Each state provides the education system free of charge. Also common to the three educational systems seems to be the support provided to students with disabilities and developmental disorders by special education teachers and other professionals such as psychologists, speech therapists, and occupational therapists (Brussino, 2020).

Differences

In Greece, in contrast to the systems of Italy and Finland, the possibility of attending special education schools is provided to students with disabilities and special educational needs. This happens in the event that the KEDASyS find that the attendance of the specific students in the integration classes is particularly difficult (Meijer et al., 2003). Special Education and Training in Greece is compulsory. It is an integral part of uniform public education and is provided free of charge. The state is obliged to provide Special Education and Training in Preschool, Primary and Secondary Education schools. The exclusive body of Special Education and Training is the Ministry of National Education and Religious Affairs (Ministry of National Education and Religious Affairs). The type and degree of special educational

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needs determine the form, type, and category of Special Education and Education school units (Greek Government Gazette A 199/2.10.2008).

More specifically, for primary education, there are: a) special Kindergartens and early intervention departments (within these Kindergartens), for students up to 7 years old and b) special education elementary schools.

In secondary education, there are: a) Lower secondary schools of special education, b) Schools of upper secondary education, c) special needs vocational lower - upper secondary education (ENEEGy-L), and d) special vocational education and training workshops (EEEEK) (Meijer et al., 2003).

In Greece, special educational programs are implemented in the Special Education and Education units and during co-education in general schools, depending on the disabilities and special educational needs of the students, for as long as necessary or for the entire duration of their school life. Systematic intervention programs such as occupational therapy, speech therapy, physiotherapy, and any other service that supports the equal treatment of students, evaluation, and pedagogical and psychological support, are primarily provided through the special education and training school units and additionally by the KEDASYs (Greek Government Gazette A 199/2.10.2008).

In addition, when the attendance of students with disabilities and/or special educational needs in schools of the general education system and inclusion classes is particularly difficult, the education of these students can be provided by:

1. Special education school units
2. Schools or classes operating either individually or as branches of other schools in hospitals, rehabilitation centers, youth training institutions, chronic disease institutes, or mental health unit rehabilitation education services (Meijer et al., 2003).

In Finland, students with disabilities and special educational needs are supported at three levels (general support, intensified support, and special support), in the event that they cannot achieve their learning goals through other support measures. The teachers who support the students with special needs draw up a pedagogical assessment together. Then, in collaboration with the students themselves and their parents, they draw up an individualized learning plan (Meijer et al., 2003). In Finland, the support system is more focused on identifying the need for support and its planning. The implementation should be based on a pedagogical assessment, which is supplemented with medical or psychological statements. In Greece, on the other hand, educational support planning still heavily relies on a diagnostic culture. (Honkasilta & Koutsoklenis, 2024). Differences in the provision of support inevitably arise when trying to meet each student's individual needs, especially when multidisciplinary collaboration involves people with various educational backgrounds.

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The form of support varies across different parts of Finland because education providers have the flexibility to determine how special educational support is organized. Intensive special educational needs students primarily study in special classes within special schools. However, the support needs of each student are individually assessed, and efforts are made to arrange support in a way that enables inclusion (Lintuvuori & Rämä, 2022; Ahtainen, Pulkkinen, Jahnukainen, 2021). The significance of funding and decisions on its allocation is reflected in the variations in implementation among different educational providers.

In Finland, funding for education is higher in relation to the Gross Domestic Product (GDP) than the average reported by the Organisation for Economic Co-operation and Development (OECD). Conversely, in Greece, education expenditure is below the same average. In Greece, for example, parents are also allowed to participate in the financing of special education by hiring someone to support their child in school. In this case, the responsibility for education and costs shifts from the state to the family of the disabled child. (Honkasilta & Koutsoklenis, 2024.) The amount of funding affects the possibilities for organizing special education.

The main difference between the Italian system and the Greek and Finnish ones is that all students with disabilities, including the most serious ones, attend mainstream schools. In Italy, a support teacher is assigned to the class in which there is at least one student with a disability. Parents are asked to provide the relevant documents specifying both the type of disability and the corresponding needs (Meijer et al., 2003). In case of diagnosis of disability, the Operational Working Groups (GLO) meet to address the specific problems of an individual student. These groups are made up of the school director, the class council that includes the teacher who supports the pupil with disabilities (support teacher), at least one other teacher of the same class, the pupil's parents, and the healthcare staff. Their main task is to draw up the Individualized Educational Plan (IEP) with methodologies and educational-didactic objectives calibrated on the specific student's potential and needs and verify its effectiveness in guaranteeing an educational path that favors the development of the potential of the pupil with disabilities.

Since December 2012, the law has provided for the possibility of personalizing teaching for students with SEN (specific learning disorders) through the adoption of compensatory and dispensatory measures and the creation of a Personalized Teaching Plan. This plan serves to define, monitor, and document the most suitable intervention strategies for teachers and to communicate the planned intervention strategies to families (Ianes & Cramerotti, 2013).

The schools were provided with operational tools for the educational inclusion of students with SEN including in this category non-certified SEN (socioeconomic, linguistic, and cultural disadvantages), and allows the activation of individualized and personalized paths for students who need them. In the absence of medical diagnoses, schools can refer to objective situations or reports from teachers or social services to identify students with SEN. Teachers

have the right to decide, independently, to draw up a personalized path for these specific types of students.

Opportunities

In today's multi-ethnic and multicultural society, the education system must train a citizenry that is supported by flexible, creative, and critical thinking capable of learning in both formal and informal environments. The use of information and communication technologies also promotes learning for those with special educational needs. Multimedia teaching, thanks to its "inclusive" potential, favors the affirmation of the concept of "different" which is no longer considered an obstacle, but a precious resource for the community.

In Italy the objective of inclusive teaching is to enable all pupils to achieve the highest possible level of learning and social participation, valorizing the differences present in the class group: all the differences, not just the most visible and marked ones of the pupil with a deficit or with a specific disorder.

Concerning the opportunities provided by the Greek education system in special education, it is possible to carry out a co-educational program and an effort has been launched to develop material in accordance with the principles of accessibility for people with disabilities and developmental disorders (Mavropalias & Anastasiou, 2016).

In Finland, the planning of support for education based on each student's needs allows for flexible modification and adjustment. The form of special education used is continuously monitored and changed to better meet the needs. Thanks to a multidisciplinary team, the monitoring is comprehensive and the support recipient is observed from various perspectives. The level and form of support are always aimed to be in line with the current needs of the support recipient, ensuring that learning with other students in the same group is maximized as much as possible.

The advantages offered by inclusive education for students with special educational processes refer to communication, cognitive, and social skills (Anderson et al., 2007). The implementation of inclusive education enhances the intellectual and social development of all students, with or without special needs. More social interactions with other children and social contacts are offered. Finally, inclusive education eliminates social discrimination and strengthens a climate of social solidarity, acceptance of diversity, and removal of prejudices (Soulis, 2002).

Challenges

Disability and all related issues continue to be central in the international debate and research on school inclusion. The main challenge is the realization of the right-to-school inclusion of pupils with disabilities at an international level, there are still many students who remain excluded from the access system to general education; In Europe, 1.55% of pupils, out of the total school population, attend special schools or classes with variable percentages, depending on the individual countries, ranging between 0.55% and 5.63% (European Agency for Special Needs and Education, 2020). These data demonstrate that the right to scholastic inclusion, affirmed by the Convention on the Rights of Persons with Disabilities (Art. 24, CRDP, UN, 2006) and ratified by the majority of states, is not yet fully applied (UN, 2016).

The process of inclusion of all students with disabilities and learning disorders has been underway in Italy for more than half a century now. In recent years this process has come to include students with cultural disadvantages. According to Salvatore Nocera, president of the Committee of Guarantors of the Italian Federation of overcoming handicaps (Fish), there are still open challenges, such as overcoming the gap between legislation and practice due partly to the insufficiency of financial means and partly to the lack of preparation regarding the inclusion of classroom teachers: it is, therefore, necessary to improve the preparation of all teaching staff according to the most recent and "inclusive" concept of inclusion. Furthermore, the number of support teachers is insufficient: six out of ten pupils change teachers every year due to job insecurity and these teachers are often not specialized: temporal continuity between the support teacher and the student is essential to achieve learning and integration objectives. Italy's goal is to guarantee high-quality scholastic and social inclusion.

As regards the Greek special education system in Greece, there are significant limitations in funding and, by extension, serious deficiencies in terms of infrastructure and appropriate equipment. Economic hardship also results in significant limitations on opportunities for training and further education of teachers regarding issues of special education and education (Kyriakopoulos, 2024).

Several teachers in Greece have limited knowledge of special education and are unable to understand the reasons why a child may have deviant behavior compared to the general population. This lack of knowledge is likely to lead to misunderstandings, incorrect ways of dealing with students, and failure to provide appropriate support (Gaines & Barnes, 2017).

Moreover, curriculum and teaching challenges in inclusive education refer to the difficulties that arise in designing and delivering educational strategies that respond to the diverse learning needs of children who need special education. These challenges can affect the quality and effectiveness of teaching, hindering educational progress and the inclusion of

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these students. Inclusive education requires individualized instruction that meets the unique learning profiles and needs of each student. However, designing and implementing personalized instruction can be challenging for educators because of the wide range of learning difficulties and educational strategies that are required. Therefore, they may struggle to balance the need for differentiation while ensuring that they follow the general curriculum (Tomlinson & Allan, 2000).

Also, it is pointed out that general education is not suitable for children with disabilities and special educational needs as it does not allow the individualization of teaching, which is necessary. It is argued that in the regular classroom, the student with a disability isn't usually provided with special individualized instruction, or special support from speech and occupational therapists, as in special schools (McCarty, 2006).

As far as Italy is concerned, given the inclusion system followed in recent years, with most students with disabilities attending mainstream schools and receiving individualized support, the full integration of students with very severe disabilities and developmental disorders is a significant challenge (Giangreco, Doyle, & Suter, 2012).

In Finland, challenges also include resources, their distribution, and varying practices among educational organizers. The formation of special education is influenced by the allocation of funding, teacher training, and the distribution of internal school resources. There is also a need for greater clarity regarding the interfaces between the levels of the three-tier support system. (Lintuvuori & Rämä, 2022) The significant autonomy of education providers also leads to the challenge that differences emerge in the implementation of reforms among stakeholders. Variations in teachers' training and understanding of practical implementation also affect the outcomes (Ahtiainen, Pulkkinen, Jahnukainen, 2021). There are shortages of teachers in special education and care (OECD, 2020). This is reflected in the disparities between education providers.

In all three countries, similar challenges can be observed: targeting funding effectively, the need for additional teacher training, and ensuring equitable provision of special education nationally.

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The integration of technology in general and special needs schools: The case of Greece, Italy and Finland

Preparation of WP2.2

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Erasmus+ Call: 2022 - KA220-SCH - Cooperation partnerships in school education

TASK 2/ TASK3 "The integration of technology in general and special needs schools: The case of Greece, Italy and Finland"
1. Introduction
2. European Digital Education Policy/Plan
3. National Digital Educational Strategies (strategies, differences primary/secondary, differences general and special schools 3.1. National digital educational strategy - GREECE 3.2. National digital educational strategy - ITALY 3.3. National digital educational strategy - FINLAND
4. Integration of technology 4.1 What is integration of technology 4.2 Who is responsible for the integration (teachers, parents, etc.) and how can it be achieved (software, equipment, application)
5. Conclusion

1. Introduction to Digital Education

For several years now the impact of Information Technology and digital technologies on all humanitarian activities has become evident. Our era is characterized, more and more often in public discourse, as the era of the Digital Revolution and the Knowledge Society.

The possibilities for citizens to access a vast and exponentially growing volume of information, the use of digital tools for communication, interaction and collaboration shape a special era, while the rapid development of computing and internet technologies and, above all, their diffusion to wider social groups have changed fundamentally the ways in which people are informed, entertained, communicated, collaborated, educated and engaged in the workplace (Κόμης, Εισαγωγή στις εκπαιδευτικές εφαρμογές των Τεχνολογιών της Πληροφορίας και των Επικοινωνιών, 2019), (Τζιμογιάννης, 2019)

Information and Communication Technologies (ICT) or Digital Technologies, as they are called recently, are a structural component of modern society and have decisively influenced every aspect of the citizen's daily life in the fields of administration, economy, education, culture, entertainment, etc.

The rapid development and spread of ICT, the enormous volume and multiplicity of digital information available today, combined with the rapid production of new knowledge, shape a new social, cultural, and educational environment.

It is now clear that ICT has found a variety of uses in the educational environment that are utilized. The educational research in this area highlights the specificity of digital technologies in the field of learning. Digital technologies are changing the fundamental features of the nature of knowledge, as well as how we access it (Τζιμογιάννης, 2019)

They are therefore treated as a tool with cognitive potential (Depover, C., Karsenti, T., & Komis, V., 2007), in the context of a large movement, which in recent years has led to the radical revision of the ultimate goals of educational policy.

At the same time, the excessively scholastic character of social acquisitions made the educational authorities realize that they urgently needed to favor the development of transversal skills, inextricably linked to reality, compared to the static knowledge that offer the traditional syllabuses. Thus, significant efforts were made to put into practice this change of perspective, with the ultimate goal of revising the curricula and modifying the pedagogical approaches so that they respond to the expectations of the new conditions.

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In this context of a global renaissance of the pedagogical approach, digital technologies seem to be able to contribute to the realization of the goals of the modern school, where what is important is not the knowledge of facts or principles, but the ability to recognize them with the help of an appropriate medium, or even the application of certain principles based on an appropriate technological base (Depover, Karsenti & Komis, 2007).

These technologies are now considered intrinsic components of the teaching and learning process, not as tools to support well-established educational practices but as tools based on which learning can be enhanced in a qualitatively different way. In particular, digital technologies are seen as tools that can support capacity-building of the 21st century (Dede, 2010), such as creativity, innovation, critical thinking, modeling, decision-making, and problem-solving.

In this context, ICT is a key tool for the transformation of the school, the support and reinforcement of learning, and finally, the upgrading of the educational result. New ICT environments are fundamentally changing the way people access, gather, organize, analyze, represent, and present information they communicate and cooperate with each other.

They shape and define new types of competencies (such as computational thinking, modeling, reflection, critical thinking, etc.) that the students must cultivate in the context of their basic studies so that they can use ICT effectively, creatively, and ethically.

At the same time, from the first decade of the 21st century, a significant change of perspective is visible in the various educational systems, which concerns the return to Program Informatics studies as a subject, already from the first school age.

Nowadays, the "informatics approach" is becoming a dominant trend again, i.e. the development of Curricula for ICT and Informatics (as a school science and not as a cognitive tool), with emphasis on the one hand on the development of Digital and Information Literacy, which concern the functional understanding and use of digital technologies by all citizens, and on the other hand the building of Computational Thinking, which is related to the ability to use of computer systems to solve everyday life problems.

Modern approaches to Study Programs now perceive digital technologies both as an object of new literacy (acquaintance with technologies, creative expression through technologies, understanding their place in society and culture), as well as cognitive tools with cross-functional uses (communication, collaboration, investigation, experimentation and discovery, problem-solving, creativity development, critical thinking) in all subjects.

Therefore, Informatics and ICT are included in the Study Program (PS) of the European countries aimed at enhancing learning, continuous student development, and preparation for their participation in the Society of Knowledge by cultivating life skills.

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Digital Literacy is one of the main directions of young people's Study Programs. By this term, we refer to the set of abilities (knowledge, skills, attitudes, and values) related to ICT and its uses. Digital Literacy is now an inherent part of the syllabi of all subjects, in most countries of the world, from the first stages of school. It covers the whole range of those abilities that students must possess and are related to the use of Digital Technologies for:

- a) The search, collection, evaluation, and management of information from various media and sources.
- b) Creating digital content and new information.
- c) Communicating and sharing information with others to build knowledge and solve problems (Κόμης, Εισαγωγή στις εκπαιδευτικές εφαρμογές των Τεχνολογιών της Πληροφορίας και των Επικοινωνιών, 2019), (Τζιμογιάννης, 2019).

In modern IT, a complementary concept to digital literacy is that of Computer Science Literacy or Computing Literacy), which is about building in-depth knowledge of basic IT concepts and how computing technology works in modern Programs

Digital and Information Literacy studies are now considered cognitive-learning subjects of equivalent importance to Linguistic Literacy, Mathematical Literacy, and Scientific Literacy. In fact, with a broad approach, Digital and Information Literacy are completed when they include in their problematic not only knowledge, understanding, and use skills of digital tools, but also the development of algorithmic thinking and programming skills which are key components of Computational Thinking (Wing, 2006).

In the light of this, the dimensions of Digital and Information Literacy do not include simply introducing students to digital technologies and an in-depth understanding of their operation but mainly concern the development of creative and expressive abilities with these technologies, which are an inherent part of the world in which children develop.

Creation and expression are considered high-level skills and combine both the use of digital tools for the production and transformation of digital material (texts, images, sounds, etc.) and the use of control and algorithmic approach technologies, such as robotics and programming. However, the construction of Computational Thinking, given the particularity it has in the Knowledge Society, must be treated separately, as an autonomous component of a modern ICT and Information Technology System.

Digital Literacy aims to build digital competence. Digital competence is one of the eight key competencies of Lifelong Learning, as defined by the European Parliament and the Council of the European Union (EE, 2006) 2006. According to the annex to this policy text, digital competence includes “the use of Information Society Technology (ICT) for work, entertainment, and communication, with confidence and critical thinking. It is supported by

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basic ICT skills: use of computers to retrieve, evaluate, store, produce, present, and exchange information and to communicate and participate in online cooperation networks' (<https://eur-lex.europa.eu/legal-content/EL/>).

Digital and Information Literacy includes all those educational activities in which students, with (or without) the support of the teacher, come into contact with, know, become familiar with, and understand functions of digital technologies and Information Technology as a science and at the same time understand their role in modern society and culture. As we mentioned above, this literacy cannot be fully cognitively completed if they only involve comprehension skills and use of computing tools but they do not fit into their problematic and the development of Computational Thinking ability.

Both the term and the concept of Computational Thinking in education were originally proposed by Papert, through his work on the educational approach to the language of Logo programming (Papert, 1980). With the term Computational Thinking, we mean that set of knowledge, skills, attitudes, and values related to solving problems using computational tools (data organization and analysis, systems design, debugging, modeling, optimization). The concept of Computational Thinking is, in essence, an extension of the concept of Algorithmic Thinking, known since the 1950s and 1960s in the area of educational informatics.

As Denning states, we can claim that Computational Thinking is an orientation of thinking based on which problems are formulated as transformations of inputs into outputs, and algorithms are sought to implement these transformations (Denning, 2009).

The term Computational Thinking came back to the fore with a related article by Jeanette Wing to 2006 (Wing, 2006). In this article, he states that Computational Thinking involves solving problems, designing systems, and understanding human behavior, with the fundamental concepts of Computer Science.

It also includes a variety of mental tools that reflect the breadth of the Computer Science field. Additionally, he argues that Computational Thinking represents a universally applicable attitude and set qualifications that everyone, not just IT scientists, should be willing to acquire and use. In other words, it is a high-level human ability that must be cultivated by the educational system.

As argued by (Yadav, A., Mayfield, C, Zhou, N., Hambrusch, S., & Korb, T., 2014), Computational Thinking belongs to the category of high-level human abilities with cross-cutting characteristics related to many aspects of life and is about solving problems using computational and critical thinking, rather than solely using a computer. Today, the scientific community recognizes that Computing Thinking is a multidimensional concept, which includes, as individual components, important concepts, methods, and practices that

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informatics scientists use to solve computational problems that arise in various scientific fields or everyday life (Φεσάκης, 2019).

As the American Association of Computer Science Teachers (CSTA) reports, Computational Thinking is a problem-solving methodology that extends the "domain" of computer science to all scientific fields by providing them with the means to analyze and develop solutions to computationally solvable problems. With its focus on abstraction, automation, and analysis, Computational Thinking is a building block of the wider discipline of Computer Science (<https://k12cs.org/>, 2016).

Nowadays, Computational Thinking emerges as a primary key skill for scientific and technological progress, since it concerns the application of Informatics concepts and methods as epistemological tools for solving computational science problems in fields of positive and social sciences, engineering, and arts (Denning, 2009). In the context of the formation of the new WS for the Primary School, we believe that Computational Thinking recommends a basic skill that all literate citizens must build during compulsory education.

This ability is so important that it must be considered equal to other basic skills such as reading, writing, and numeracy and should be developed in addition to them

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2. The Digital Education Plan in Europe

Introduction

In recent years, digital education has become increasingly central to the European educational landscape. The evolution of information and communication technologies has revolutionized the way we teach and learn, creating new opportunities and challenges for educators, students, and institutions. The Digital Education Plan in Europe represents a strategic response to these transformations, aiming to integrate digital technologies into educational processes and promote innovation in teaching.

Digital learning is not just an alternative to traditional teaching, but a fundamental dimension of modern education. It offers tools and methodologies that can improve student engagement, facilitate personalized learning, and make educational resources more accessible. In an increasingly interconnected global context, digital skills have become essential for the education of new generations, preparing students to face the challenges of the future.

This paper will analyze the historical and regulatory context that led to the adoption of the Digital Education Plan in Europe, examining the educational policies that influenced this initiative. Secondly, it will delve into the main elements of the Digital Education Action Plan 2021-2027, highlighting its purposes and the initiatives planned. Furthermore, it will explore the various tools and technologies that support digital education, as well as the importance of teacher training and inclusive practices.

This paper aims to discuss the challenges and opportunities related to the implementation of digital education in Europe, providing a critical vision of future prospects. This analysis is intended to contribute to an informed and constructive debate on the future of digital education in Europe, underlining the need for an integrated and collaborative approach to ensure the success of this transition.

Historical and Regulatory Context

Evolution of digital teaching in Europe

Digital education in Europe has evolved significantly over the past decades. In the 1990s, the introduction of computers in classrooms and the spread of the Internet began to transform the educational landscape. However, the integration of digital technologies into the teaching and learning process has occurred gradually, often limited by factors such as lack of teacher training, uneven access to technology, and cultural resistance.

With the advent of the new millennium, European educational institutions have started to recognize the importance of digital skills and educational innovation. Since the 2000s, numerous projects and initiatives have been launched to promote the use of digital technologies in teaching. In particular, the Erasmus+ Program has provided a framework for international cooperation and the exchange of good practices, promoting the mobility of students and teachers and the integration of technologies into curricula (European Commission/EACEA/Eurydice, 2019).

In recent years, the COVID-19 pandemic has further accelerated this evolution, forcing schools and universities to adopt distance learning solutions. This situation has highlighted the need for adequate digital infrastructures and technical skills on the part of both educators and students, making clear the importance of a strategic plan for digital teaching.

European educational policies

At the European level, educational policies have played a crucial role in promoting digital teaching. The European Union has developed a series of initiatives and programs to support educational innovation and the integration of digital technologies. Among these, the "European Digital Competence Framework" is a key document that outlines the skills needed for the effective use of digital technologies in Education.

Furthermore, the "European Union Skills Strategy" has highlighted the importance of digital skills as an integral part of lifelong learning and employability. European policies have also focused on reducing the digital divide by promoting equal access to technology for all students, regardless of their socio-economic background.

Another important aspect is the promotion of cooperation between Member States. Through initiatives such as the "Digital Education Action Plan", the European Union has encouraged the sharing of best practices and the development of national policies that support digital education. (Malizia, 2019).

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References to key documents

Several documents have marked the fundamental stages in the definition of educational policies related to digital teaching in Europe. Suffice it to say that digital competence has been included since 2006 among the key competencies for lifelong learning in the Recommendation of the European Parliament and the Council on key competencies for lifelong learning and that the 2018 Recommendation, always on the same topic, reaffirms its importance. The “Digital Agenda for Europe”, presented in 2010, outlined the objectives for the digitalization of education, promoting the use of digital technologies to improve the quality of education and learning.

More recently, in the “Digital Education Action Plan” (2021-2027), entitled “Rethinking education and training for the digital age” of 30 September 2020, the importance of the use of digital technologies not only for learning and teaching but also for the quality and inclusiveness of European education systems is highlighted, representing a decisive step towards the integration of digital technologies in education. This plan is structured around three main objectives: improving citizens' digital skills, improving education and training through the use of digital technologies, and ensuring an inclusive and accessible education system.

A far-reaching objective is undoubtedly the creation of a resilient European Education Area by 2025, which measures itself against major goals such as environmental sustainability, digital innovation, and social inclusion.

The historical and regulatory context of digital education in Europe is characterized by constant evolution and educational policies aimed at integrating technologies into education. The combination of European initiatives, strategic documents, and the impact of the pandemic has created fertile ground for significant change in education, laying the foundations for an innovative and inclusive educational future (European Commission, 2018).

Eurydice Notebooks: Study of Digital Education at School in Europe

The Eurydice network study, entitled "Digital Education at School in Europe" and published in 2019, offers much current food for thought, especially considering how interest in digital education has increased following the Covid-19 pandemic. The latter has forced pupils, students, teachers, school leaders, and families to face a significant challenge: organizing distance teaching and learning through the use of digital tools.

The reflection of the European Parliament and the EU institutions on access to the Internet as a fundamental human right is considered essential to promote social inclusion, reduce

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inequalities, and ensure equal learning opportunities for all, as well as to improve digital skills. The topics covered by the Eurydice study include the development of digital skills in European school curricula, specific digital skills for teachers, the assessment of students' digital skills, the use of technologies for testing and assessment, and current strategies and policies. These topics are analyzed from two complementary perspectives: the development of digital skills among pupils, students, teachers, and school leaders, and the pedagogical use of digital technologies to support, improve, and transform teaching and learning.

The study focuses on Primary, Lower, and Upper Secondary Education levels, with reference to the 2018/2019 school year, and analyses 43 education systems (28 EU Member States, including the United Kingdom at the time, and countries such as Albania, Bosnia and Herzegovina, Switzerland, Iceland, Liechtenstein, Montenegro, North Macedonia, Norway, Serbia and Turkey).

A particularly interesting aspect that emerged from the study, amplified by the pandemic, is the presence of ongoing reforms and strategies in European education systems, which reflect the continuous evolution of digital systems and technologies. This highlights the urgency for European countries to constantly review and update their approaches to digital content and methods in schools. Currently, 50% of European education systems are engaged in reform processes in the field of digital education. However, what are the areas of intervention of these strategies and reforms? In some countries, the reforms have arisen from the need to introduce digital content into curricula for the first time, where it was previously absent; in others, the aim has been to introduce digital competence at an earlier stage of education, as in the case of primary education, where it was already present in secondary education. Finally, some European education systems have sought to strengthen digital competence in curricula by introducing new approaches or strengthening specific areas, such as coding, computational thinking and cybersecurity (European Commission/EACEA/Eurydice, 2019).

Why do we need to act?

Digital transformation has had a significant impact on society and the economy, radically changing daily life. This has highlighted the need to develop higher digital capabilities in education and training systems. In addition, the COVID-19 pandemic has accelerated the transition to online and hybrid learning, leading teachers and students to discover new ways of teaching and studying online.

However, the adoption of digital technologies for education has also highlighted some challenges and inequalities. For example, there are disparities in access to digital technologies, with some people and communities not having access to computers or

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internet connections. There are also challenges related to teacher training and students' digital skills.

Some data highlight these issues. A 2018 OECD study showed that less than 40% of educators feel prepared to use digital technologies in teaching, with significant differences across EU countries. Furthermore, more than a third of 13- and 14-year-olds who participated in the ICILS study in 2018 did not have basic digital skills.

Inequalities in access to digital technologies are also evident in the lack of computers and internet connections in low-income households. According to Eurostat, in 2019 a quarter of low-income households did not have access to these tools.

However, the COVID-19 pandemic has been a turning point in the use of technology in education and training. According to a public consultation of the Digital Education Action Plan, 95% of respondents believe that the pandemic has been a turning point in the use of technology in these areas.

Faced with these challenges, a coordinated effort at the EU level is needed to address the issues highlighted during the pandemic and to ensure a strong future for digital education in Europe.

The Digital Education Action Plan

Description of the Digital Education Action Plan 2021-2027

The Digital Education Action Plan (2021-2027) is a renewed policy initiative of the European Union (EU) that aims to promote high-quality, inclusive, and accessible digital education in Europe. Adopted on 30 September 2020, the Action Plan seeks to address the challenges and opportunities of the COVID-19 pandemic and to support the adaptation of Member States' education and training systems to the digital age, highlighting the importance of effective and inclusive digital education. The Plan is part of the European Union's broader strategy for strengthening digital skills and creating a digital and sustainable Europe (Varotto, 2020). The Action Plan aims to promote European cooperation in digital education, involving teachers, students, policymakers, academia, and researchers at national, European, and international levels. The initiative is in line with the European Commission's priority "A Europe fit for the digital age" and with Next Generation EU. It also contributes to the Recovery and Resilience Facility, which aims to create a greener, more digital, and resilient European Union. The Digital Education Action Plan is a key element in achieving the objective of a European Education Area by 2025. It also contributes to the objectives of the

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Skills Agenda for Europe, the European Social Pillar Action Plan, and the 'Digital Compass 2030: The European Blueprint for the Digital Decade'. To ensure a well-focused proposal, the Commission organized a public consultation open from July to September 2020 to gather the views and experiences of citizens, institutions, and organizations.

The Action Plan is structured around three main areas: improving digital skills, effective use of digital technologies in teaching and learning, and inclusion and accessibility in digital learning. The policies and actions outlined in the Plan aim to ensure that all students, regardless of their background, have access to quality education supported by digital technologies (www.education.ec.europa.eu)

Strategic objectives

The Digital Education Action Plan has established several strategic objectives. One of these is the development of digital skills, which aims to promote the acquisition and enhancement of digital skills among students, teachers, and educational staff. This objective is essential to prepare new generations for an increasingly digital and interconnected world of work.

Another objective concerns the integration of technologies in teaching, intending to promote the effective use of digital technologies in teaching and learning. Innovative pedagogical practices and the adoption of open educational resources are encouraged.

Inclusion and accessibility constitute another objective, aimed at ensuring that digital education is accessible to all. This involves addressing educational inequalities and promoting inclusive practices, reducing the digital divide, and ensuring that students with special needs can benefit from the opportunities offered by digital teaching.

Finally, the Plan also includes support for governance and leadership, providing assistance to educational institutions and policymakers to develop effective strategies and policies that promote the digital transformation of education.

Planned initiatives and programs

The Digital Education Action Plan includes a series of initiatives and programs aimed at achieving specific strategic objectives. Among the main proposals is the continuous training of teachers, with professional training programs focused on digital skills and innovative teaching methodologies, developed in collaboration with educational institutions and training centers.

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Another important aspect is the strengthening of digital infrastructures in schools and universities, with crucial investments to ensure access to technologies. The Plan includes funding to improve connectivity and to equip institutions with adequate tools and resources.

Furthermore, the creation of cooperation networks between schools, universities, and other actors in the educational sector is encouraged, thus facilitating the exchange of good practices and resources. These networks will serve to support innovation and mutual learning.

The Plan also aims to promote the creation and sharing of open educational resources (OER), promoting access to quality teaching materials through the implementation of dedicated online platforms.

To ensure the effectiveness of policies and initiatives, a monitoring and evaluation system will be established, capable of providing useful data and information to guide future decisions and improve the implementation of strategies.

There will be awareness campaigns to promote awareness of the importance of digital skills and digital education, involving students, parents, and communities.

The Digital Education Action Plan 2021-2027 can be said to be a significant step towards the modernization of education systems in Europe, aiming to create an inclusive and innovative learning environment, capable of addressing future challenges and ensuring that all students have access to the opportunities offered by digital learning.

Actions of the Digital Education Action Plan

- The Digital Education Action Plan has defined two strategic priorities and fourteen actions to support these priorities. The European Commission is taking several measures to achieve the objective of promoting the development of a highly efficient digital education ecosystem. Some of the actions foreseen are:
- Action 1: The Commission is promoting a structured dialogue with Member States on digital education and skills to foster collaboration and exchange of best practices.
- Action 2: A Council Recommendation on key enabling factors for successful digital education and training will be issued. This Recommendation will provide guidance to Member States to develop effective policies and strategies in the field of digital education.
- Action 3: The Commission will also issue a Council Recommendation on blended learning approaches for high-quality and inclusive primary and secondary education. This Recommendation will promote the use of teaching methods that combine classroom and online learning.

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- Action 4: A European content framework for digital education will be developed. This framework will define the learning objectives and digital competencies that students should acquire during their education.
- Action 5: More resources will be provided to improve connectivity and digital equipment in education and training institutions. This will ensure that students and educators have access to high-quality digital tools and resources.
- Action 6: The Commission will issue ethical guidelines for educators on the use of artificial intelligence and data in teaching and learning. These guidelines will promote responsible and ethical use of digital technologies in education.
- Action 7: Common guidance will be provided for teachers and educators to promote digital literacy and counter disinformation through education and training. This guidance will provide practical tools and resources to help teachers develop their students' digital skills and address the challenges of online disinformation.
- Action 8: The European Digital Competence Framework will be updated to include AI and data skills. This will help ensure that students develop the skills needed to understand and use these emerging technologies responsibly.
- Action 9: The European Digital Skills Certificate (EDSC) will be introduced. This certificate will provide official recognition of the digital skills acquired by individuals, thus facilitating their mobility and access to job and learning opportunities across Europe.
- Action 10: A Council Recommendation will be issued to improve the provision of digital skills in education and training. This Recommendation will provide guidelines to Member States to improve digital education and training programs and ensure that the skills required by the labor market are adequately developed.
- Action 11: Transnational data collection on students' digital skills will be promoted and an EU-wide target for improving these skills will be set. This will allow for monitoring and evaluating progress in digital skills and identifying areas where further action is needed.
- Action 12: Internships called "Digital Opportunities" will be created to provide students with practical experience in the field of digital education. These internships will allow students to acquire skills and knowledge directly in the field, preparing them for the challenges of the digital world.
- Action 13: Initiatives will be promoted to increase the participation of women in STEM (Science, Technology, Engineering, Mathematics) disciplines. This will help reduce the gender gap in digital skills and promote greater gender inclusion in the technology sector.

Furthermore, a European Digital Education Hub is planned to be established. This hub will act as a center of excellence and coordination to promote digital education at the European level and facilitate the exchange of knowledge and best practices between Member States.

These actions illustrate the European Commission's commitment to promoting digital education and developing the skills needed to address the challenges of the digital world in Europe (www.education.ec.europa.eu).

European Digital Education Hub

To support both priority areas, the Commission will also establish a Digital Education Hub that will strengthen cooperation and exchanges on digital education at the EU level.

The European Digital Education Hub is an online community that brings together education enthusiasts from all over Europe.

The main objective of the Hub is to address the current fragmentation of digital education policies, research, and implementation practices at the European level. The Hub members seek to achieve this through:

- sharing good practices.
- mutual learning.
- cooperation between different sectors of education and training.

The Hub brings together a wide variety of professionals active in the digital education sector. The profiles present vary depending on the theme of the activity or mission. Among these there may be:

- teachers.
- teacher trainers.
- policymakers.
- representatives of educational institutions.

As a Hub member, you have the opportunity to:

- contribute to the evolution of digital education in Europe.
- receive support and mentorship from industry experts.
- speed up the development of your innovative solution.
- discover the latest educational trends and best practices.

Activity

Much of the Hub's work is done online via Microsoft Teams. Since the community includes members from all over Europe, work and communication is done in English.

Acceleration Program: Promoting Innovation in Digital Education

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Each year, the acceleration program selects and develops up to 12 prototypes from across Europe that foster digital development and transformation in the education sector. The chosen prototypes participate in an intensive 6-month training program, including mentorship, field testing, and the opportunity to present the results to the Digital Education Hub community.

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Selection process

Groups must consist of a minimum of 2 members. Candidates may include:

- educators
- researchers
- developers
- start-up
- EdTech (educational technology) providers
- other innovators

The selection committee evaluates the prototypes based on:

- Innovation
- Creativity
- Educational value
- Team composition
- Level of technology readiness (solutions must be advanced enough to be supported and field-tested after a few months)
- Motivation and interest in the program

Intensive online coaching and mentorship

Selected teams participate in intensive online coaching sessions three times a week. This structured approach includes regular check-ins and workshops. The goal is to provide comprehensive support, enabling teams to achieve their goals. The flexible program helps participants:

- challenging them to work on their goals and methodologies.
- keeping them focused through weekly meetings.
- making the teams' work visible in the Hub community.

The workshops offer teams the opportunity to interact with expert mentors and participate in other activities organized by the European Digital Education Hub.

The teams benefit from a network of mentors from all over Europe, composed of 10 experts from the education sector and 8 from the business sector. This mentoring support takes place in parallel with the online coaching sessions and includes individual calls and workshop sessions where the mentors share their expertise on specific topics.

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Test and presentation

A key aspect of the acceleration program is the testing of the selected prototypes and solutions in different contexts across Europe. Participants have the freedom to decide the locations and objectives of the tests.

At the end of the program, teams present their solutions at various industry events, such as international conferences and workshops. During these events, teams will interact with the public, gaining visibility for their solutions, receiving valuable feedback, and creating new connections for future collaborations.

Support in finding funding opportunities

The acceleration program does not provide direct funding for selected prototypes but offers support in finding suitable funding opportunities and developing financial plans.

Mentorship and Consulting

In the Digital Education Hub, you can receive guidance or mentorship from experts to address current challenges.

Offers

Online Clinics: One-Time Meetings Focused on Problem Solving

Mentorship Program: Expert Guidance to Achieve Your Goals in Digital Education

1) Online Clinics: Tackling Your Challenges Directly

During an online clinic, you can get expert advice on a specific challenge you are facing in digital education.

Guest experts can provide personalized guidance on topics such as:

- micro-credential
- design of hybrid, blended and online distance learning courses
- international collaboration and virtual mobility
- online evaluation
- diversity, inclusion and equity

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You can attend these meetings as an individual professional or with a team from your organization.

The next round of online clinics will begin in spring 2024.

2) Mentorship Program: Guiding Your Digital Journey

The program connects participants with high-level European experts in digital education. Mentorship is specifically designed around personal areas of interest, goals, or actions, ensuring a focused and impactful learning experience.

While you can participate individually, we encourage you to include colleagues from your organization, such as:

- members of the same course or program team
- teachers of the same group of students
- experts in teaching and learning support services
- leader of the institution

This collaborative approach ensures that mentorship sessions are not only personalized but also contextualized, maximizing benefits for both the individual and the institution.

Mentorship sessions will focus on your personal interests and the goals you want to pursue. Some examples include:

- Design of hybrid, blended, or online courses and curricula.
- Development of micro-credentials and microlearning in continuous training.
- Institutional Leadership for Digital Education.
- Digital Collaborative Teaching and Learning.
- E-assessment, collaborative courses or curricula, and digital mobility.
- Quality assurance and institutional policies/conditions for digital education.

The topic may concern all sectors of education and training, including primary or secondary education, higher education, vocational education and training, and adult learning.

The mentorship program consists of 3 two-hour sessions over 1.5 – 2 months.

Webinar for knowledge-building

Every month, the Digital Education Hub invites high-level experts to conduct webinars on topics related to digital education.

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These webinars are accessible to anyone interested and active in the digital education sector.

The interactive dimension of the webinars ensures that participants are actively involved in debates and discussions with the invited experts. This collaborative approach fosters community building, where different perspectives integrate to build a collective understanding of digital education.

Workshops and working groups

The European Digital Education Hub organizes community workshops three times a year in different European cities. These events provide a unique platform for community members to connect, share ideas, acquire new skills and methodologies, and collaborate on projects. Additionally, Hub members have the opportunity to participate in working groups (teams).

Types of workshops:

- Community workshops
- Design Thinking Workshop
- Collaborative Inquiry Sessions
- Working groups (teams)

Community Workshops

The Hub organizes workshops three times a year, bringing together 30 participants with diverse professional backgrounds from all over Europe. In collaboration with industry experts, participants spend 2 days discussing current topics that impact digital education. In 2023, the topics covered in the workshops included:

- digital skills
- artificial intelligence
- micro-credential
- digital education in times of crisis

These discussions aim to address contemporary challenges, share best practices, and discover innovative solutions in the ever-changing landscape of digital education.

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Design Thinking Workshop

Design Thinking Workshops are held every November and last two days. During these meetings, innovative ideas, educational frameworks, tools, and methodologies are generated, supporting a new approach to teaching and learning.

Collaborative Inquiry Sessions

Every month, the European Digital Education Hub offers a series of online activities open to all education professionals, including:

- teachers
- trainers
- school staff

These activities are based on the principles of collaborative inquiry methodology.

Short-term working groups

The Digital Education Hub establishes online working groups (or “teams”) on current topics in digital education.

Topics covered by the working groups include:

- lessons learned from COVID-19
- digital education in times of crisis
- interoperability
- micro-credential
- artificial intelligence in education
- digital skills
- sustainability and digital education
- diversity, equity, and inclusion

Each working group consists of approximately 20 participants, led by a subject matter expert. These groups operate for up to 6 months, with regular meetings in the Hub’s dedicated Microsoft Teams channels.

Solutions developed by working groups may include:

- policy recommendations
- guidelines
- teaching materials

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- courses

Who can participate

Educators, trainers, and professionals from all sectors and educational levels are invited to apply. Applicants must work in the field of digital education and demonstrate a strong interest in the specific topic of the working group. Presentations of successful interventions or strategies in the field are required, and participants are encouraged to disseminate the results of the working group in their professional fields. A minimum of one hour per week is required to dedicate to the working group activities, although greater involvement is greatly appreciated.

Long-term: Working Group on Interoperability in Higher Education

There is also a working-group specifically dedicated to interoperability in higher education (www.education.ec.europa.eu).

Technologies and Tools for Digital Teaching

Digital platforms and tools used in schools

In recent years, European schools have implemented a variety of digital platforms and tools to support teaching and learning. These tools not only facilitate access to educational content but also promote interaction between students and teachers, creating a more engaging and dynamic learning environment.

Learning management platforms (LMS), such as Moodle, Google Classroom, and Microsoft Teams, have become essential for digital teaching. These platforms allow teachers to share learning materials, assign assignments, manage assessments, and communicate with students efficiently. The availability of collaboration tools, such as video conferencing and chat, has enabled distance and hybrid learning, which is especially relevant during the COVID-19 pandemic.

In addition to LMSs, many schools use “content creation tools” such as Canva, Prezi, and Genially, which allow teachers to develop visually appealing and interactive presentations. Additionally, applications such as Quizlet and Kahoot! are highly regarded for their ability to make learning more fun and engaging, through interactive quizzes and educational games.

“Open educational resources (OER),” available through platforms such as OER Commons and OpenStax, provide educators with access to high-quality learning materials, enabling the personalization of instruction and the inclusion of diverse cultural and disciplinary perspectives. (Hattie, 2009)

Below are other digital tools used in schools:

- Education suites: G Suite for Education, and Office 365 Education, these suites offer tools such as email, shared documents, presentations, and virtual classrooms to facilitate collaboration between students and teachers.
- Distance learning platforms: Zoom, Microsoft Teams, and Google Meet, these platforms have become essential during the pandemic and continue to be used for online classes, group meetings, and presentations.
- Content Creation Tools: Canva, Genially, and BookCreator, these tools allow students to create presentations, infographics, digital books, and more in a creative and interactive way.
- Personalized Learning Platforms: Kahoot, Mentimeter, and Quizizz. These platforms offer quizzes, polls, and interactive games to make learning more fun and engaging.
- Classroom Management Platforms: ClassDojo, Schoology, and Edmodo. These platforms help teachers communicate with parents, assign assignments, track student progress, and more.

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Schools use digital tools for the following reasons:

- **Personalized Learning:** Digital tools enable teachers to create learning experiences tailored to each student.
- **Collaboration:** Students can collaborate on projects in real-time, even if they are in different locations.
- **Access to Information:** Students can access a wide range of online resources, such as videos, articles, and databases.
- **Motivation:** Digital tools make learning more fun and engaging, increasing student motivation.

In schools, the main challenges in using digital tools are the following:

- **Digital Divide:** Not all students have access to adequate devices and internet connections.
- **Teacher training:** Teachers need to be trained in the effective use of digital tools.
- **Distractions:** Digital tools can distract students from learning.

Digital tools offer numerous opportunities to improve learning in schools, but it is important to address the challenges to ensure effective and equitable use (www.economyup.it/innovazione).

Emerging Technologies

Emerging technologies are further transforming the digital learning landscape. Among them, artificial intelligence (AI) is one of the most promising innovations. AI can be used to personalize learning by analyzing student data and providing recommendations on materials and study paths suited to their individual needs. For example, platforms, such as DreamBox and Knewton use AI algorithms to adapt content and difficulty based on student performance, thus supporting personalized learning.

Another emerging technology is “augmented reality (AR)” and “virtual reality (VR),” which provide immersive and engaging experiences for students. These technologies allow for the exploration of complex content in innovative ways. For example, using VR headsets, students can visit historical sites or explore scientific environments, making learning more interactive and memorable. Applications such as Google Expeditions and Merge Cube are examples of how AR and VR can be integrated into the school curriculum.

Gamification, or the application of game elements in non-game contexts, is also gaining ground in digital teaching. Tools such as Classcraft and Minecraft: Education Edition use game mechanisms to motivate students and improve engagement, making learning more fun and challenging (Luckin, 2016).

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Other interesting emerging technologies are:

- Blockchain: This technology, the basis of cryptocurrencies, can be used to create secure and immutable digital records of educational credentials, making certificates more reliable and transparent.
- Internet of Things (IoT): IoT can be integrated into education to create interactive learning environments, for example through sensors that monitor the environment and adapt to students' needs.

These technologies have many advantages. Among them are the following:

- Personalized Learning: Each student can learn at their own pace and in their own style.
- Greater engagement: Immersive and interactive experiences make learning more fun and motivating.
- Access to Education: Digital technologies can break down geographical and social barriers, making education more accessible to all.
- New teaching models: Teachers can spend more time supporting students individually, rather than performing repetitive tasks.

The challenges that emerging technologies imply are:

- Cost: Implementing these technologies can be costly, especially for schools with limited resources.
- Digital divide: Not all students have access to adequate devices and internet connections.
- Privacy and Security: It is essential to ensure the privacy and security of student data.
- Teacher Training: Teachers need to be trained in the effective use of these technologies.

Emerging technologies offer enormous potential to improve teaching, but it is important to address the challenges to ensure their equitable and effective use.

(<https://dirittodiinternet.it/tecnemergenti>)

The importance of access to technologies

Despite advances in digital education, access to technology remains a key issue. Across Europe, there are significant disparities in access to digital tools and resources, which can negatively impact educational equity. Students from disadvantaged socio-economic backgrounds may struggle to access reliable devices and internet connections, limiting their learning opportunities.

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To address these challenges, it is essential that education policies promote investment in technological infrastructure and ensure equitable access to digital resources. This includes not only the provision of devices but also the training of teachers and students to use technologies effectively. Schools must become inclusive and accessible spaces, where all students can benefit from the opportunities offered by digital teaching. (Baker, Inventado, 2014)

Furthermore, it is essential to involve families and the community in the process of digitalizing education. Awareness campaigns and support programs can help reduce the digital divide and promote a culture of continuous learning, where all members of the community are motivated to develop their digital skills.

In conclusion, digital technologies and tools represent a precious resource for modern teaching, offering unique opportunities to improve teaching and learning. However, to realize the full potential of these technologies, it is essential to ensure equitable and inclusive access, addressing existing inequalities and promoting continuous training for all actors involved in the educational process. (Fadel, Lemke, 2008)

Teacher Training

Importance of continuing education for teachers

Continuous training for teachers is a key element to ensure quality education and address the challenges of digital education. In a rapidly evolving educational context, characterized by the integration of digital technologies and the emergence of new teaching methodologies, it is essential that teachers are constantly updated on best practices and available tools.

Continuous training not only improves teachers' pedagogical skills but also positively impacts student learning. Well-trained teachers are able to implement innovative teaching strategies that can engage and motivate students, promoting a more dynamic and interactive learning environment. Furthermore, continuous training helps teachers develop essential digital skills, which have become increasingly important in the era of digital teaching.

Another crucial aspect of continuing education is the ability to adapt. Teachers must be able to respond to the different needs of students and emerging challenges in the educational landscape. Continuous education allows educators to reflect on their practices, learn from shared experiences, and collaborate with colleagues to continuously improve their skills and methodologies. (Kimmons, Veletsianos, 2016)

Training and professional development programs

In Europe, several training and professional development programs have been implemented to support teachers in their professional growth. These programs can range from short training courses to long-term professional development paths and are often designed to address specific areas of expertise, such as the integration of digital technologies, educational inclusion or innovative teaching methodologies.

One of the most significant examples is the “Erasmus+” program, which offers mobility and training opportunities for teachers and educators. Through this program, teachers can participate in training courses abroad, exchange good practices, and collaborate with colleagues from other countries, enriching their professional experience and broadening their educational perspectives.

Additionally, many universities and educational institutions offer “continuing education courses,” workshops, and seminars for teachers. These events can cover a wide range of topics, from the use of digital technologies in the classroom to managing diversity and

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inclusion. Some courses are specifically designed to address emerging challenges, such as distance learning and the use of gamification in teaching.

“Communities of practice” and professional networks have become valuable tools to support continuing education. These networks allow teachers to share experiences, resources and strategies, contributing to their professional growth and to the improvement of education as a whole. (OECD, 2019)

Best practices in Europe

Best practices in teacher training in Europe offer effective models that can be replicated in other contexts. In some countries, such as Finland and the Netherlands, hybrid training models have been developed that combine face-to-face and online sessions. This approach allows teachers to learn flexibly and apply new skills immediately in their classrooms.

In Sweden, mentorship programs have been implemented in which experienced teachers support newcomers on their professional journey. This system not only facilitates the induction of new teachers but also promotes a culture of collaborative learning and knowledge sharing.

In Estonia and Denmark, some training programs focus specifically on integrating digital technologies into the curriculum. These courses provide teachers with the skills needed to use digital tools and online resources effectively, thus improving student learning.

In Germany, many federal states have adopted models of continuing professional development, which involve regular participation in training courses and workshops. These models are based on a feedback and reflection cycle, ensuring that teachers are constantly updated on best educational practices.

In some countries, such as the United Kingdom, schools have started collaborations to share resources and training practices. Through networks of schools, teachers can participate in seminars, workshops, and exchanges of experiences, promoting a collective approach to educational innovation.

As can be seen from the above, continuous teacher training is a crucial element for the success of digital teaching in Europe. Through well-designed training programs and the adoption of best practices, it is possible to ensure that teachers are equipped to face the challenges of the evolving educational landscape. Investing in teacher training not only improves the quality of education but also contributes to creating a more stimulating and inclusive learning environment for all students. (Gonzalez, Watanabe, 2020)

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Inclusion and Diversity in Digital Teaching

Challenges related to inclusion in digital education

Inclusion and diversity are key issues in digital education, as the implementation of digital technologies and tools must take into account the diverse needs of students. However, there are many challenges related to inclusion in digital education, which can hinder equitable access to educational opportunities for all.

One of the main challenges is the “digital divide,” which refers to the difference in access to digital technologies and resources among students from different socio-economic backgrounds. Students who do not have adequate devices or a reliable internet connection may face significant difficulties in actively participating in online learning activities. This gap is particularly acute in rural settings or in low-income households, where access to technology may be limited.

In addition, students’ “different abilities and special educational needs” can be another obstacle. Students with physical, cognitive, or learning disabilities may have difficulty using standardized digital tools, making it necessary to adopt personalized and inclusive solutions. The lack of adequate resources, such as accessibility software or adapted teaching materials, can further exacerbate inequalities.

Another significant challenge is “teacher training”. Many educators may not have the necessary skills to implement inclusive practices in digital teaching. Teachers must be trained to recognize and address the diverse needs of students, using teaching strategies that promote the active participation of all (UNESCO, 2013).

Initiatives to ensure access for all students

To address the challenges of inclusion in digital education, several initiatives have been launched at the European and national levels. These initiatives aim to ensure that all students can access quality education and that digital technologies are used equitably and inclusively. ICT, in fact, represents an opportunity for educators to personalize education according to the needs of students. But also, to develop essential digital skills and create dynamic and engaging learning environments, where creativity, collaboration, and critical thinking are promoted.

One of the main approaches is the “promotion of accessibility policies”. The European Union has developed guidelines and recommendations to ensure that educational technologies are designed taking into account the needs of all users, including those with disabilities. This

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involves adopting accessibility standards in digital platforms and creating educational resources that can be easily adapted.

Additionally, many countries have implemented “funding and support” programs to ensure access to technology for disadvantaged students. For example, initiatives that provide free or low-cost devices and technical support for low-income families can help reduce the digital divide and ensure that all students can actively participate in learning activities.

“Teacher training initiatives” are also essential. Training courses and workshops focused on inclusion and the use of technology to support students with diverse needs can improve educators’ skills and promote more inclusive teaching practices.

Examples of inclusive practices

Technologies offer valid and undisputed help in teaching students with disabilities or special educational needs: they allow for individualized teaching, tailored to experiences and objectives within a classroom context that does not marginalize the student.

Numerous examples of inclusive practices demonstrate how digital learning can be adapted to meet the needs of all students. These practices, while varying by context, share the common goal of promoting access and participation.

The adoption of assistive technologies, such as text-to-speech software, screen readers, and alternative input devices, can make it easier for students with disabilities to access digital content. These technologies help remove barriers, ensuring that everyone can interact with educational resources.

Additionally, teachers can develop teaching materials that are easily adaptable to the different needs of students. Using various formats, such as video, audio, and written texts, allows students to learn in the way that best suits their preferences and abilities.

Promoting collaborative learning activities, where students work together in mixed-age groups, is another way to foster inclusion. These activities not only encourage interaction between students with different abilities but also help create a more empathetic and supportive learning environment.

Providing personalized and timely feedback to students is essential to supporting their learning. Using digital tools that allow teachers to monitor progress and adapt activities based on the specific needs of students can greatly improve the learning experience.

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Finally, engaging families and the community in promoting inclusion is another effective practice. Organizing awareness and training events for parents and community members helps create a supportive environment for students, promoting a culture of inclusion.

Inclusion and diversity in digital education are critical to ensuring equitable and accessible education for all students. Addressing inclusion challenges requires a collective effort by educational institutions, teachers, and communities. Through targeted initiatives and inclusive practices, it is possible to create a learning environment that values differences and promotes the success of every student.

Evaluation and Monitoring

Methods for evaluating the effectiveness of digital teaching

Evaluating the effectiveness of digital teaching is a crucial process for understanding the impact of technologies on student learning. Different methods can be used to evaluate the effectiveness of digital teaching practices, each with its own advantages and limitations.

Formative assessment focuses on monitoring student progress throughout the learning process, rather than at the end. Through tools such as online quizzes, surveys, and continuous feedback, teachers can gather valuable data on skill development and adjust their teaching strategies in real-time. LMS platforms often offer built-in features to facilitate this assessment.

On the other hand, a summative assessment is conducted at the end of a teaching cycle to measure the level of learning achieved by students. Tools such as final exams, group projects, and presentations can be used to assess the skills acquired. It is important to design summative assessments to reflect the use of digital technologies and specific skills developed during the course.

Teachers can also use direct observation to evaluate the effectiveness of digital teaching. This method involves recording classroom interactions, student participation, and the use of technology during lessons. Observations can provide qualitative information about student engagement and the effectiveness of the teaching strategies used.

Digital platforms enable the collection and analysis of quantitative data regarding student performance. Through data analysis, educators can identify trends, strengths, and areas for improvement in the learning process. Predictive analytics, which uses algorithms to predict student outcomes, is an emerging area of interest in evaluating digital teaching. (Beetham, Sharpe, 2013)

Success indicators

To evaluate the effectiveness of digital teaching, it is essential to identify clear and measurable indicators of success. These indicators can vary based on the educational objectives and technologies used. A key indicator is student engagement, which can be measured through the level of participation and interest during teaching activities. For example, the number of accesses to online platforms, participation in virtual discussions, and interaction with teaching materials provide valuable information on engagement.

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Academic performance is another important indicator. Assessments, both formative and summative, can be used to measure academic results, and improvement over previous periods can signal the effectiveness of the digital approach.

Student satisfaction is another aspect to consider. Collecting feedback through surveys and questionnaires provides information on student satisfaction with the use of digital technologies in learning. The perception of the effectiveness of teaching materials and the ease of use of platforms are indicators that can help evaluate the success of digital teaching.

It is also essential to assess the level of digital skills acquired by students, as this helps to understand whether technologies are helping to prepare them for the modern world of work. Indicators such as the ability to use digital tools for research, collaboration, and presentation can be considered signs of success.

Finally, monitoring the access and participation of students with special needs is an important indicator of success. Ensuring the inclusion of all students in digital learning activities is essential to ensuring that digital learning is equitable and accessible.

Research and case studies

Numerous case studies and research have examined the effectiveness of digital teaching, providing empirical evidence on the benefits and challenges associated with the use of technology in education.

A study conducted in “Finland” examined the impact of integrating digital technologies in primary schools. The results showed a significant increase in student engagement and academic achievement, especially in STEM subjects (science, technology, engineering, and mathematics). Teachers reported increased student motivation and more effective use of digital resources.

In the “UK”, another study looked at the implementation of an online learning platform in a secondary school. Researchers observed that the use of the platform led to an improvement in student performance, especially among those with learning difficulties. Teachers also noted an increase in collaboration among students, thanks to the interactive features of the platform.

On the other hand, research conducted in “Italy” highlighted the challenges related to the implementation of digital teaching in less favorable contexts. In some schools, the digital divide has hindered students' access to technologies, highlighting the need for targeted policies to ensure equity in access to educational resources.

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A European-wide analysis has highlighted the importance of teacher training in assessing the effectiveness of digital teaching. Studies have shown that teachers who have received adequate training in digital technologies are more likely to use innovative tools in their pedagogical practices, leading to better outcomes for students.

In conclusion, evaluating and monitoring the effectiveness of digital teaching are essential to understanding how technologies influence learning and to continuously improve educational practices. Through appropriate evaluation methods, clear indicators of success, and evidence-based research, it is possible to create an effective and inclusive digital learning environment that meets the needs of all students. (Zheng, 2016)

Challenges and Opportunities

The main challenges in implementing digital teaching

The implementation of digital learning presents significant challenges that educational institutions must address to ensure effective and inclusive learning. One of the most pressing issues is the digital divide, which highlights the inequality in access to technology. Not all students have the opportunity to use appropriate devices and have a reliable internet connection, which can exclude some groups from online learning. This gap is particularly acute in disadvantaged socio-economic contexts, where technological resources are limited.

Another challenge is teacher training. Many educators have not received adequate training to effectively use digital technologies in teaching. This lack of skills can lead to ineffective use of technological tools and teaching that does not fully exploit the potential of technologies.

Resistance to change is another obstacle. Adopting new technologies can be met with reluctance from teachers and administrators, who may be reluctant to change established practices. This resistance may stem from fear of the unknown, lack of confidence in new technologies, or concerns about the additional workload that implementing digital tools may entail.

The sustainability of digital learning initiatives is another major challenge. Schools must ensure that technology resources are constantly updated and maintained and that there is adequate funding to support the long-term adoption of technology.

Finally, it is essential to consider the quality of the content. Not all digital teaching resources available online are of high quality, and teachers must be able to select appropriate and reliable materials. This requires critical skills and in-depth knowledge of the available resources.

Future Opportunities for Digital Education in Europe

Despite the challenges, there are numerous opportunities for digital education in Europe, which can help improve the learning experience for all students. Technological innovation is one such opportunity, as the continuous evolution of technologies offers new tools to improve teaching and learning. Emerging technologies such as artificial intelligence, augmented reality, and virtual reality can be integrated into teaching practices, creating more engaging and personalized learning experiences.

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Furthermore, collaboration and networking between schools and teachers from different countries are facilitated by digital platforms. Initiatives such as Erasmus+ and other educational exchange networks promote the sharing of good practices and resources, contributing to improving the quality of education across Europe.

Continuous teacher training represents a significant opportunity, as investing in teacher training not only improves skills but also helps create a culture of continuous learning within schools.

Digital technologies also enable personalized learning approaches, where students can progress at their own pace and needs. The use of adaptive learning platforms offers the possibility of better meeting the diverse needs of students, promoting inclusion.

Finally, global access to educational content via the Internet allows students to explore a wide range of resources, transcending the confines of traditional curriculum. This availability of materials can enrich learning and encourage student autonomy.

Reflections on the future of digital education

The future of digital education is promising but requires collective efforts to address current challenges and maximize opportunities. It is crucial that European education policies continue to promote innovation and sustainability in digital education while ensuring that all students have equitable access to resources.

Furthermore, inclusion must remain at the center of the educational agenda. It is essential to develop strategies that ensure that no student is excluded from digital learning, addressing the digital divide and promoting the accessibility of technologies.

Teacher training will be crucial to the success of digital education. Investing in educators' digital skills will not only improve the quality of teaching, but will also help create a more cohesive and collaborative educational community.

Finally, educational institutions need to work with families and communities to support digital learning. Creating a learning culture that involves all stakeholders in the educational process can lead to better outcomes and a more stimulating learning environment. Engaging and supporting parents in digital education represents an opportunity to develop students' digital skills for many reasons. PISA 2012 data (OECD, 2016b) shows that young people spend more time on extracurricular Internet activities than in school, which means that parents have an important role to play in encouraging their children to become critical and aware users of technology. A qualitative survey of young children and digital technologies found that parents would welcome advice on promoting children's online safety. 'Advice

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from schools appeared to be limited, nor did there appear to be substantial communication between schools and families on technology-related issues' (Chaudron, 2015, p. 9). The second school survey on ICT in schools found that the younger the child, the more frequently parents share their ICT activities. However, a large proportion of secondary students never or almost never discuss the risks of the Internet with their parents. Furthermore, more than half of secondary students never or almost never get support from their parents or siblings for homework that requires the use of ICT (European Commission 2019, pp. 89, 96). In addition, just as teachers' attitudes towards and ability to use digital technology are critical factors in how they deliver digital education to their students, parents' attitudes and abilities will also be crucial in helping or hindering their children's development of digital skills. Only a few countries provide examples of policy measures in this area, which are rarely among the key objectives of their digital education strategies. Practical support for parents can, for example, be provided through explanatory materials as is the case in France, where a practical guide for parents on the use of digital technologies has been developed. Other countries organize training courses for parents or awareness and prevention campaigns, often linked to the area of safety.

In the **Flemish Community of Belgium**, the 'Safe Online' program (145) aims to encourage parental involvement and train parents. Funded by the Department of Education, it has reached hundreds of schools and thousands of parents since its inception in 2012. Each school year, at least 150 school sessions are organized across the region to inform and train parents and/or boards on online safety in five thematic areas: sexuality and relationships in the online world, cyberbullying, online privacy, social media, and gaming. In **Cyprus**, the Pedagogical Institute organizes workshops for parents on digital education issues, particularly on internet safety. In **Malta**, the Directorate for Digital Literacy and Transversal Skills, within the Ministry of Education and Employment, is implementing awareness-raising initiatives for parents, including information sessions involving them in initiatives such as One Tablet Per Child, Family Coding, and Digital Literacy Week. In **Poland**, measures to develop parents' digital skills and engagement in digital education cover two key areas: promoting online safety and risk prevention, and involving parents in activities that help develop children's digital literacy, including programming. The measures include, for example, the Safe+ program, a government program coordinated by the Ministry of Education. Another example is the projects and programs for parents implemented by the NASK - National Research Institute: the 'Become a friend of your child' program, which offers webinars on children's and young people's safety on the Internet, as well as other brochures and guides. In **Slovenia**, the Action Plan for ICT in Education (2006) stipulates that future digitalization activities should also involve parents. The objectives include training and promoting ICT applications in the life and learning activities of parents and other stakeholders. Furthermore, parents and other ICT users should in the future be able to obtain information on new skills as well as relevant training in seminars and other activities related to extracurricular education. Liechtenstein **also** offers various activities such as prevention campaigns, exercises, and training for parents and other stakeholders. Some

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important issues addressed are, for example, data privacy issues, sexting, and mobbing via social media.

Digital education can, of course, be one of the issues on which schools inform or consult parents (or at least their representatives) as part of regular communication procedures or through the school governing body. Furthermore, digitalization in schools can improve the flow of information between schools and parents, strengthening the school's consultation and participation processes and helping parents to become familiar with digital issues and the benefits offered by technology. For example: In **Italy**, there is a national digital strategy action aimed at improving communication between schools and families through a digital portal where student results and other data are stored, and through which communication flows are simplified. Furthermore, through the school's digital coordinator, families will be involved in specific training sessions to become familiar with topics related to digitalization. Similarly, the **United Kingdom (Scotland)** is looking for opportunities to use digital technology to interact with parents and guardians, enabling them to understand the benefits of digital technology in education. This can be done by involving parent councils and parent/carer groups in discussions about the use of digital technology to help enable learning to happen anytime, anywhere.

It can be said that the future of digital education in Europe is full of potential. By addressing current challenges and capitalizing on emerging opportunities, it is possible to build a more equitable, inclusive, and innovative education system, capable of preparing students for the challenges of the modern world. (Selwyn, 2016)

Conclusions

Summary of key points

In the course of this work, we explored the evolution of digital teaching and its impact on contemporary education. We analyzed the technologies and tools that have transformed learning environments, highlighting the importance of continuous training for teachers and the challenges related to inclusion and diversity. Furthermore, we discussed methods of evaluating the effectiveness of digital teaching and indicators of success, as well as future opportunities for digital education in Europe.

The main challenges that emerged included the digital divide, the need for adequate training for teachers, resistance to change, and the sustainability of digital teaching initiatives. However, we also identified numerous opportunities, such as technological innovation, the possibility of personalizing learning, and global access to educational resources that can enrich the learning experience.

Furthermore, it has become clear that inclusion and diversity must remain at the heart of educational practices, ensuring that all students have equal access to the resources and opportunities offered by digital learning. Evidence gathered through research and case studies has shown that, if implemented correctly, digital technologies can significantly improve educational outcomes and student engagement.

Reflections on the Importance of Digital Teaching

Reflecting on the importance of digital teaching, it is clear that it represents a unique opportunity to revolutionize traditional education. The possibility of integrating advanced technologies into pedagogical practices not only makes learning more engaging and interactive but also offers students the opportunity to develop fundamental skills for the future, such as critical thinking, collaboration, and digital competence.

Digital learning has the potential to democratize access to education, overcoming geographical and socio-economic barriers. However, it is crucial that this potential is realized through inclusive policies and strategies that ensure that no student is left behind. In this context, the role of teachers is crucial; they must be supported and trained to use digital technologies effectively and to create welcoming and stimulating learning environments.

Recommendations for the future

Looking ahead, it is important to consider some key recommendations to further improve digital teaching. Investing in teacher training is crucial, as there is a need to develop continuous training programs that provide educators with the skills needed to effectively integrate digital technologies into their teaching. Educational institutions should collaborate with industry experts to ensure that training is current and relevant.

Promoting equitable access is another priority; education policies must address the digital divide by investing in technological infrastructure and resources to ensure that all students, regardless of their socioeconomic background, can access the technologies needed for their learning.

It is also essential to develop high-quality educational content. The digital resources available should be of high quality and easily accessible, so institutions should encourage the creation and sharing of Open Educational Resources (OER) that can be used by teachers and students across Europe.

Encouraging collaboration between schools is a further step forward. Creating collaborative networks between schools and teachers can facilitate the exchange of good practices and resources, improving the overall quality of digital education. Online learning platforms and networking events can facilitate this exchange.

Finally, it is essential to constantly monitor and evaluate the effectiveness of digital teaching practices. Institutions must establish monitoring and evaluation systems that allow them to collect data on student performance and the effectiveness of these practices. This information can be used to continuously improve educational strategies and ensure that learning objectives are achieved.

In conclusion, digital learning represents an exciting frontier for education, offering unprecedented opportunities to improve learning and inclusion. It is crucial to address existing challenges and promote practices that ensure equitable and quality education for all. With collective commitment and a shared vision, we can build an educational future where digital learning becomes a catalyst for positive change and empowerment of students across Europe. (European Commission, 2018).

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Sitography

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- <https://dirittodiinternet.it/tecnemergenti/>

3. National Digital Educational Strategies

3.1. The Case of Greece

The Purpose of the Integrated Strategy for Digital Education is to assist the educational project and the upgrading of the level of digital readiness of schools, through the further integration of Technologies of Information and Communications in Primary and Secondary Education, as well as the strengthening of structures and their quality.

It concerns the following axes:

- Infrastructure and services
- Software
- Content
- Teacher training
- Educational community support

Infrastructure and Services

Supply of IT labs and laboratories of Open Technologies and Innovation so as to:

- create a different school workshop that concerns everyone, both primary and secondary education teachers.
- record the digital infrastructure of the schools and their activities.
- ask teachers to record their digital material needs.
- ask teachers to describe how they will utilize the new material.
- Write specifications for digital hardware Upgrading the schools' network access to the new generation.
- broadband using optical fibers.
- Upgrade central computing, storage, and networks.
- Improve the infrastructure of the Panhellenic School Network for the continuation and expansion of the services it offers throughout the education community.

Software

- Upgrade the LTSP model and 'Supervisors' to support the latest version of Ubuntu (16.04)
- Implementation in over 1000 school laboratories IT resulting in savings at least 7 to 9 million euros from the use of this software.
- Creation of a library of educational software or freeware with what's already available on the Internet.

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- Development of educational software for teaching courses where required, categorized by subject of teaching and general use.

Content

- Change the Study Programs in collaboration with the Institute of Educational Policy, for the inclusion of Open Technologies and Innovation (e.g. Educational Robotics) in all subjects and not only in Informatics courses.
- Use of educational software in class, which has additional benefits for students as it will bring about essential innovations:
 - I. in the means of teaching (open technologies of robotics, engineering, new approaches to the workstation concept, open educational content, etc.)
 - II. in the teaching process, while it will help to develop students' critical thinking, changing the teaching practice, the learning process, and the communication Digital Educational Content "Photodentro".
(<http://photodentro.edu.gr/aggregator/>)
 - III. Digital educational content is a key pillar for the integration and constructive utilization of ICT in Primary and Secondary education.

The "Photo-tree" is a Digital Educational Content that maximizes the possibilities of constructive utilization, integration, and reuse of digital content in the learning process. The "Photodentro" is an Educational Material Repository From many different sources that allows searching for open digital content for school training from a central point. The collection of all educational material in one and only one repository go.minedu.gov.gr is under the responsibility of the IEP. It is about:

- open learning objects.
- educational videos.
- educational activities.
- development of new Open Educational Resources (OERs) and active participation of the educational community.
- the operation, expansion, and improvement of the digital Repositories "Photo tree" for organization, effective search, and wide availability of educational resources in the school community, and the wide operation of the corresponding central Accumulation Service.
- Today many agencies continue to produce material that is found scattered in various repositories in which the access cannot be easy for the teacher and the student.
- Updating the existing website, is essential to improve the collection of all educational resources to be produced.
- Reinforcement of IT courses by adapting the curricula at all levels of education.

The main axes, on which the upgrade to the creative use of new technologies is based, are summarized below:

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- Computational thinking/critical problem-solving ability
- Troubleshooting/coding
- Distance education and distance learning
- Open educational environments
- State Certificate in Computer Science - It is suggested to have preparation courses in schools after the end of the schedule in High Schools aimed at the students and since they attend these courses, take the exams.
- Teaching the use of the Operating System for computers “Office” and the Internet use during teaching hours and not in IT courses.
- Integration of educational robotics in all grades and education levels

Educational robotics is an activity that allows the student to engage in a process that is:

- educational
- entertaining
- creative

Students have the opportunity to familiarize themselves with the concepts of Sciences (STEM), as expanded by the addition of informatics (STEMI – Informatics) and other cognitive objects (such as History etc.). Educational robotics supports every student, not only cognitively but also emotionally, enhancing:

- self-esteem.
- self-confidence and sociability due to participation in group activities and active contribution to the learning process.

Teacher training

- The continuation of B-level training for the utilization of ICT in the teaching of cognitive subjects.
- Permanent remote training mechanism.
- Creation of a Permanent Training Mechanism for the Ministry of Education, which will involve all the agencies.
- Implementation of this action (Universities, executives of education, administrative structures, etc.). The mechanism will operate permanently.

The goals of the mechanism are:

- the training of all teachers in any subject required.
- the involvement of the executives in the training they carry out training so that the training is permanent wherever and when needed.

Educational Support Model

Distance education models Utilization of modern tele-education media using different training models depending on the subject

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Model A: Distance education using Moodle and BigBlueButton
Model B: Distance education using Moodle and VirtualMachines
Model C: Distance education using Moodle and OpenSim
Model D: Massive Open Online Courses (MOOCs)
Model E: Lab 2 Lab Worlds

Educational Community Support

The "New Technologies and Innovation" department in the Ministry of Education supports the new PEKES (Regional Educational Planning Centers) and KEDASY (Center for Interdisciplinary Assessment, Counseling, and Support) structures with teachers to promote ICT in Education.

It also offers strengthening of the KE.PLI.NET.T. (Center for Interdisciplinary Assessment, Counseling and Support) with extra staff and technical infrastructure given the important multiple role in the diffusion and support of integration of Open Technologies and Innovation in School Units And teachers highlighting and disseminating good practices such as

- Competitions
- Festival of innovation and creativity

The action concerns the organization of a festival for the exhibition and award of school programs, partnerships, and actions in the fields of sciences using digital technologies, according to National standards (Panhellenic robotics competition, etc.) but also international events (makerfaire Europe, white house maker faire, etc.).

Strengthening of European Programs such as eTwinning

- eTwinning (www.etwinning.net) is a European action for schools from different European countries, using Information and Communication Technologies (ICT) tools, to work together to achieve pedagogical, social, and cultural benefits.
- eTwinning in Greece is the most popular program for teachers and students. (The Greek e-twinners community already numbers 18000 teachers)

Synergies

In order to achieve economies of scale and ensure the sustainability of the results that will arise from the implementation of the actions as part of the Integrated Strategy for Digital Education, it is of major importance the establishment of synergies between supervised bodies of the Ministry of Education with high scientific and technological competence, such as:

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- the National Research and Technology Network.
- the Diofantos ITU.

Implementation in Primary School

In Greece, the philosophy of the Unified Curriculum Framework for Informatics is adopted, from preschool education to high school. The new Curriculum registers as a continuation of the previous Informatics and ICT Study Programs of the Greek school, integrating the timeless elements (referring to the fundamental, important, and unchanged Thematic Fields of reference science) and good practices in combination with the new trends and the international experience.

At the same time, the new curriculum follows a series of specialized principles, intending to constitute the basis for the education of the future citizens of our country for at least the next decade (Κόμης, Β., Καπανιάρης, Α., Κουτρομάνος, Γ., Λιακοπούλου, Ε., Παπαδάκης, Σ., Σκιαδέλλη, Μ., & Τσιωτάκης, Π., 2022).

Inclusion – widening participation

The curriculum aims to reframe stereotypes, such as that training in Informatics, as a general education course, concerns only specialist categories of students with an inclination towards positive and technological sciences, is mainly interested in boys, or is limited to familiarizing students with the use of software and the internet. Instead, it aims to encourage all students to explore the scientific field of Informatics by providing a realistic framework that will benefit them to actively participate in learning. All students, regardless of gender, ethnicity, socio-economic factors, special needs, or any other demographic characteristic, will have the opportunity to actively participate in Information Science issues and digital technologies so that they are able to understand the value, impact, and importance of IT education.

Education with tolerance for diversity and respect for other cultures

Students understand that IT and the Internet constitute an international framework for social interaction and cooperation. Students will be able to participate in the global internet culture by combining it with their identity and projecting their cultural heritage, while at the same time understanding diversity and the existence of other ethnic groups and people.

Connecting the lesson to the real world and everyday life

The students study how Information Technology affects everyday life by helping to solve everyday problems with innovative applications. In addition, they gradually perceive through the specific course that they can become capable of creating such solutions and be enhanced by IT knowledge to shape the world in which they live. Students know or create applications that communicate with the natural environment and control systems in it

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through appropriate technology control. At the same time, they use digital technologies as a means of creative expression, entertainment, and art.

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Pedagogical flexibility – Openness

The PS adopts the principles of modern pedagogy and of science teaching and promotes an open philosophy of education in Informatics Which can be adapted appropriately based on particular local and cultural contexts. Furthermore, it is independent of specific technologies, tools, and platforms, while taking into account that digital technologies are emerging and constantly evolving. For example, the course will be able to be taught effectively both in the computer lab and in the classroom, with various technological means and infrastructures.

Investigation and collaboration

In all classes of Primary School, the students will have the opportunity, using appropriate real-world problems, to use computational tools as a means to explore, collaborate, solve problems, enhance their individual development, and promote the lifelong culture of learning. The ultimate goal is to build a culture of cooperation as members of teams undertaking a common project, setting common goals, arguing and sharing ideas, providing constructive feedback to each other, and creating.

Interdisciplinarity

Informatics has evolved into an autonomous scientific field, which is developing at an exponential rate. However, many concepts and ways of thinking have common elements with other fields of knowledge, such as Natural Sciences, Mathematics, and Social Sciences. The curriculum of Informatics emphasizes these connections and encourages teachers to adopt interdisciplinary practices and integrate IT into other disciplines supporting, supplementing, extending, and completing the students' learning.

Scientific research – Didactic

The curriculum incorporates successful models of teaching Informatics from other educational systems. In addition, it is based on the current scientific research concerning the education and Didactics of Information Technology.

Teacher support

The implementation of the ICT and Informatics Curriculum takes into account the educational needs of teachers of the practice, who are called to plan and support open and multi-level teaching approaches, which are focused on the learning needs and the developmental course of the students.

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Balance of Digital and Information Literacy

Information Technology in Primary Schools should harmoniously combine the development of Digital Literacy (creative ability use of Digital Technology or Information and Communication Technologies) with training in elements and fundamental concepts and methods of Informatics as a science. The need for students' digital technology literacy is very important and the importance given to it by the state becomes clear from the institution of the state certificate in informatics, at the end of compulsory education. Equally important, however, is education in Information Technology and its social implications, because the essential understanding of technology will enable students to create technology applications and innovations that they will invent themselves instead of just using off-the-shelf software.

Computational Thinking – Problem Solving

The effective use of computational tools to solve problems and the emphasis on cultivating computational thinking, in all classes of Primary School, aims to build important skills for the life of young students. It is expected to provide increased opportunities to students to be informed user-citizens and to become critically thinking creators through digital technologies.

Programming – Code Development

The development of algorithmic thinking and programming skills is now a new kind of circular knowledge and concerns everyone's compulsory education. Students at the end of Elementary School should be able to create their own simple programs in an educational programming language. Understanding how to give the computer a set of instructions that enables the completion of a specific task, students will understand the way computers work.

Data Analysis – Modeling: Cultivating data modeling skills

It is appropriate to start from Primary School, and the subject of Informatics constitutes the most suitable framework for the development of these abilities. The students will become able to describe and represent the key entities within a scope concerning the problem to be solved, the logical relationships that connect them, and to recognize the structure and the possible patterns that emerge from it.

Digital competence

Digital competence is organized, like any high-level competence, around a set of knowledge, skills, attitudes, and values. In principle, digital competence presupposes an adequate understanding and knowledge of the nature, role, and opportunities provided by digital technologies in everyday situations, such as personal and social life as well as at work. In this context, it includes the main IT applications, such as word processing, spreadsheets, creating

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digital multimedia content and presentations, databases, searching, evaluating, and managing information, as well as understanding opportunities and potential dangers of the internet and communication with digital media (e-mail, internet tools) for work, entertainment, information dissemination, and remote collaboration, learning, and research. Individuals also understand that digital technology can support creativity and innovation and come into contact with issues concerning the validity and reliability of available information.

Autonomous use of digital devices and computing systems

A particular component of digital competence, which should be addressed separately in the curriculum of the Primary School, concerns the ability to use various types of computers independently devices, both at the functional level and at the interface level between devices, as well as diagnosing simple malfunctions or problems. Students should have sufficient knowledge of operating basic devices (computer, tablet, printer, etc.), to be able to connect to the Internet by configuring relevant parameters or devices and to solve simple problems or malfunctions that arise during their use.

Effects of Information Technology and Digital Technologies on Society

The activity of children and adults on the Internet, in the context of everyday life, is becoming more and more extensive. The trade of goods, the provision of services, the services of the state to the citizens, education, and entertainment are now done over the internet. People and organizations increasingly have a hybrid identity, conventional and digital. Finally, the development of artificial intelligence applications is now affecting important areas of human activity with various effects. This situation makes it necessary to prepare the citizens to use the Internet effectively, and safely, with empathy for the multiculturalism of the medium, respecting copyright and personal data.

Digital citizenship

The ICT and Informatics Program aims at the preparation of all students so that they can actively participate in society and be able to prosper in the constantly changing conditions of the modern era. Students will develop knowledge and skills and adopt digital practices that are effective in a world that is expected to be increasingly influenced by technological developments. In addition, today's students should be prepared to be critical users of Internet services, be informed and aware of the issues of disinformation, online reputation management, and fraud risks, and the legal and ethical principles governing its interactive use. They should also have the skills to use the Internet ethically and correctly, with respect to intellectual property.

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Digital Technology and Education - Ability to use digital technologies as a learning tool and environment

Educational digital technologies (Technology Enhanced Learning & Educational Technology) have transformed the way we learn into formal and informal frameworks. The digital world offers a wide variety of options (e.g. Open Educational Resources, MOOCs, e-learning services, video tutorials, etc.) for anyone who wishes to learn and acquire new skills. To enable future citizens to participate in realizing lifelong learning they need to familiarize themselves with learning technology and the use of digital technologies as a learning tool and delivery environment of educational activities. Curriculum, students should familiarize themselves with digital learning technologies and practice self-directed planning of their learning for school issues and in general. Informatics as a scientific field, the application of this field (Information and Communication Technologies) and their application in solving problems (ComputerThinking) are becoming more and more important in the modern world. A modern ICT and Informatics program at the Primary School must effectively prepare all students –tomorrow's citizens, in order to be able to face the challenges and take advantage of the opportunities of the digital age, which is being shaped by the digital transformation of society and the economy on a global level.

Ultimately, the primary school curriculum in conjunction with that of the high school must pursue this providing a comprehensive program of compulsory education for all students of the country to acquire the necessary knowledge and skills of IT and Digital Technology for every citizen, as well as the infrastructure for their utilization in the continuation of their studies.

Purpose and Objectives of the Primary School ICT and Informatics Curriculum

The general purpose of the ICT and Informatics Program in Primary Schools is all students have increased opportunities and potential to develop the necessary digital and computing skills (knowledge, skills, attitudes, and values) that enable them to make adequate use of computing systems, digital devices and the Internet to collect, organize, manage and analyze data, express themselves, communicate and collaborate, create simple programs- as well as solve problems in a computational way inside and outside of school and finally understand the effects of digital technology on society and culture and to demonstrate behaviors of an active and responsible citizen.

In this context, during the implementation of the Curriculum, the students are expected to acquire a variety of learning experiences with digital and computing environments through the implementation, developmentally appropriate activities aimed at digital expression and creation and computational problem solving from the school program and from the wider school and social life, while the ultimate goal is to prepare students for participation in the modern Knowledge Society.

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The general objectives of the Study Program, therefore, concern the achievement of digital and information literacy and building computational thinking and include five dimensions: the technological dimension (fundamental knowledge and skills of using digital technologies), the cognitive and social dimension (information management, communication, collaboration), the dimension of problem-solving with digital technologies (creativity, modeling, decision-making, critical thinking, innovation) and the digital culture dimension which concerns specific knowledge, skills, attitudes, behaviors, and values regarding digital learning, digital citizenship, and digital security.

After completing Primary School, all students should be able to: use computing systems, digital devices, and the Internet in activities in and out of school to learn or to deal with everyday issues, develop digital content and create digital artifacts in diverse ways, organize, manage, process and analyze digital data so that—represent information and use it to make decisions, communicate, collaborate and learn using digital technology,—analyze, design, represent, control and improve a process that—describes solving a problem, develop programs in a programming language to solve simple problems or operate robots and automation,—think creatively and innovatively and develop skills of abstraction, generalization and computationally solving problems, critically understand the effects of digital technology on modern society—and behave ethically, responsibly and safely online.

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Expected learning outcomes

Informatics is part of Primary School intending to develop four basic literacies and the corresponding abilities that concern them:

- Information Literacy: It concerns the learning of elements and fundamental principles, methods– and IT practices for a deep understanding of technology so that students can be participants in its evolution and the creation of applications and innovations.
- Digital Literacy: Refers to the general use of computers and related digital devices, the use of system software applications (Operating System) and general use (Productivity Software) as well as the utilization of Internet applications for communication, collaboration, searching, evaluating, creating and publishing information and digital content.
- Literacy in learning technology: It refers to the ability to learn through life-long use– of digital technologies and their utilization in all courses as a cognitive tool and supervisory instrument.
- Digital Citizenship: It's about the cultured-civilized, responsible, and safe use of digital technologies in general and the Internet, its ethical and moral use, as well as the ability to participate in public and state governance processes in cyberspace through the Internet.

Consequently, upon completion of Primary School, all female and male students must be able to:

- be proficient in computer systems and digital technologies.
- to effectively use digital technologies in their school life and learning processes.
- to understand fundamental principles and methods of Information Science and to understand basic practices arising from it.
- identify real-world problems that can be solved computationally and transform them for this purpose.
- organize data, model, and design solutions for computing–problems.
- communicate and collaborate with digital technologies to share ideas and to co-create digital projects.
- to create their own programs and digital artifacts to solve problems.
- the presentation of information and the creative expression of their ideas.
- use computing environments and the Internet confidently, effectively, creatively, and ethically.
- to position themselves with a critical spirit and evaluate how digital technologies shape the new social, economic, and cultural environment of the 21st century.

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In other words, it's about developing a high-level skill in solving various types of problems with the help of digital technologies and is answered in the literature with the term "Computational Thinking".

Subject content - Thematic Modules

The general purpose of the ICT and Informatics Program in Primary School is for all students to develop basic digital and computing skills to express themselves, communicate and solve problems computationally in and out of school, and understand the impact of these technologies on society and culture.

This structure is common to all three grades (Elementary School – Middle School – High School) of the Computer Science Program. The proposed structure will form the basis for the detailed determination of expected learning outcomes per grade and class, as well as the identification of the learning activities to achieve the expected results. The adoption of the common structuring of the content of the ICT and Information Technology is necessary to ensure coherence with the Curriculum of the other levels, to avoid gaps, overlaps, and repetitions.

Of course, additional cooperation with the working groups of the other levels will be required for the continuous delineation of the expected learning outcomes.

The content is structured in five main Thematic Fields or axes, which have been defined in a unified and coherent way, from Primary School to High School. The Thematic Fields Include:

- a) the individual Thematic Units, which correspond to specific abilities that all students must develop upon completion of their studies at Primary school,
- b) indicative practices and learning paths that students are expected to follow in order to achieve the expected results but also to be able to continue to develop their IT skills.

Table 1 briefly presents the structure of the ICT and Informatics Study Program and the structure of the five Thematic Fields, while Table 2 presents the indicative distribution of hours of the fields by class:

- 1) Algorithmic-Programming of computer systems
- 2) Computer systems, Digital devices, Networks
- 3) Data-Analysis
- 4) Digital Literacy

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5) Digital Technologies and Society.

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Table 1: Thematic Fields and Thematic Modules of the ICT Curriculum and Elementary School Informatics

Subject	Sections
Algorithmic Programming computers systems	Algorithmic
	Programming Computer Systems
	Solve problems with programming tools
Computing systems Digital devices Networks	Computer systems and digital devices
	Computer networks and the Internet
Data Data analysis	Data collection and management
	Modeling, inference, and decision-making based on data
Digital Literacy	Use of Applications, Media, and Services
	Learning Technology and Technologically Enhanced Education
Digital Technologies and Society	digital citizenship
	Impact of Information Technology and Digital Technologies on

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society and culture							
Subject	Grades						Hours
	1st	2nd	3rd	4th	5th	6th	
Algorithmic Programming Computers Systems	9	9	8	10	11	11	58
Computing systems Digital devices Networks	5	5	5	5	4	4	28
Data Data analysis	4	4	3	3	5	5	24
Digital Literacy	12	11	12	9	7	7	58
Digital Technologies and Society	0	1	2	3	3	3	12
Hours	30	30	30	30	30	30	180

Purpose of the Thematic Fields of the Study Program

Purpose of the 1st Thematic Field "Algorithmic and programming of computer systems"

The 1st Thematic Field of the MS has as its object the algorithmic and programming of computer systems. It is a key pillar for cultivating students' computational thinking in order

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to solve authentic real-world problems. Computational thinking is a broader concept of algorithmic thinking (Bocconi, S., Chiocciariello, A., Dettori, G., 2016) (Sentance, S., Csizmadia, A., 2017). It is associated with the thought processes involved in formulating problems and their solutions so that the solutions are visualized in a form that can be effectively carried out through information processing (Wing, 2011). It is a high-level skill that is relevant to many aspects of life and scientific disciplines, not just IT (Bocconi, S., Chiocciariello, A., Dettori, G., 2016) (Yadav, A., Mayfield, C, Zhou, N., Hambrusch, S., & Korb, T., 2014).

The 1st Thematic Field includes three Thematic Modules:

- Algorithmic
- Programming and programming environments
- Problem-solving with programming tools (robotics and automation)

Key objectives of the **Algorithmic module** are identifying problems from everyday life, formulating algorithms for solving everyday problems, solving motion problems, recognizing graphic patterns, designing algorithms with a sequence-repetition-choice structure, identifying and solving decision problems algorithmically, formulating and checking logical expressions, representing algorithms in natural language and graphically, creating algorithms to deal with events, function/outcome prediction and algorithm reasoning, problem decomposition, generalization, generating algorithms with variables, comparing simple algorithms, abstracting and documenting algorithms.

For the second Topic Unit "**Programming and programming environments**", the main objectives are to identify the basic elements of a visual programming environment, to recognize the defined command set of the environment, to program with command tiles, to distinguish the individual components for creating and designing a program, programming using animation/display commands, converting an algorithm into a program, parameterizing commands, creating a program by selecting and exploiting appropriate sequence-repeat-selection structures, debugging a program, adopting error checking and correction techniques, creating a program for event handling, decomposing a program, logically documenting a program, abstracting to create/ comparing programs, generalization, creating a program with multiple entities, configuring the properties of a program's entities, using various data types in a program, creating appropriate numeric expressions, the use of variables, the creation of appropriate logical expressions, the use of multimedia resources in a program, the coordination of program entities through messages, the parallel execution of program actions, the creation of subprograms, the use of program data input-output mechanisms, the program and user interface design.

Finally, for the section "**Solving problems with programming tools (robotics and automation)**", the main objectives are to move into the area of robotic construction (with

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haptic/visual programming), create simple automations, solve problems with robotic constructions and programming automatic systems/robotic structures using sensors.

The three Thematic Units above are interdependent and are taught in each class. The topics under discussion are first approached algorithmically and then by programming and/or robotics etc. Starting from a young age, the emphasis is placed on playful activities, identifying problems, formulating algorithms, and kinesthetic and unplugged activities (McLennan, D., P., 2017), making students experience that a robot or computing device obeys specified commands/instructions of the programmer to solve a problem. The algorithms are then converted into programs and run on the computer. Programming errors are addressed as a component of the programming process. Students experiment with using commands and learn from their mistakes. They also adopt error detection and correction techniques. It is useful to encourage them to identify errors in a program collaboratively since novice programmers have difficulty identifying their own errors (Berry, 2013). Real-life problems are solved using robotics or automation. In older classes, emphasis is placed on creating a computational artifact. Examples include digital storytelling, animation, pattern design, simulation, and game creation (e.g. questions, maze exit, obstacle avoidance, etc.)

The purpose of teaching algorithmic and computer systems programming is not the learning of a specific programming environment, but the cultivation of algorithmic and computational thinking and the familiarization of students with programming structures, topics, and practices. Visual Programming Environments (VISEs) use command tiles and facilitate active student participation in solving authentic problems without additional barriers due to the syntax of text-based programming languages (K–12 Computer Science Framework, 2016). In addition, ODPs lend themselves to digital storytelling, simulations, and game creation, and are supported by learning communities that facilitate the sharing and reuse of software (Brennan, K., & Resnick, M., 2013)(K–12 Computer Science Framework, 2016). They thus become particularly attractive to children and contribute to building a cooperative and open culture.

In each class, the teacher selects and uses the developmentally appropriate POP for beginner programmers of the respective age (e.g. ScratchJr for grades A and B, Scratch for grades C), D', E' and F'). The criteria for the selection are the capabilities of the programming environment for the implementation of the computing structures and practices of the PS, as well as for the achievement of the corresponding learning outcomes. It is useful not to make many changes to the programming environment, to reduce the difficulty of adapting the students to a new environment. For the younger ages (e.g. 1st and 2nd Primary) it is suggested to use a simpler POP so that there are fewer commands available and the cognitive load and the difficulty of locating/understanding the commands faced by the students are reduced. In addition, suitable learning objects of Photodentro can be used e.g. <http://photodentro.edu.gr/lor/r/8521/11287?locale=el> and/or international/European initiatives to promote programming (e.g. Code.org or Code Week).

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The activities chosen are connected to the solving of authentic problems that concern the children, coming from their daily experiences, their school life, and lessons. The problems under discussion must have specific specifications to achieve the learning outcomes, but at the same time there is a degree of openness (e.g. choice of entities, appearance, etc., by each student), so in order to promote the differentiation of teaching, the meeting of children's needs and the inclusive character of the PS. Activities must be engaging and meaningful to students regardless of gender, cultural, or other background.

The teaching of the third module on solving problems with programming tools (robotics and automation) is interwoven with the available equipment of the school unit. Suggested:

- The use of certain robotic kits for consecutive use by student groups.
- In case the above is not possible, one kit can be used consecutively, while at the same time, the other student groups will work in a corresponding simulation environment.
- If no equipment is available, a simulation environment is chosen for student work. The teaching process is supported by the use of appropriate videos, any experiences of the students, and discussion.

For class A, ground robots with tactile programming (e.g. Bee-Bot, Blue-Bot, etc.) can be used, for class B, a microcontroller (e.g. Microbit, etc.), and in the following grades, robotic constructions suitable for the age of the students and the achievement of the learning outcomes of the PS (e.g. Thymio, Edison, Lego Wedo, etc.).

Purpose of the 2nd Thematic Field "Computer systems, digital systems, digital devices, Networks"

In the 2nd Thematic Area, the term Computing Devices includes elements such as digital devices, software, hardware, interfaces, and networks with which devices, people, communities, and services communicate. It includes devices such as electronic computers (desktop and portable), mobile technology devices (e.g. tablets, smartphones), wearable technologies (e.g. smart glasses, smartwatches, and wearables), robotic systems, etc.

Digital devices are used to collect, store, retrieve, analyze, and process information that can take multiple forms (text, image, sound, and video). They are composed of hardware (physical devices) and software (instructions). Understanding the function and interaction of all these elements is important for the user of any such system. Computing devices are usually interconnected in networks, exchanging information and data and sharing computing resources.

The general purpose of the Subject Area is for students to know that digital devices consist of hardware and software and to distinguish basic elements and characteristics of the architecture of computing devices and software applications. Also, the purpose of the

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Subject Area is for students to understand that digital devices are connected to networks and exchange data and services, as well as to know concepts such as reliability and security. The scope of this Thematic Field also includes human-computer interaction issues, at an introductory level.

Also, students should be able to enable/disable software applications, configure basic operating system parameters, solve simple hardware problems, and understand how the computer system works. Also, to raise awareness of computer system and network security issues and to use digital technology responsibly. Finally -in conjunction with axis 3- to come in contact with the way of storing data in the storage media and the coding of the information.

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Purpose of the 3rd Thematic Area "Data and Data Analysis"

Computing devices process data that is collected from multiple sources and media. The purpose of the 3rd Thematic Field is for the students to know different ways of collecting, storing, and organizing data in the computer system. Also, to represent the information they processed in formats they deem appropriate. Given the increasing amount of information provided on the World Wide Web, it is important to develop skills for processing large-scale data (big data) and their critical consideration. Finally, students must be able to operate at levels of abstraction, model information, and process it in spreadsheets.

Purpose of the 4th Thematic Area "Digital Literacy"

In the Curriculum, the 4th Thematic Area refers to the digital literacy of the students, which aims to build digital competence. Digital competence is necessary for the citizens of the 21st century in order to participate in social events and benefit from digital opportunities (Vuorikari R, Punie Y, Carretero Gomez S and Van Den Brande G., 2016). Digital literacy is one of the eight key competencies that every European citizen must acquire and one of the four fundamental skills for education. In addition, strengthening digital literacy is part of the European Union's Digital Education Action Plan (2021-2027), as well as one of the seven pillars of the Digital Agenda for Europe.

Digital literacy should facilitate students in the rapid and continuous process of adaptation in terms of how they read, write, search, compose, and communicate information both now and in the future (Coiro, J., Knobel, M., Lankshea, C. & Leu, D., 2008). Additionally, the circumstances of the COVID-19 pandemic have highlighted the importance of digital technology in education (International Commission on the Futures of Education, 2020).

The 4th Thematic Field is divided into two main Thematic Sections:

- A) Use of applications, media, and services.
- B) Learning technology and Technologically Enhanced Education.

The first section includes the creative use of technology for expression, presentation, collaboration, and search. The main objectives of the unit are:

- The utilization of basic Internet services for accessing information that includes navigating, searching, and evaluating information from the Internet.
- The creation of digital artifacts based on either original creation or mixing of digital resources (always respecting copyright) using software and/or online applications.

Examples of forms of these artifacts are digital stories, comics, digital books, images, photographs, collages, videos/animations, quizzes, crosswords, posters, recordings, musical

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patterns, etc. That is a set of multimodal narratives that allow children to express what they feel and think, simultaneously enriching the ways of decoding the digital world they are surrounded by (Hull, 2004), (McClay, J., Mackey, M., Carbonaro, M., Szafron, D., & Schaeffer, J., 2007).

- **Communication and collaboration through the use of Internet services (e.g. through email).**

Unit B includes tools and skills for the modern and lifelong learner, who uses technology to improve the knowledge and practices he follows at school, at work, in his free time, etc., depending on his interests and preferences. Utilizing digital tools, students create new learning opportunities either inside or outside the school context, gain responsibility for their learning, and participate in learning communities where they discover and adopt knowledge and skills from their more experienced members, in short, they learn how to learn (Buckingham, 2008) (Jimoyannis, A., Tsiotakis, P., & Roussinos, D., 2013).

In addition, the 4 Thematic Areas are associated with values, attitudes, and behaviors (Lankshear, 2006) Through their digital literacy, children learn a body of knowledge and technical skills so that they can make effective use of digital tools, but also develop a participatory culture that allows them to work equally with others, share and create new content following ethical rules, express their opinion responsibly and provide and receive support.

At the same time, students acquire a critical attitude towards the new digital media so that they can learn from them, constructively use them, and not become objects of manipulation (Kellner, 2003). The participatory and distributed culture of new media requires the development of new forms of critical analysis and thinking to empower the productive dimension of new technologies and minimize passive and uncritical content consumption (Buckingham, D., 2003).

Regarding the technical dimension of digital literacy, i.e. the acquisition of technical knowledge and skills, it should be emphasized that, because the digital tools and systems used are constantly changing and redefined due to technological changes, teaching them only makes sense at the level of general functionality and capabilities (Lankshear, C., Knobel, M., & Curran, C., 2012). The use of tools shouldn't be an end in itself for teaching but a means for expression and creativity, and always within a contextual framework that gives it meaning, enriching the children's learning experience and making it as pleasant and playful as possible.

Regarding the choice of digital tools to be used in this Thematic Field for the implementation of the activities, this should be done based on what the laboratory has available or use free and open software that does not require the use of personal data. In the event that accounts

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outside of PSD are required, it is recommended that the teacher create virtual accounts per school, per class, per group, or per student depending on what each activity requires.

Finally, the choice of the topic of the activities in this Thematic Field must have a strong interdisciplinary character and touch on the FPs of other subjects, other axes of the FP ICT and Informatics, as well as actions of school life and/or daily life. children's health.

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Purpose of the 5th Thematic Area "Digital Technologies and Society"

The purpose of the 5th Thematic Field is for the students to familiarize themselves with a series of issues concerning Digital Citizenship (Digital Citizenship) in accordance with the guidelines of the Council of Europe as well as with the impact of Information Technology and Digital Technologies on society and the culture. In particular, students should understand the effects of excessive Internet use on physical and mental health, as well as know the rights of Internet users - active participation: values and life attitudes that we adhere to on the Internet, shaping the digital environment. In addition, the axis aims to get to know basic digital governance services, copyright issues, and the General Data Protection Regulation (GDPR).

The curriculum of each grade is structured on this basis. Indicatively, here is the overall Study Program for the 5th grade:

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Table 2: Indicative Study Program for the 5th grade:

Subject Area	Individual Thematic	5 th grade	Activities
		Students are able to:	Students
1. Algorithmic and programming of computer systems	1.1 Algorithmic	<ul style="list-style-type: none"> -distinguish the concept of description (definition, and data) from solving a problem (algorithm) -decompose a problem into simpler ones that can be solved with specific steps, and devise solution strategies -generalize solutions to categories of problems -use variables in their algorithms - formulate complex logical expressions (use logical operators) and predict their result -choose the appropriate control structure in the algorithms they write -compare alternative algorithms developed for the same problem 	<ul style="list-style-type: none"> -study a problem (e.g. text encryption with Caesar's algorithm). They analyze and outline the solution steps, ask questions and plan alternative paths, think about dealing with all situations, and generalize their solutions -analyze a problem and consider criteria, such as how many cases need to be investigated to solve it, whether the steps are known or not, etc. They present their solutions to the plenary and compare them with those of their classmates

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Subject Area	Individual Thematic	5 th grade	Activities
	1.2 Programming and programming environments	<ul style="list-style-type: none"> -understand the necessity and usefulness of selection and repetition structures in planning -form syntactically correct logical expressions in the programming environment -understand the necessity and usefulness of variables in planning -apply error checking and correction techniques to the programs they create -plan the interaction of the entities using mechanisms such as message coordination and synchronization - describe the concept of parallel execution of actions through simple examples -use subroutines in their projects to create new commands - recognize the characteristics and advantages of the sub-programs -adopt the use of subroutines in their projects to make their programs simpler, readable, and modifiable 	<ul style="list-style-type: none"> -program in visual programming environments with tiles creating simple educational games with themes drawn from personal interests, school and social life and/or the cross-curricular field, e.g. they could implement applications with mazes or educational games of graded difficulty. Programs use variables (e.g. for the score) and parallel execution of blocks of instructions -implement simple subroutines and discuss their advantages in programming

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Subject Area	Individual Thematic	5 th grade	Activities
	<p>1.3 Problem-solving with programming tools (robotics and automation)</p>	<p>-digitize text character data with the help of the given steps</p> <p>-describe the basic elements of computing device architecture (e.g. CPU, storage media, I/O units, etc.) and how they work</p> <p>- acknowledge that access to hardware and software of the computer system depends on the rights of the user</p> <p>- they recognize that through the operating system, the users' classified access to hardware is certified</p>	<p>- study possible scenarios of use of computing systems (computers, mobile devices, and smartphones), such as use for Internet browsing, distance learning, gaming, and office applications, and describe key desired features based on options they study on the Internet. They compare and come to generalizations</p> <p>-connect the basic parts of a computing system using simulations as well as physical representations</p> <p>-use the control panel to manage their computer system hardware and account rights</p>

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Subject Area	Individual Thematic	5 th grade	Activities
	2.2 Computer networks and the Internet	<ul style="list-style-type: none"> -recognize the role of servers in the operation of networks - describe simply the process of sending/receiving information in networks -distinguish the difference between the local network and networks of greater geographical scope - analyze website and web page addresses -recognize the need to use additional user authentication methods in applications and devices connected to computer networks -judge the reliability of sources related to software they wish to install 	<ul style="list-style-type: none"> -describe the role of the server in the transmission of data (files and web pages on the World Wide Web) and the operation of local networks and the Internet -categorize computer networks based on geographic dispersion -describe the parts and properties of the parts of a web address on the World Wide Web -distinguish additional security features on websites (CAPTCHA, HTTPS, etc.) and discuss their feasibility -check the reliability and validity of software download sources in a simple way

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Subject Area	Individual Thematic	5th grade	Activities
3. Data and Data Analysis	3.1 Collection and Management of Data	-recognize file and folder properties -gather data from a variety of sources using their own tools or from the Internet	-Use File Explorer to view basic properties of files and folders (date created and modified, size, editing application, read-only, hidden files)

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Subject Area	Individual Thematic	5 th grade	Activities
	3.2 Modeling, inference, and decision making based on data	<ul style="list-style-type: none"> -format a spreadsheet - enter simple calculation relationships into a spreadsheet -use techniques of copying data and mathematical calculations into a spreadsheet -manipulate data with spreadsheets by performing simple operations and using functions -visualize data with simple graphs using the data of a spreadsheet -recognize that AI systems are "trained" with large amounts of data to make decisions -recognize that machine learning systems rely on algorithms to recognize patterns and/or relationships in the data 	

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Principles, directions orientations for the Informatics Program in High School

Directions for content - Balance of Digital and Information Literacy

Informatics in High School should harmoniously combine the development of Digital Literacy (Ability to use Information and Communication Technologies - ICT) with education in elements and fundamental concepts and methods of Informatics as a science. The need for students to be literate in Digital Technologies is very important and the importance given to it by the state is made clear by the establishment of the state IT certificate. Equally important, however, is education in Information Technology and its social implications because a substantial understanding of technology will enable students to be able to build technological applications that they will invent themselves instead of only using those prepared by others. The pun "Program or be programmed" that (Rushkoff, D., 2010) uses as the title of his book is typical to highlight the critical importance of knowledge of Information Technology for active participation in modern becoming.

Preparation for new types of problems: Also, according to the directions of (Tissenbaum, M., & Ottenbreit-Leftwich, A., 2020) the Information Technology System should prepare students to solve new types of problems with the help of Information Technology. Several IT ideas, methodologies and practices from areas such as Data Science, Artificial Intelligence, Machine Learning, Quantum Computing are changing the way Computing is applied in everyday life. Most of them require less code writing and more understanding of how they are implemented (Shapiro, b. and Tissenbaum, M., 2019). For example, very few students will need to program a machine learning algorithm themselves, but many, if not most, will need to understand critical issues related to the training and evaluation of such algorithms as well as the issues of bias and of justice related to machine learning. For TN, students must be concerned with ethical issues such as e.g. assigning responsibilities in case of an accident with driverless vehicles, studying historical problems with decision-making based on biased algorithms. The Internet of Things will highlight the importance of ecosystemic thinking. Data science applications reinforce the importance of data collection in ways that favor the development of computer models and their critical evaluation. Incorporating topics such as the above into the PS will make the IT course relevant to more students, so that they are actively involved.

Use of IT as an interdisciplinary tool: (Tissenbaum, M., & Ottenbreit-Leftwich, A., 2020)also, sharing the view that in the coming years IT literacy will continue to be integrated into a number of scientific fields (e.g. Physics, Economics, Environmental Science) propose the introduction of interdisciplinary problem solving in the context of the PS so that the students understand the use of Informatics as an epistemological tool and methodological component in the various sciences, which they may choose to study in the future.

That is, to understand the role of Informatics in the other sciences because this is crucial for their future success in these fields. For example, students will be able to build sensors to

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collect environmental data as part of an educational project or collect data and visualize it to answer questions about the economy in specific historical periods. The interdisciplinary approach of Informatics creates connections with the IS of the other knowledge subjects and there could be a corresponding unit in each of them separately.

Comparison between Primary and Secondary education

The IT Plan for the Primary and the Secondary education in Greece- designed in 2011 and improved in 2021- share the same principles. The ICT modules in particular were utilized to a great extent in the new curricula. The modern developments in Informatics as a science, in its effects on Society and Culture as well as in Teaching, imposed a series of changes in the curricula. According to the proposals of the supervisors, for the main principles of the new curricula and the role of Digital Technologies, revisions, updates and improvements were attempted with the aim to:

Adoption of a philosophy of a Unified Framework of Study Programs for Informatics, from pre-school education to High School based on learning progress tracks and learning standards

With the design choice of adopting common structuring of the content, the new PS ensures continuity and the developmentally appropriate distribution of the concepts and practices of Informatics from the 1st grade of the Primary School to the 3rd High School. The content is organized in 5 areas with common thematic units (table 1) for all grades and the Expected Learning Outcomes are formulated in a coordinated manner so that there is a smooth transition from grade to grade and from grade to grade without gaps, overlaps, and repetitions.

Strengthening and deepening the digital skills of students and connecting them with the key skills of the 21st century (critical thinking, communication of ideas, collaboration, creative thinking, self-regulation of learning, innovation, etc.) (Johnson, 2009)

For this purpose, the new PS seeks to develop digital literacy skills, which means: familiarity and use of digital technologies and their applications to solve practical problems, increase their productivity, and creative expression in the context of authentic problems. The strengthening of the existing FP with a systematic and updated approach to the social impacts of digital technology and IT contributes to the same goal, a section that was not clearly developed in the previous FPs.

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Strengthening the understanding of Informatics and Digital Technologies (Computing Literacy/Computer Science Literacy)

In the new Informatics PS, it is important to give space to the construction of fundamental concepts and methods of the science of Informatics so that students know 'how and why' digital technologies work beyond 'how' they are used. In this way, they will be able to develop as creators of solutions and technologies beyond "consumers"-users of ready-made applications and thus will be able to participate in shaping the digital transformation of the world. In the new PS, new sections will be added for this purpose, such as e.g. Supplemented with new subjects Artificial Intelligence, Data Science, Material Programming and Educational Robotics, Computational Thinking for the Sciences, Learning Technology, Networks, and Cyber Security.

Development of Computational Thinking skills, abilities to investigate and apply problem-solving methods with computational tools

This goal contributes to the development of Computational Thinking skills, i.e. the Use of IT practices to solve problems in other subjects and knowledge production. The approach to the development of IS in the new PS is made horizontally through all thematic areas with the selection of interdisciplinary problems for the application of Informatics methods in their solution. In addition, in the new PS, there is a clear thematic unit on solving scientific problems in order to cover the field of computing science, which has been developing rapidly in recent decades. This also serves the purpose of approaching Informatics as a general education subject in compulsory education with educational value for future scientists regardless of subject. In the new PS, an attempt is made to show as many combinations of problem-solving methods with computing technology as possible (e.g. Algorithmic, Automation of Calculations, Multiagent Systems, Systems modeling, Modeling-Simulation, Data analysis, Visualization) with the fields of application (e.g. Positive, Social and Human Sciences). Also, the High School Informatics Program cultivates research-innovation-development skills, utilizing the pedagogical approaches of the maker movement, educational robotics, and physical computing.

Interdisciplinary and interdisciplinary approach

In combination with the approach of YS, Educational Robotics, and hardware programming, the new PS provides students with opportunities for a meaningful connection of Informatics with other subjects and, above all, with Mathematics and Natural Sciences. The interconnection may concern the application of generalized problem-solving methods from IT to other fields, the production of knowledge in experimental sciences with the help of computational modeling and simulation, in approaching problems with data processing and in construction, inventing, tinkering and design projects combining knowledge from the STEAM fields.

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Social Effects of IT and Digital Technologies

The activity of children and adults in cyberspace in the context of everyday life is becoming more and more extensive. The Internet has become the vehicle of the globalized society, trade of goods, provision of services, government services to citizens, education, entertainment, etc. are now done via the Internet. People and organizations have a hybrid identity, conventional and digital. This situation necessitates the preparation of the citizen so that he/she can navigate cyberspace effectively, and safely, with an awareness of the medium's multiculturalism, respecting copyright and personal data. Students will be able to participate in the global culture of the Internet by combining it with their identity and projecting their cultural heritage. In addition, today's students should be prepared to be critical users of Internet services, to be informationally literate, and to know the issues of misinformation, online reputation management, and fraud risks. Finally, tomorrow's citizens will be prepared to participate in democratic processes via the Internet as active citizens (Digital Citizenship).

Digital Technology and Education - Ability to use digital technologies as a learning tool and environment

Digital technologies (Technology-Enhanced Learning & Educational Technology) have transformed the way we learn in a formal and informal context. A wide variety of options (e.g. Open Educational Resources, MOOCs, e-learning services, video tutorials, etc.) exist in the digital world for anyone who wishes to learn and acquire new skills. In order for future citizens to participate in the realization of lifelong learning, they need to familiarize themselves with learning technology and the use of digital technologies as a learning tool and an environment for providing educational services. The new PS allows students to become familiar with digital learning technologies and to practice self-active planning of their learning for school and general subject

ICT in the Greek Educational System

Information and Communication Technologies (ICT) are structural components of modern society and have decisively influenced each aspect of the citizen's daily life in the areas of administration, economy, education, culture, entertainment, etc. In this context, ICT is a key tool for the transformation of the school, the support and enhancement of learning, and the upgrading of the educational result. The goal of the updated Greek curriculum is ICT to enhance learning and to prepare the continuous development of students from Primary years to High School, aiming to participate in the society of knowledge and technology in order to be able to face the challenges but also to take advantage of the opportunities of the new era.

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The New ICT Curriculum and Computer Literacy in Primary Schools identifies and specifies the dimensions of computer literacy, the skills (knowledge, skills, attitudes, and values about ICT) that should be developed by all students and are necessary nowadays [167].

The purpose of this text is to precisely identify one integrated-coherent framework of Study Programs for ICT and computer literacy in Primary Schools in Greece and to describe the necessary elements (teaching objectives, learning outcomes, core subject areas, proposed learning activities, educational material, and software), to achieve its implementation in every school in the country. The term ICT literacy describes the ability of students to use modern digital technologies, tools, communication, and network services for access, management, integrating, evaluating, creating, and communicating, in terms of problem-solving, learning, and continuous development.

In modern Study Programs, computer literacy is considered a cognitive learning subject of equivalent importance to language literacy, mathematics, and scientific literacy). Consequently, the inclusion of ICT in Primary School is neither a goal for students' familiarity with computers and specific software nor, much less, training them in ephemeral technological skills. ICT is fully integrated into the daily work of students and teachers and every subject of the Study Program. Digital technologies and digital literacy are integrated into all subjects, and rich digital material is formed [162,168] in order to:

- support the modern pedagogical approaches to learning.
- solve problems and develop critical thinking and creativity.
- explore, construct knowledge, and collaborate to achieve learning goals.
- maintain a window of communication with the modern world independently of time and location.

The proposed framework for the integration of ICT in education follows the principles and philosophy of teaching programs for primary education which are implemented across the country, and is structured into four interdependent components:

- ICT as a learning-cognitive tool: ICT runs horizontally through all subjects of the Study Program and is considered to support modern pedagogical approaches, communication, research and collaborative learning, development of critical thinking, and students' creative ability.
- ICT as a tool under a problem-solving methodology: Students engage in problem-solving activities aimed at cultivating methodological skills (data processing, design and Algorithm implementation, solution modeling, creativity, and innovation) and high-level skills.
- ICT as a technological tool: Students become familiar with computers and modern ICT tools. This perspective aims at the continuous development of technical skills and

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proficiency in handling modern environments of ICT (general purpose software, educational software, Internet services, etc.).

- ICT as a social tool: Students know and evaluate the applications of ICT in modern society (administration, work, sciences, education, entertainment, culture, etc.).

Moreover, the new guidelines are quite focused on STEM (Science, Technology, Engineering, and Mathematics) philosophy, which is based on the idea of a holistic teaching and learning of science with the familiar use of means of technology [169]. The available equipment in each school may differ but in all of them, there are desktops and laptops, tablets, and projectors. Moreover, there are plenty of free applications for a wide variety of uses and tasks. That modern approach and equipment are encouraged to be used from Pre-primary years to Higher Education.

In addition, the New social and civic learning Curricula aims to create the Digital citizens of tomorrow and to cultivate a healthy digital citizenship culture. Under these terms, the students would be able to:

- To clarify the concept of digital citizen and digital citizenship and to be tolerant of digital inequalities.
- To recognize and participate in digital environments open to diversity and diversity of opinions.
- To apply safe techniques of searching for information on the internet, evaluate them critically, and determine their reliability.
- To defend issues of protection of Copyright.
- To name the rights and responsibilities of a digital citizen.
- To participate respectfully and responsibly in an online community.
- To recognize and face cyberbullying.

The ultimate goal is to acquire wider digital literacy and shape attitudes and values so they will understand the new social and cultural environment that is taking shape in the present time. Following that spirit of ICT inclusion in the teaching and learning process, teachers can upgrade their knowledge and skills in ICT by participating in workshops that are organized by the Ministry of Education in all regions of Greece in order to be certified with Level A and Level B of computer literacy [167].

The ICT in Special Education

It is necessary to achieve an education for all, based on the principles of participation and equality. Education plays a key role in determining everyone's future, both on a personal and social basis. Therefore, the educational system can contribute to personal development and

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social inclusion, which will allow children and young people with disabilities to become as independent as possible.

The implementation of ICT in education, and especially in Special Education consists in the exploitation of positive evidence they provide depending on the teaching subject and the objectives concerning the special educational needs of each category of students. Technology can largely replace elements of the handicap or disability bringing the student closer to the cognitive good but also to social reality since it enables him/her to communicate with his/her environment and his/her interaction with it. In this way, the barriers from the nature of the handicap or disability arise and the goal of social inclusion and integration becomes more likely to achieve.

The categories of such students are:

- (a) People with vision problems
- (b) People with mobility problems
- (c) People With mental retardation problems
- (d) People with hearing problems

The goal, in short, is to create a school for everyone, with educational materials, programs, objectives, infrastructures, and support dynamics to serve expectations responsive to diversity.

In general, the use of ICT allows students with special educational needs to participate in the educational process with many chances of success.

Students who, due to their serious physical disabilities, are forced to stay at home and manage to watch with the help of the computer distance learning and master the knowledge. In addition, the continuous development of electronic communication networks (Internet) provides important possibilities and opportunities for kids and young people with special educational needs to self-educate by transforming their free time – often they are confined to a wheelchair and watching TV – in time of the study, self-education, and productive work. The use of ICT is a great challenge to our society for equal participation of students with special needs in cultural and educational activities and educational needs.

For students with special educational needs, ICT helps in the learning process by providing rich educational experiences. However, the teaching program must be enriched and modernized with advanced educational and technological environments as well as with learning and entertainment features. The PC and its peripherals, give many opportunities to people with special needs because students get hands-on learning and working at their own pace. The electronic components and training software restore physical weaknesses (fine mobility, vision problems) of children and help with access to information and therefore in their education. People with physical disabilities need extra, additional support, and

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information technology has the means and tools to help provide three types of access: physical, cognitive, and supportive. At physical access, PCs provide physical access to students with physical disabilities (e.g. use of switches even with eyelid movement, use of portable communication devices that replace speech offering typed messages, etc.). In cognitive access, PCs provide cognitive access to students with learning difficulties, e.g. the use of pictures (makaton) within written texts helps in learning to read. And in support aid, a large part of the students who face learning difficulties receive support, and feedback. (Τσικολάτας, A., 2011)

The difficulties that are often encountered in the application of technology in education have to do with:

- a) How a learning problem can be recognized as well as the ineffectiveness of traditional ways of teaching.
- b) The necessary knowledge of computer operation by the teacher who will select the appropriate software of the special technology that will provide a solution to the student's learning problem.

The use of ICT has caused various reactions among the experts in Education that can be summarized in three main groups (giving, however, emphasis on the role of the teacher):

It is a fact that a united education is needed for all, with an emphasis on the following principle:

The system is important to meet the needs of all children, rather than the children to be made to fit into the system, but also no part of the system should be altered to serve an individual or a group of individuals. And that is about the entire educational system; not just for schools or for one area of Education.

The utilization of ICT is connected to the unified education school and has a relationship with the child, the family, and in general with the philosophy of our society. Also, the fundamental rights of all children must be considered as opportunities for participation in a unified education system.

The main educational goal is for all children to achieve autonomy, the ability to communicate, access information, socialize, and show academic progress. That sort of progress goes along with school development.

The use of ICT in education should not separate the special from the general education. There must be a supporting mechanism, as well as a law framework to protect, control, and evaluate the system. So that system evolves towards the benefit of the child. The child must have equal opportunities and rights to access education in all schools.

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The pedagogical role of ICT can be determined for all categories of general and special students into five levels:

- In the actual training of individuals in ICT as a separate subject for the purpose of technological literacy and shaping the conditions for professional development (knowledge and skills).
- In the use of ICT as a medium for the extraction of information in any form, as a means of restoration, communication with persons and environments with which was impossible due to the nature of the handicap or the disability. It therefore functions as a medium, broadening the cognitive horizon.
- In the utilization of ICT as a means of communication and supervision.
- the use of ICT as a cognitive tool for knowledge expansion.
- In the use of ICT for relaxation and fun.

The benefits from the introduction of ICT in the Education of students with special educational needs, which highlights the necessity of its implementation, are briefly located in the following points:

Table 3: Benefits from the introduction of ICT in the Education of students with special educational needs

The ICT	Utilization in special education
Programming ability as thinking machines at the level of teaching, learning, and communication	Motivate special students
Ability to configure interaction in fields that were impossible to access	Socialization, cooperative learning
Adaptation to the level of learning ability of the individual, consequently in their special possibilities and at their limits.	Development of confidence, and active participation, according to their abilities

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<p>Requirement of all existing abilities of individuals, since they provide 3D image, sound, speech, traffic, digital systems,</p> <p>possibility of recruitment and dispatch of sensitive sensory messages of the user</p>	<p>Strengthening their self-confidence</p>
<p>Modeling ability in problematic cognitive areas</p>	<p>Continuous contact with educational goods when impossible, due to particularity, to have immediate access to them</p>
<p>Ability to create microcosms simulations and other open learning environments</p>	<p>Provision of educational environments that activate many of their senses and therefore the individual as a Whole.</p> <p>Balanced development of the whole from a closed school environment in one open pedagogic space in which parents (and other social partners) participate as co-educators and co-therapists</p>

Indicative Effectiveness Reports – “Smart Appliances”

Students with special learning difficulties

The Visual and auditory stimuli provided by the computer, clear and orderly presentation of the text, and proper software aimed at correcting errors and reminding them of grammar rules, especially help these students (e.g. dyslexia- it's about problems with reading and writing). (Singleton 1991).

Students with motor problems and sensory dysfunctions

Students with physical disabilities (weaknesses of movement) or malfunctions of the sensory organs (vision problems and hearing). The students who cannot make even simple movements: such as picking up a pencil, turning a page of a book, or writing. Some indeed are unable to fix their gaze, to keep a steady head.

The new technologies suggest:

- Special devices that are attached to the head or foot and with the help of a component the keyboard can be used. Furthermore, the user is enabled to look at the screen, in which the elements appear sequentially and with correspondingly slow rates, to give the appropriate command with a simple switch or by moving some special cable.
- There are many examples of those, paralyzed people where with the voice or their blink of an eye they manage to use the computer and have results similar to those of individuals without kinetic problems. For students who present slight forms of mobility dysfunction devices have been developed, such as keyboards, that are not affected by clumsy handling of the user (such as flickering of hands, unsteady hand movement, long press of the keys, or pressing multiple keys at the same time). There is also corresponding hardware and software that realizes many automated functions minimizing the way of the complexity of the required movements.
- Students who tire easily due to muscle weakness can use laptops at school and respond successfully to the requirements of the school.
- Those unable to speak can communicate through the computer, typing the signals they want. There are also programs with screen-reader as an essential tool for any blind user, since with the help of the voice synthesis program it contains, it achieves the reading of the display data through the sound card and the computer speakers.
- Simultaneous support of Braille displays gives individuals with vision problems who use them a further possibility of access to information. Programs that can speak any text that appears on the screen (documents, menus, websites, emails, etc.) even pronounce the icons and most graphic elements. Also, students presenting vision problems (blind students) have the possibility to work with touch keyboards and using appropriate software that utilizes the hypertext media, can have access to the bibliography.

- Students with mental disabilities or mental retardation who learn at a very slow rate in relation to the rest or for those with mental retardation (Intelligence Index < 70). These students through appropriate simulation games and the use of corresponding keyboards, images, or concepts, can be involved in everyday situations (such as money transactions, comparisons, and calculations of sizes) understanding this way mathematical concepts. In addition, the use of programs allows them to explore mathematical relations, approach Geometry, and discover quantitative phenomena. The Financial simulation programs help students with mental disabilities or mental retardation to manage to learn basic arithmetic operations (addition, subtraction, multiplication) or solve elementary numerical problems. Also, with ICT use slow learners can use database software to master mathematical concepts and acquire problem-solving skills.
- Accessibility to WEB for people with special needs and school intranets with assistive technologies. The W3C (World Wide Web Consortium) was created to lead the WEB to its full potential with the development of the commons of protocols that promote its evolution and ensure its interoperability.
- The Interactive Whiteboard is an innovative tool of teaching that helps students to act energetically and complete procedures with great pleasure and satisfaction. In special education, it finds suitable ground since they help to overcome enormous difficulties. People who have not developed fine mobility skills for the use of the mouse; make excellent use of the ir-pen. The visually impaired students overcome their difficulties by having in front of them a large projection of the computer screen on the wall, through the projector. Students with mobility problems, in addition to learning problems, also practice movement exercises which are often required to move from one side of the message to another.
- Practical experience has shown that the same exercises, the same problems, and the same games, take on another dimension when they are transferred from a stationary computer calculator on an interactive whiteboard.
- Even a painting drawn on a computer screen becomes a work of art when it becomes an interactive table. Editing text and interacting with the environment is now easy.
- Learning outcomes are obviously more than satisfactory. Everything is like a game, learning becomes a game and through play the student with special needs acquires and improves abilities, skills, and knowledge.
- PC games offer a lot of motivation since they can provide a unique opportunity for adventure. The use of virtual reality comes to strengthen this part.
- Specialized software, educational programs, lessons, and games are developed for students with special needs to cope with their difficulties and to develop their learning.

The goal is the creation of support equipment laboratories in special education units that serve teaching and learning in specialized categories for special people.

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The inclusion of new technologies in the educational process of the disabled, except from satisfying the need to provide equal opportunities, can substitute to a large extent elements of disadvantage or disability, bringing the student closer to the cognitive good, but also to social reality, since it gives him/her the possibility of communication with his/her environment of interaction with it. In this way, the barriers that emanate from the nature of the disadvantage or disability and the individual come closer to school integration and social integration.

ICT in the teaching of Cultural Heritage

Under the umbrella of interdisciplinarity in the Greek public educational system, technology plays a vital role in teaching and learning a wide variety of subjects. In some subjects that relation is obvious but in others, it seems challenging to combine the subjects of cultural heritage by using tech achievements.

Greece has a very rich and wide Cultural Heritage created from prehistoric years until nowadays. That heritage is deeply related to many teaching subjects as mentioned above. In terms of teaching culture, by taking advantage of new technological tools, knowledge, and skills, the educational institutions have formed a new framework of curricula that includes the horizontal use of means of technology. As mentioned in the new framework of environmental education, the students get familiar with their local cultural heritage from the first grades of school and later they learn about national and international Cultural Heritage under the terms and conditions of the new methodology of teaching, including the use of ICT [170]. So, they can simply watch a video, do research, and write a document or they can develop a new site on the internet according to their level and skills.

New books try to align with this technological new era and to give activities and opportunities to include the utilization of new tech tools. For example, books share links for study and research, propose tasks requiring the use of a laptop or tablet, and challenge students with creative assignments that new applications of technology can be used [171].

Students can learn about the Cultural Heritage starting from local and continuing to national and international by using all the modern aspects of technology. Methods like virtual reality, robotics, 3D-printing, coding, programming, data analysis, surfing on the internet, real-time communication, and picture and video editing are only a few applications of a wide variety of tools that they can use to learn, and understand about culture.

Of course, all this technological transformation of the school needs time but many steps have been made and the effort to bridge the distance between those two subjects (cultural heritage and ICT) is a great potential to teach culture in pre-primary and primary years, in so many interesting and meaningful ways through the use of new technologies.

Conclusions - Suggestions

In general, the use of ICT allows students with special educational needs to participate in the educational process with many chances of success. Students, who, due to their serious physical disabilities, are forced to stay at home, manage to watch with the help of the computer distance learning and master the knowledge. In addition, the continuous development of electronic communication networks (Internet) provides important possibilities and opportunities for children and young people with special educational needs to self-educate by transforming their free time – often confined to a wheelchair and watching TV – into time of study, self-education, and productive work. The use of technology is the great challenge of our society for equality and participation of students with special needs in cultural and educational activities in accordance with their educational needs.

Despite the difficulties, Education without new technologies will certainly be something so unimaginable for the next few years. Without the new technologies, the polyphony, and its psychological applications in the Society of Information, growth cannot be fostered. On the other hand, the possibility for large and fast scaling of broadband and network infrastructure as well as the rapid development of digital educational content push us to have more hopes for the improvement of education for all citizens. Technology shouldn't be something unknown for people with special needs even if it comes to enhancing learning, and should be appreciated to the fullest extent.

This is why teaching is important. The teacher must be trained in new technologies. The teachers who work in Special Education should point out the problem, work with others to solve specific problems, and find solutions.

Educators are invited to deal with the multidimensional problems of people with disabilities, applying new technologies to Special Education, according to the research results of Psychology, Pedagogy, Medicine, and other sciences.

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3.2. The Case of Italy

Introduction

Italy has developed a series of national digital strategies to modernize the country, promoting technological innovation, improving economic competitiveness, and addressing the challenges related to digital transformation. These strategies span a wide range of sectors, from public administration to the economy, from education to healthcare, with a holistic approach aimed at creating a more advanced and inclusive society.

In particular, the Italian digital strategies for the school sector and inclusion have been designed to transform the education system, incentivize the use of digital technologies, and ensure that all citizens, regardless of their socio-economic conditions, can access the opportunities arising from the digital revolution. This integrated approach aims to reduce inequalities, enhance digital skills, and ensure that technological innovation serves the country's equitable and sustainable development.

In recent decades, the world has witnessed an unprecedented acceleration in the adoption of digital technologies, which have profoundly transformed every aspect of daily life, including education. In this context, the National Digital Plan for Schools presents itself as a strategic and necessary response to address the challenges and opportunities offered by digitalization in the educational sector.

The Italian context

Context and needs of the National Digital Plan

The current context is characterized by rapid technological development that has affected the ways of learning and teaching. The emergence of new technologies, such as artificial intelligence, augmented reality, and online learning platforms, has made some traditional models of education obsolete, raising the need for a radical change in the way schools operate.

In Italy, the digital divide represents one of the most significant challenges. Many students, especially those from disadvantaged socio-economic backgrounds, do not have access to adequate devices or a reliable Internet connection. This gap not only limits learning opportunities but also contributes to perpetuating social and educational inequalities. The

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National Digital Plan therefore arises from the need to guarantee equal access to digital educational resources, promoting inclusive and quality education for all.

The recent COVID-19 pandemic has accelerated the process of digitalization, forcing schools to quickly implement distance learning solutions. This situation has highlighted not only the importance of technology in Education but also the need for adequate preparation to deal with unforeseen situations in the future (Ministry of Education, 2020).

Objectives of the Plan

The National Digital Plan for Schools aims to achieve clear and ambitious objectives, including:

1. Integration of digital technologies into the school curriculum: Promote the use of digital tools and resources to improve teaching and learning, making lessons more interactive and engaging.
2. Continuous training for teachers: Ensure that educators receive adequate and continuous training on digital technologies so that they can use them effectively in their teaching practices.
3. Equitable access to digital resources: Ensure that all students, regardless of their socioeconomic background, have access to devices and internet connections, reducing the digital divide.
4. Development of digital skills: Prepare students to become competent digital citizens, able to use technologies critically and responsibly.
5. Promoting personalized learning: Using technologies to create personalized learning paths that respond to the individual needs of students, encouraging autonomy and motivation (Ministry of Education, 2020).

Importance of digitalization in education

Digitalization in education is not just about access to technology; it is an opportunity to revolutionize the way students learn and interact with knowledge. Digital technologies can facilitate active and collaborative learning, promoting greater student participation and making lessons more dynamic.

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Furthermore, digitalization offers tools for personalizing learning, allowing teachers to adapt educational experiences to the specific needs of each student. Thanks to online learning platforms and digital resources, students can access diverse content and delve into topics of personal interest, thus developing critical skills such as critical thinking and problem-solving.

Digitalization prepares students for the future, equipping them with the skills needed to face an ever-changing job market, where technology plays an increasingly central role. In a globalized and interconnected world, digital skills are essential not only for professional success but also for active and conscious participation in society.

The National Digital Plan for Schools represents a crucial step towards a more inclusive, innovative, and future-proof education system. Its implementation will not only improve the quality of education in Italy but will also help build a more equitable and prosperous society (Ministry of Education, 2020).

Evolution of digital teaching in Italy

History and development of technology in education

The introduction of technology into education in Italy dates back to the 1980s and 1990s when computers began to appear in classrooms. However, the integration of digital technologies into the educational process has been slow and uneven. Initially, the use of computers was limited to separate computer labs and was not an integral part of the school curriculum.

With the advent of the Internet in the 1990s, a significant change occurred. Schools began to equip themselves with Internet connections, allowing students to access online educational resources. However, the lack of adequate training for teachers and insufficient resources limited the effectiveness of these initiatives.

In 2007, the Italian Ministry of Education launched the "Scuola Digitale" project, which aimed to promote the use of digital technologies in schools. This project was a major turning point, as it initiated a series of initiatives to equip schools with technological infrastructure and digital resources. Since then, the focus has been on creating digital learning environments and teacher training.

In the following years, the spread of mobile devices, such as tablets and smartphones, further accelerated the process of digitalization. Mobile technologies made learning more accessible and flexible, allowing students to learn anywhere and anytime. However, the

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digital divide remained a central challenge, with many schools facing a lack of technological resources and adequate infrastructure (Calvani, 2008).

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Educational policies and digitalization

Italian education policies have sought to respond to the growing need for digitalization in the school system. During the government of the Ministry of Education, several plans and initiatives have been adopted to promote the use of digital technologies in schools.

One of the main instruments of educational policy was the "Piano Nazionale Scuola Digitale" (PNSD), launched in 2015. This plan outlined a comprehensive strategy for integrating digital technologies into the school curriculum and set specific objectives for teacher training, access to digital resources, and the creation of innovative learning environments. The PNSD also encouraged collaboration between schools, universities, and businesses, promoting the creation of innovation networks.

In addition, the Ministry has launched funding programs to support schools in purchasing technological devices and implementing digital projects. These funds have had a positive impact, allowing many schools to equip themselves with adequate resources and launch training initiatives for teachers and students.

Despite these efforts, significant challenges remain. The digital divide, both regionally and socioeconomically, continues to be a barrier for many schools. The COVID-19 pandemic has further highlighted these inequalities, forcing institutions to rapidly adopt distance learning solutions and revealing the need for universal access to technology (Solda, Lanfrey, 2017).

Recent innovations and global trends

In recent years, digital education has seen an acceleration of innovation, influenced by global trends and new technologies. The emergence of e-learning platforms, such as Moodle and Google Classroom, has made online learning more accessible, allowing teachers to create interactive and engaging courses.

Additionally, artificial intelligence (AI) is starting to play a significant role in education, offering opportunities for personalizing learning. AI-based tools can analyze student performance and provide real-time feedback, allowing for a more targeted and individualized approach.

Gamification, or the application of game elements in education, is another growing trend. This methodology stimulates student engagement, making learning more fun and motivating. Furthermore, the use of augmented and virtual reality offers new possibilities for immersive learning experiences, allowing students to explore complex concepts interactively.

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Finally, the growing focus on digital skills and 21st-century skills education is influencing educational practices. Schools are increasingly called upon to prepare students not only to use technology, but also to develop critical skills, such as critical thinking, creativity, and collaboration.

These innovations, combined with the efforts of educational policies, are helping to shape a future in which digital teaching becomes an integral part of the educational experience, promoting more inclusive and accessible learning for all students (Vicenza, 2023).

The National Digital School Plan (PNSD)

Origins, birth, and developments of the Plan

A fundamental pillar for modernizing the Italian education system and making it more effective and efficient in the digital age, with new objectives and projects in constant development, is the **National Digital School Plan (PNSD)**. This Italian government program has as its main objective the digital transformation of the Italian school. It was introduced with Law 107 of 2015, known as "Buona Scuola", but its history developed over time, with different stages and objectives.

The origins:

- **First debates (2007):** We begin to talk about a national plan for the digitalization of schools with the aim of transforming learning environments and promoting digital innovation.
- **First initiatives (2008-2012):** The first experiments and pilot projects are launched to integrate digital technologies into teaching.

The official birth:

- **2015:** The National Digital School Plan is officially presented, with the aim of launching a comprehensive innovation strategy for the Italian school and positioning it in the digital age. This document represents a milestone, as it defines a long-term vision and the concrete actions to be undertaken.

Further developments:

- **In the following years:** The PNSD has evolved and adapted to the new challenges and opportunities offered by technology. Significant funds have been allocated to equip schools with digital tools and to train teaching staff.

What does the PNSD represent?

Introduced by Article 1, paragraphs 56-59, of Law No. 107 of 13 July 2015 and adopted by Decree of the Minister of Education, University and Research No. 851 of 27 October 2016, the **National Digital School Plan** is part of the European strategy for the digitalization of education and aims to train citizens who are competent and aware of the use of digital technologies. This important initiative by the Italian Ministry of Education is intended as a

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planning tool for the digital transformation process of Italian schools, to promote digital innovation by integrating digital technologies into teaching and learning processes, improving the quality of education.

The Plan contributes to the achievement of the objectives of the United Nations 2030 Agenda for Sustainable Development (Goals 4 and 10), of the European Commission's Digital Education Action Plan 2021-2027 and is inspired by the European reference frameworks (DigComp.Org, DigComp.Edu, and DigComp 2.2). It is included in the National Strategy for Digital Skills and integrates the resources provided for by the School Plan 4.0 and by Digital PA 2026. The preparatory document for the updating of the PNSD 5 takes into account the most recent Proposals for Recommendations from the Commission to the European Council: Proposal for a Council recommendation on improving the provision of digital skills in education and training; Strasbourg, 18.4.2023 COM (2023) 206 final 2023/0099 (NLE); Proposal for a Council recommendation on the key enabling factors for successful digital education and training Strasbourg, 18.4.2023 COM (2023) 205 final 2023/0099 (NLE).

The PNSD is engaged in a multi-level strategy along several lines of action which include:

1. **Staff training:** Provide training courses for teachers to develop their digital and methodological skills (80.3% of teachers use digital technologies in teaching on a daily or weekly basis). For this purpose, a network of 8,200 digital animators, 24,000 innovative teachers, 200 teachers with expertise in digital teaching, and the “Future Labs” have been created, and managed by leading schools present in all Italian regions.
2. **Digital infrastructure:** Strengthen the technological infrastructure of schools, ensuring access to high-speed internet and equipping classrooms with digital tools (93.4% of classes are connected to the internet – data from the 2020 Digital School Observatory).
3. **Curriculum and inclusion:** Integrate digital skills into school curricula, promoting the use of technologies for inclusion and improvement of learning (85.5% of schools promote digital citizenship paths).
4. **Innovative laboratories and spaces:** Create innovative learning environments, such as digital laboratories, that promote active and collaborative teaching (present in 81.3% of schools)
5. **Integration of teaching and education in digital legality:** Promote a conscious and responsible use of technologies in forms of education in digital citizenship.
6. **Local projects and initiatives:** Support digital innovation projects at the local level, encouraging collaboration between schools, families, and communities.

The 4 areas of the PNSD

Articulation of the PNDs

The National Digital Plan for Schools is divided into a series of strategic objectives, areas of intervention, and planned activities, aimed at ensuring effective integration of digital technologies in the Italian education system. This structure is designed to address existing challenges and exploit the opportunities offered by digitalization, with the aim of creating an innovative and inclusive learning environment.

More specifically, the PNSD is divided into **4 areas**, within which the **35 actions are included**: Connectivity, Environments and tools, Skills and Contents, Training and Support.



1st area: connectivity

The fundamental condition for the realization of the PNSD is access to the network from the perspective of global connectivity. It will be necessary to guarantee Access to **the network for all schools, the Right to the internet for students, and the Enablement for all to digital teaching.**

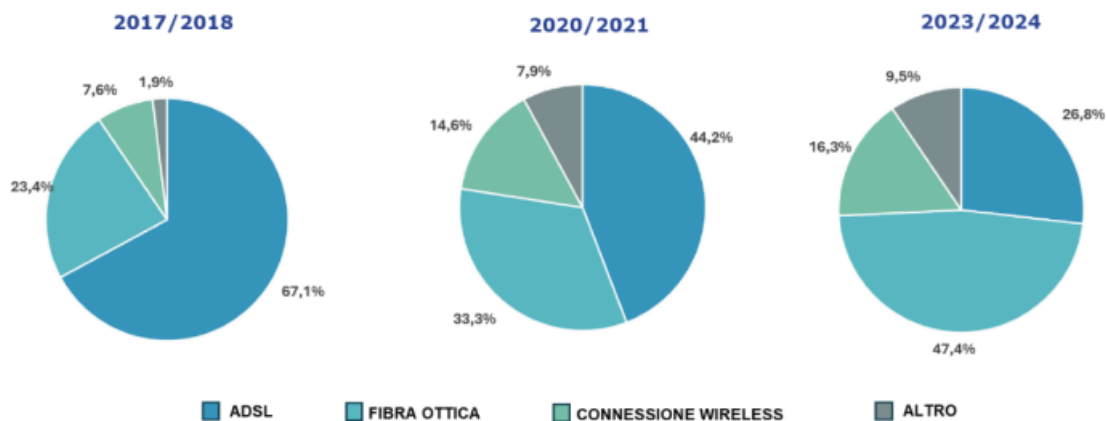
The actions for the realization of this first area are:

- **Action #1: FIBER FOR ULTRA-WIDEBAND** by 2020 the National Ultra-WideBand Plan of the Ministry for Economic Development (MISE) has been developed to bring Broadband to the doors of every school.
- **Action #2: INTERNAL CABLING OF ALL SCHOOLS** for a more effective use of digital equipment; percentage of coverage of the infrastructure network compared to school spaces (classrooms, laboratories, etc.)
- **Action #3: CONNECTIVITY FEE: THE RIGHT TO THE INTERNET** increase in the number of schools fully connected to the Internet; effective improvement of savings in costs for school connectivity, monitoring of the methods of supplying connectivity by schools.



Connettività

Grafico 3 - Tipologie di connessione in alcuni anni presi in esame



REPORT “DIGITAL SCHOOL OBSERVATORY. Observing the changes in progress and monitoring the digital transition process of schools in the 2022/2023 school year”, page 11.

2nd area: environments and tools



For a teaching practice that sees the students as protagonists and that accompanies them throughout their lives, the following are necessary: **digital and innovative school environments, supplies of tools for digital teaching, and laboratories for new professions of the future.**

The actions for the realization of this first area are:

- **Action #4:** creation of **ENVIRONMENTS FOR INTEGRATED DIGITAL TEACHING** and therefore, **CLASSROOMS “AUGMENTED”** by technology, **ALTERNATIVE SPACES** for

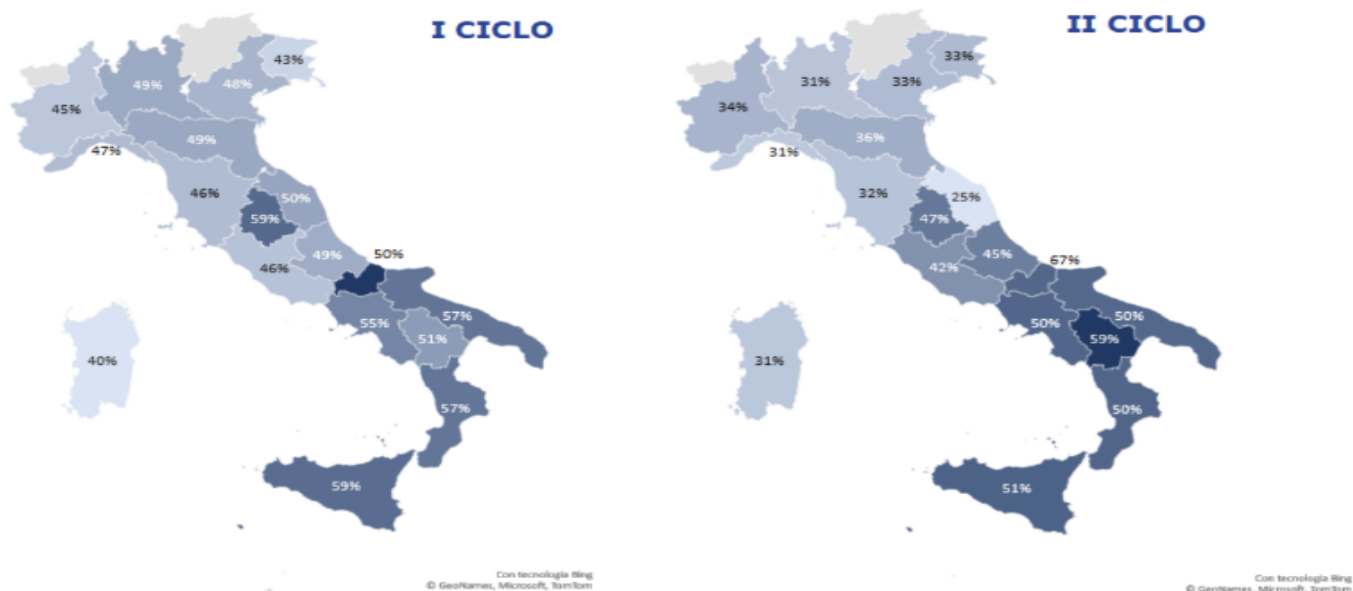
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learning, MOBILE LABORATORIES, mobile devices and tools in trolleys and mobile boxes available to the entire school.

- **Action #5: CHALLENGE PRIZE FOR DIGITAL SCHOOL** or also Digital School Award. Starting from the 2018-2019 school year, in order to promote innovative models and good practices of digital teaching, this award includes a provincial/territorial phase, a regional one, and a national one and is made up of three sections, the first reserved for primary schools, the second for secondary schools, the third for provincial centers for adult education.
- **Action #6: ACTIVE POLICIES FOR BYOD (BRING YOUR OWN DEVICE)** without prejudice to investments in digital environments and the electronic register, specific guidelines are developed to promote this practice by identifying the possible mixed uses of private devices in the plurality of school activities.
- **Action #7: LABORATORIES PLAN - PLAN FOR PRACTICAL LEARNING** investment in the number of laboratories actually strengthened and “certified” in the territory with mapping of the same.
- **Action #8: SINGLE AUTHENTICATION SYSTEM** The creation of a single recognition system with which, by going through a single login page, each user can access all the resources and services to which he is authorized and which are relevant to him.
- **Action #9: DIGITAL STUDENT PROFILE** reconciles policies for the right to study with the digital curriculum for the student.

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Grafico 11 - Distribuzione dell'adozione del Curricolo digitale all'interno del PTOF per regione e per ciclo scolastico



REPORT “DIGITAL SCHOOL OBSERVATORY. Observing the changes in progress and monitoring the digital transition process of schools in the 2022/2023 school year”, page 14.

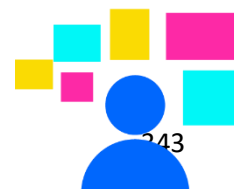
Action #10: A DIGITAL PROFILE FOR EVERY TEACHER training, updating, and cultural and professional growth, will be highlighted: the work in the classroom and at school, therefore the professional portfolio that each teacher develops starting from the probationary year and throughout the career; the wealth of training experiences built through the paths offered by the Ministry or through the teacher's card

Action #11: SCHOOL ADMINISTRATIVE DIGITALIZATION

Action #12: ELECTRONIC REGISTER

Action #13: SCHOOL DATA STRATEGY

3rd area: skills and contents



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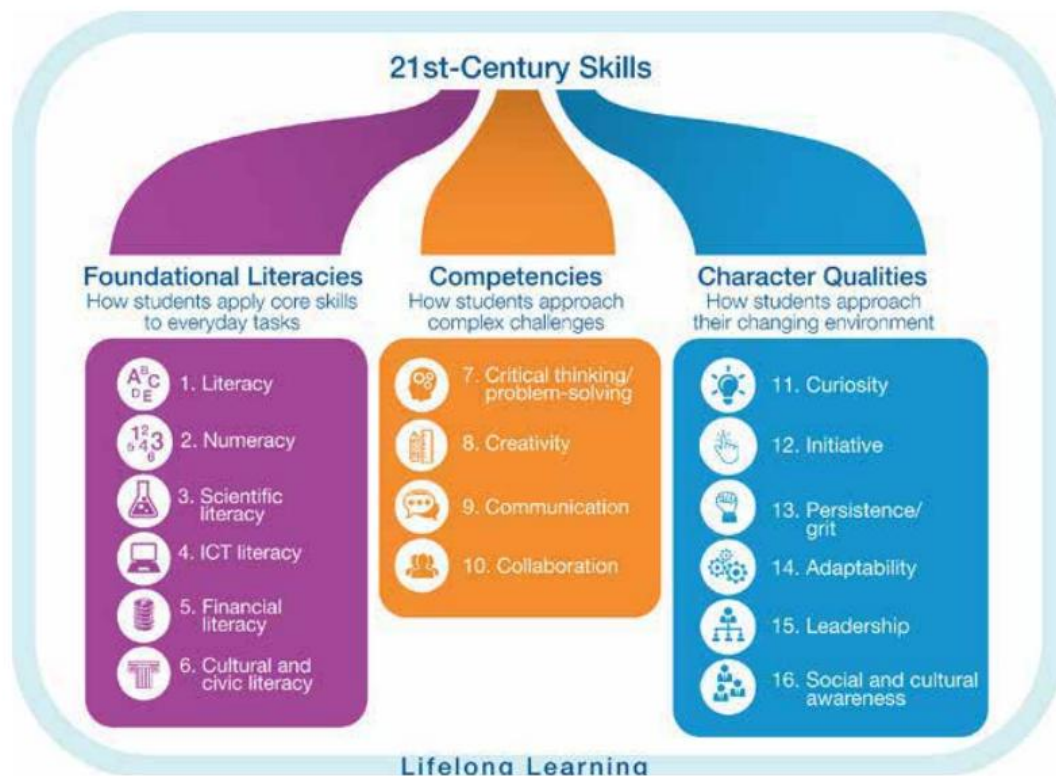
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With the objectives of Defining a common matrix of digital skills, supporting teachers in their role as facilitators of innovative teaching paths, involving students through 'goal-based' formats, and innovating school curricula, the following actions at multiple levels are necessary:

Action #14 – A COMMON FRAMEWORK FOR STUDENTS’ DIGITAL SKILLS.

At the national level, it is necessary to create a reference structure, a set of guidelines that define the essential digital skills that every student should acquire during their school career and that are in harmony with and recall the 8 European key skills.



Fonte: World Economic Forum, New Vision for Education (2013)

Le 8 competenze chiave europee

1. Comunicazione nella madrelingua
2. Comunicazione nelle lingue straniere
3. Competenza matematica e competenze di base in scienza e tecnologia
4. Competenza digitale
5. Imparare ad imparare
6. Competenze sociali e civiche
7. Spirito di iniziativa e imprenditorialità
8. Consapevolezza ed espressione culturale

Action #15 – INNOVATIVE SCENARIOS FOR THE DEVELOPMENT OF APPLIED DIGITAL SKILLS.
Action #16 – A RESEARCH UNIT FOR 21ST CENTURY SKILLS
. Action #17 – BRINGING COMPUTATIONAL THINKING TO ALL PRIMARY SCHOOL.
Action #18 – UPDATING THE “TECHNOLOGY” CURRICULUM IN LOWER SECONDARY SCHOOL.

In order to bring young people closer to scientific careers in the STEAM (science, technology, engineering, arts, and mathematics) field, with particular attention to the gender gap, it is important to proceed with the following actions:

- **Action #19:** A Curriculum for (Digital) Entrepreneurship.
- **Action #20:** Girls in Tech & Science.
- **Action #21:** Digital Careers Plan.

We need to create the right conditions, both technical and accessible, so that digital content, in its growing variety and creativity, can move from the exception to the rule in schools.

- **Action #22:** MINIMUM STANDARDS AND INTEROPERABILITY OF ONLINE ENVIRONMENTS FOR EDUCATION.

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- **Action #23:** PROMOTION OF OPEN EDUCATIONAL RESOURCES (OER) AND GUIDELINES ON SELF-PRODUCTION OF EDUCATIONAL CONTENT.
- **Action #24:** SCHOOL LIBRARIES AS ENVIRONMENTS FOR LITERACY IN THE USE OF DIGITAL INFORMATION RESOURCES.

4th area: accompaniment

To ensure that the introduction of digital technologies in education is not just a technological change, but a profound pedagogical transformation, special attention is paid to accompanying school staff and students in their digitalization journey.



- **Action #25:** IN-SERVICE TRAINING FOR EDUCATIONAL AND ORGANIZATIONAL INNOVATION.
- **Action #26:** STRENGTHEN INITIAL TRAINING ON EDUCATIONAL INNOVATION.
- **Action #27:** TECHNICAL ASSISTANCE FOR FIRST CYCLE SCHOOLS.
- **Action #28:** A DIGITAL ANIMATOR IN EVERY SCHOOL.
- **Action #29:** TERRITORIAL AGREEMENTS.
- **Action #30:** STAKEHOLDERS' CLUB FOR THE DIGITAL SCHOOL.
- **Action #31:** A GALLERY FOR THE COLLECTION OF PRACTICES.
- **Action #32:** GIVE INNOVATIVE NETWORKS A PERMANENT LISTENING.
- **Action #33:** OBSERVATORY FOR THE DIGITAL SCHOOL.

The Observatory, through a questionnaire that schools were invited to fill out via an online function of the SIDI (Education Information System) application, proceeds with both qualitative and quantitative investigations for a longitudinal comparative analysis of the historical trend of the data.

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The questionnaire was structured into eight thematic sections: Personal data, Connectivity, Devices, Teaching and digitalization, administrative digitalization, Collaboration and partnerships, Training, Digitalization, and work.

- **Action #34:** A SCIENTIFIC COMMITTEE TO ALIGN THE PLAN WITH INTERNATIONAL PRACTICES.

- **Action #35:** MONITORING THE ENTIRE FLOOR.

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Funding

How is the PNSD financed?

The sources that have financed and still finance the Project are varied and have evolved over time based on the needs and priorities of the project.

The main ones are:

Law 107/2015 (Buona Scuola): initially allocated part of the funds necessary to start the first actions.

PON "For Schools - skills, and environments for learning" 2014-2020: a national operational program that supported specific projects for the digitalization of schools.

Investment fund for financing digital educational laboratories: specific funds to provide schools with laboratories equipped with the most advanced technologies.

PNRR (National Recovery and Resilience Plan): it allocates further investments for the digitalization of schools, intending to accelerate the digital transition and strengthen students' digital skills.

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The resources for financing this plan are allocated annually and may vary based on government priorities and financial availability. The management and distribution of funds

LE RISORSE DEL PNSD								
	2015	2016	2017	2018	2019	2020	TOT	
Fondi Buona Scuola								
Fondi Buona Scuola - PNSD	90	30	30	30	30	30	240	
Fondi Buona Scuola - Formazione		10	10	10	10	10	50	
Fondi Buona Scuola - Alternanza (icodute)		10	10	10	10	10	50	
PON "Per la Scuola" FESR 2014-2020								
Coblaggio interno (MI)	88,5 sul triennio 2015-2017							88,5
Atelier Creativi per le competenze di base	40 sul triennio 2015-2017							40
Laboratori Professionalizzanti in chiave digitale	140 sul triennio 2015-2017							140
Ambienti per la didattica digitale	140 sul triennio 2015-2017							140
Registro elettronico (scuole primarie)	48 sul triennio 2015-2017							48
PON "Per la Scuola" FESR 2014-2020								
Formazione		25	15	15	15	15	85	
Competenze		20	20	20	20	20	100	
Altri fondi MIUR								
legge 440/97	3	4	4	4	4	4	23	
Piano ICT	15	15	15	15	15	15	90	
							1094,5	

occur through public tenders and require careful planning by schools.

The funds allocated to the PNSD are used to purchase technological equipment, train all school staff, develop digital platforms and tools, and carry out experimental and educational innovation projects.

Areas of excellence and national best practices in the field of school digitalization

Some trends and good practices that are spreading at a national level **can be identified:**

- **Teacher training:**

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- **Customized courses:** Offer modular and customized training courses, based on the specific needs of teachers.
- **Community of Practice:** Creation of virtual and physical spaces for discussion and collaboration between teachers, to share experiences and good practices.
- **Mentoring:** Assignment of expert tutors to support less experienced teachers.
- **Integrating technologies in the classroom:**
 - **Flipped classroom:** Inversion of the traditional frontal lesson, with the use of videos and online materials for individual study at home and in-class activities dedicated to discussion and problem-solving.
 - **Learning by doing:** Projects that involve students in practical and collaborative activities, using digital tools for designing, creating, and sharing results.
 - **Gamification:** Using game elements to make learning more engaging and motivating.
- **Development of digital skills of students:**
 - **Coding:** Introduction to programming from the earliest grades, to develop computational thinking and creativity.
 - **Digital citizenship:** Education for digital citizenship, to promote a conscious and responsible use of technologies.
 - **Robotics Projects:** Using educational robots to stimulate curiosity and problem-solving.
- **Collaboration between school and territory:**
 - **Corporate Partnerships:** Collaborate with companies to provide students with hands-on learning experiences and career guidance.
 - **Coding and robotics projects in collaboration with universities:** Development of joint projects to promote digital culture and innovation.
- **Use of digital platforms:**

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- **Google Workspace for Education:** Use collaborative tools like Google Drive, Google Classroom, and Google Meet to organize classroom work and foster communication.
- **Microsoft 365 Education:** Using tools like Teams, OneNote, and Office 365 for collaboration and content creation.
- **LMS (Learning Management System) Platforms:** Use of platforms for managing online learning, such as Moodle or Canvas (<https://scuoladigitale.istruzione.it/>).

The PNSD in ISA13

Local reality

Our Institute has also been affected by digitalization.

- EACH BUILDING HAS BEEN REACHED BY ULTRA-BROADBAND FIBER, WITH INTERNAL CABLING AND INTERNET ACCESS.
- TEACHING AND NON-TEACHING STAFF, STUDENTS, AND FAMILIES ARE CONTINUOUSLY TRAINING FOR AN EVER MORE APPROPRIATE USE OF TECHNOLOGY.
- For example:

All teachers of the three school levels use the electronic register to record their work, to plan it for students and, also, for timely, functional, and effective communication with the administration and families.



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- Students and teachers use G Suite for Education in schools, enabling teachers and students to create and grow together, both in person and remotely.



- In the Institute there are 3 **DIGITAL ANIMATORS** who accompany all the school actors on a daily basis in their digitalization experience.

What is a Digital Animator in the context of the PNRR?

The Digital Animator, within the National Recovery and Resilience Plan (PNRR), is a professional figure who has the task of **supporting the school in the digital transition**. His role is fundamental for:

- **Train school staff:** Help teachers and ATA acquire the digital skills needed to effectively use new technologies in the classroom.

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- **Integrating technology into teaching:** Design and implement innovative teaching activities that exploit the potential of digital tools.
- **Promote active student participation:** Involve students in learning processes through the use of digital platforms and tools.
- **Developing digital culture in schools:** Creating a school environment that is conducive to innovation and the conscious use of technologies.

What are the main activities of a Digital Animator?

The activities of a Digital Animator can vary depending on the specific needs of each school, but in general they include:

- **Training:** Organization of courses and workshops for teachers and ATA.
- **Tutoring:** Individual support for teachers in using digital tools.
- **Design:** Creation of innovative educational projects.
- **Development of digital teaching materials:** Creation of presentations, videos, interactive exercises, and more.
- **Management of digital platforms:** Configuration and management of platforms and tools for distance and in-person teaching.
- **Collaboration with other professionals:** Work in teams with school principals, teachers, technicians, and other industry experts.

Why is the figure of the Digital Animator so important?

The figure of the Digital Animator is fundamental for:

- **Bridging the digital divide:** Ensuring all students have equal access to new technologies.
- **Improving the quality of teaching and learning:** Making teaching more effective and engaging.
- **Preparing students for the challenges of the future:** Providing students with the digital skills needed to live and work in the digital society.

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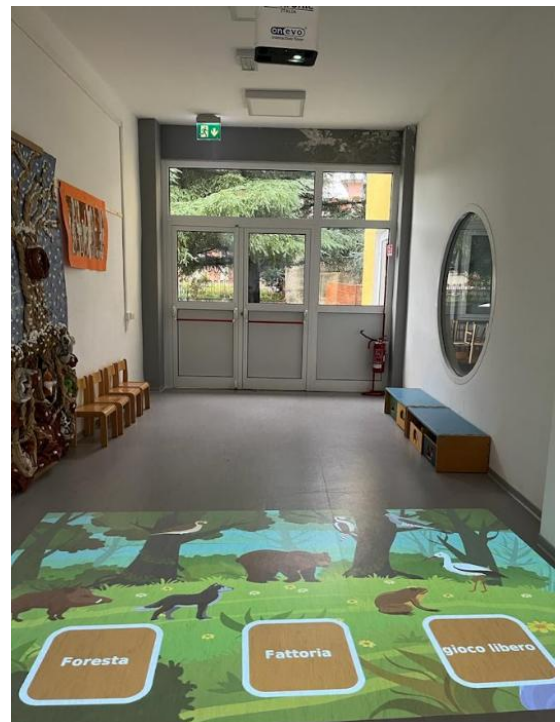
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- **THE ENVIRONMENTS** HAVE BEEN RENEWED BY WELCOMING DIGITAL TOOLS AND THUS BECOMING REAL LABORATORIES FOR LEARNING LIFE SKILLS.

For example, in the Lalli Nursery School, belonging to ISA 13, thanks to a call for a PON for the creation of “INNOVATIVE ENVIRONMENTS FOR CHILDHOOD”, won in the 2022-2023 school year, it was possible to set up new spaces for educational laboratories.



- **TEACHING**, WHICH BY INTEGRATING DIGITAL ASPECTS, IS ABLE TO RESPOND MORE TO NEEDS SUCH AS PERSONALIZATION OF LEARNING, AUTONOMY, COLLABORATION AND THE ACHIEVEMENT OF DIGITAL SKILLS (<https://scuoladigitale.istruzione.it/>).

Teacher training

Importance of continuous training

Teacher training is a crucial element for the success of the National Digital Plan. Without adequate preparation, educators cannot fully exploit the potential of digital technologies in teaching. This section will explore the importance of continuous training, the training and refresher programs available, and the digital skills needed for teachers.

Continuous teacher training is essential to ensure that teaching practices are always up to date and in line with the needs of the contemporary world. The rapid evolution of digital technologies requires educators to constantly adapt and learn new methodologies and tools.

Adapting to change is essential, as digital technologies evolve rapidly and teachers must be able to integrate these innovations into the curriculum. Ongoing training provides educators with the skills needed to use new resources and tools in the classroom.

In addition, continuous training helps improve the quality of teaching. Teachers learn innovative teaching methodologies and strategies to engage students, which leads to more effective and stimulating learning.

Another important aspect is the support for inclusive teaching. Adequate training allows teachers to address the challenges related to inclusion, providing them with tools and strategies to support all students, including those with special educational needs.

Continuing education therefore represents an opportunity for teachers to develop their professional careers, acquiring new skills and knowledge that can open up new job opportunities and professional development (Caffo, Di Maria, 2020).

Training and refresher programs

To ensure effective training, it is essential to develop training and refresher programs that respond to the needs of teachers and the challenges of the current educational context. Training courses for new teachers must include a solid foundation of digital skills so that they can enter the world of teaching already prepared to face the challenges of digital teaching.

Organizing workshops and seminars on specific topics related to digital technologies is another useful strategy. Events like these, which deal with the use of educational software, online learning platforms, and innovative teaching methodologies, offer teachers the opportunity to learn from experts and share experiences.

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Additionally, developing accessible online training courses allows teachers to learn flexibly and at their own pace. E-learning platforms can offer modules on a variety of topics, from designing digital activities to using collaborative tools.

Creating mentoring programs is another valid approach, where experienced teachers can support less experienced colleagues in their training and professional growth. This method promotes the sharing of best practices and the creation of a learning community.

Finally, facilitating the creation of communities of practice among teachers allows them to collaborate, exchange ideas and resources, and jointly address the challenges related to the integration of digital technologies (Boccia Artieri, Pavan, 2020).

Digital skills for teachers

Digital skills are essential for teachers who want to successfully integrate digital technologies into their teaching. These skills are divided into several key areas.

First, technical skills are essential, as teachers need to be proficient with digital tools and technologies, including educational software, e-learning platforms, and online collaboration tools. Being able to use these tools effectively is crucial for lesson planning and implementation.

In addition, teachers need to develop pedagogical skills, and understand how to integrate digital technologies into their teaching practices. They must be able to adapt teaching methodologies to the needs of students and use technologies to facilitate active and collaborative learning.

Digital classroom management skills are equally important. Teachers must be able to engage students, monitor their online interactions, and manage challenging behavior in a virtual environment.

Furthermore, the ability to use digital tools to assess student performance is essential. Teachers must be able to design and implement digital assessments, providing timely and meaningful feedback.

Finally, it is crucial that teachers recognize the need to update their skills and seek out opportunities for continuing education. Being proactive in their professional development is essential to keeping pace with the changes in the educational landscape.

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In summary, teacher training is a crucial element for the success of the National Digital Plan. Investing in continuous training, developing refresher programs, and promoting adequate digital skills will ensure that educators are ready to make the most of the opportunities offered by digital technologies, contributing to high-quality and inclusive education for all students (Ranieri, 2022).

Inclusion and accessibility

Challenges of digital inclusion

Inclusion and accessibility are key principles to ensure that all students can benefit from the opportunities offered by digitalization in education. It is essential to address the challenges related to digital inclusion and develop strategies to ensure equitable access to resources and technologies.

Digital inclusion is a significant challenge in the implementation of the National Digital Plan. Various barriers can hinder equitable access to technologies and educational resources. The digital divide is a major issue, as socioeconomic inequalities can affect access to technological devices and high-quality Internet connections. Students from low-income families may have difficulty participating in digital learning experiences.

Another aspect to consider is that not all students have the same digital skills. Some may not be familiar with the use of technologies and online resources, limiting their ability to learn in a digital environment. Additionally, accessibility of resources is crucial; digital resources are not always designed with the needs of all students in mind. Inaccessible materials may exclude students with visual, hearing, or cognitive disabilities, preventing them from fully participating in learning.

We can say that school culture plays an important role. In some schools, educational practices and the environment may not be sufficiently inclusive. The absence of a stimulating and welcoming context can limit the participation of students with different needs (Fabiano, 2021).

Strategies to ensure equitable access

To address the challenges of digital inclusion, it is essential to develop targeted strategies that ensure equitable access to technologies and educational resources. It is essential to

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invest in technological infrastructure, ensuring that all schools have access to fast Internet and adequate devices. This approach will help reduce the digital divide between schools and communities.

Another effective strategy is to create programs that allow students to borrow technology devices, such as laptops and tablets, to ensure that everyone can access digital resources, regardless of their economic situation. It is equally important to provide training for students and families on basic digital skills and technology use, as these courses can help bridge the skills gap and make digital learning more accessible.

Additionally, establishing partnerships with local governments, nonprofits, and businesses is a critical step in promoting initiatives that foster access to technology and educational resources in underserved communities. Finally, it is crucial to promote school policies that encourage an inclusive and welcoming environment. This may include staff training on diversity and inclusion, as well as creating individualized plans for students with special needs (Fabiano, 2021).

Resources for students with special needs

To ensure that students with special needs can access digital educational resources, it is essential to develop and provide specific resources. It is important to provide tools and assistive technologies, such as reading software for students with visual impairments or communication devices for those with verbal difficulties. These tools can facilitate access to digital learning.

Furthermore, it is essential to ensure that digital learning materials are designed to be accessible to all students. This may include the use of alternative formats, such as large texts, subtitles for videos, and audio explanations so that everyone can benefit from the resources. Another important aspect is the provision of individualized support to students with special needs, through the assignment of tutors or educational assistants who can help them navigate the digital world and use the resources effectively.

It is also helpful to implement awareness programs in schools to educate students and staff about diversity and the importance of inclusion. Promoting a culture of respect and acceptance is essential to creating a welcoming environment.

Creating support networks between teachers, families, and specialists can facilitate the sharing of effective resources and strategies for educating students with special needs. This collaborative approach can significantly improve access and learning.

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Inclusion and accessibility are key aspects of the success of the National Digital Plan. Addressing the challenges related to digital inclusion and implementing strategies to ensure equitable access to educational resources will help create a more inclusive and fair learning environment for all students, regardless of their needs (Agostini et al, 2024).

ICT in the Italian Educational System

The teaching of ICT in Primary Education

As stated by the Council of the European Union in the text "Council Recommendation on key competencies for lifelong learning", digital competence presupposes an interest in digital technologies and their use with familiarity and a critical and responsible spirit to learn, work and participate in society. It includes computer and digital literacy, communication and collaboration, media literacy, digital content creation (including programming), security (including being comfortable in the digital world and possessing cybersecurity skills), intellectual property issues, problem-solving, and critical thinking.

Subjects/courses that include the teaching of ICT

Technology envisaged by the new national guidelines is a discipline that is placed, in a TRANSVERSE manner in the primary school curriculum. Many skills can also be developed in other disciplines such as Science, Mathematics, Geography, etc. The new indications specify the skills at the end of the fifth grade of primary school, reaffirming the transversal value of the discipline.

ICT in the curriculum

Skills

- Consciously use the most common technologies, knowing the basic principles, especially in reference to domestic systems.
- Use simple digital learning materials.
- Use the PC, some peripherals, and application programs.
- Introduction to the knowledge of the Net for information, communication, research, and leisure purposes.
- Identify physical risks in the use of electrical and electronic equipment and possible preventive behaviors.
- Identify the risks of using the Internet and identify some preventive and corrective behaviors.

Knowledge

- Simple daily technological applications and related operating modes.
- The main computer input and output devices.
- The main application software useful for the study, with particular reference to word processing, presentations, and educational games.
- Simple procedures for using the Internet to obtain data, research, and communicate.
- Physical risks in using electrical and electronic appliances.
- Risks in using the network with PCs and smartphones.

ICT in the Teaching of Cultural Heritage

The use of technologies for educational purposes, the so-called Edutainment (a word born from the crasis of the two English-speaking terms Education and Entertainment) has a strong paideutic vocation, addressing a particular type of users, generally of school age. So, the technologies in this case serve as a facilitated means to lead the student to take a path towards the acquisition of knowledge/skills on a particular theme or topic. The educational path that is set up provides, based on a procedure typical of the playful environment, a series of sequential steps that, once passed, lead to the achievement of an educational goal.

As a reaction to the pandemic, many Italian museums have created virtual tours that schools can take part in online. The visits are organized as real visits in presence with also the possibility of carrying out workshops. In addition to these special educational trips, many works of art have been digitized and uploaded to a database to give greater opportunities for the dissemination and use of cultural heritage [175].

Conclusions

The digitalization of education represents a fundamental transformation in the Italian educational landscape, with the aim of preparing students for the challenges of the future and promoting inclusive and quality learning. In this section, we will summarize the key points discussed, share some personal reflections, and propose recommendations for the future.

Summary of key points

- **Teacher training:** Continuous training is crucial to ensure that educators are equipped with the digital skills needed to effectively integrate technologies into teaching.
- **Inclusion and accessibility:** It is essential to address the challenges related to the digital divide and ensure that all students have equitable access to resources and technologies, promoting inclusive education.
- **Innovative teaching methodologies:** The adoption of methodologies such as active learning, flipped classroom, and blended learning, together with the use of digital tools, can improve the effectiveness of teaching and engage students more.
- **Evaluation and monitoring:** Evaluating the effectiveness of digital initiatives and using success indicators are essential to ensure that educational objectives are achieved and to make continuous improvements.
- **Challenges and opportunities:** While there are significant challenges in implementing technologies, such as the digital divide and resistance to change, there are also opportunities that can transform education, such as global access to resources and personalization of learning.

Personal reflections

Reflecting on the importance of digitalization in education, it is clear that the integration of technologies is not just a matter of access to tools, but represents a profound change in the way students learn and interact with the world. Digital education offers the possibility of creating more dynamic and collaborative learning environments, where students can explore, discover, and connect with global resources. However, this journey requires a

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collective commitment from all stakeholders – teachers, students, families, and institutions
– to ensure that every student can fully benefit from the opportunities offered.

Recommendations for the future

1. Investment in infrastructure: It is essential to ensure that all schools have access to modern technologies and high-quality Internet, to reduce the digital divide and ensure equitable access to educational resources.
2. Continuous training: Promote training and refresher programs for teachers, so that they can develop digital skills and innovative teaching methodologies. Training should be flexible and accessible, to meet the needs of educators.
3. Foster collaboration: Create collaborative networks between schools, universities, local authorities, and companies to share resources, experiences, and best practices. This synergy can lead to more effective and sustainable solutions.
4. Develop inclusive policies: Implement educational policies that promote inclusion and accessibility for all students, taking into account different needs and socio-economic backgrounds.
5. Regular monitoring and evaluation: Establish monitoring and evaluation systems to measure the effectiveness of digital initiatives and collect feedback from teachers and students, in order to make continuous improvements and ensure quality education.
6. In conclusion, the future of digital education in Italy is promising, but it requires constant and collaborative commitment from all. By addressing the challenges and seizing the opportunities, we can build an education system that not only prepares students for the world of work but also shapes them as informed and engaged citizens, ready to contribute to an ever-changing society.

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Sitography

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- <https://www.miur.gov.it/scuola-digitale>

3.3. The Case of Finland

Information and communication technology competence (ICT)

Information and communication technology (ICT) competence is an important civic skill both in itself and as part of multiliteracy. It is both the subject of learning and a tool. In basic education, care is taken to ensure that all students have opportunities to develop ICT competence. Information and communication technology is systematically utilized in all grades of basic education, in different subjects and multidisciplinary learning modules, as well as in other schoolwork.

ICT competence is developed in four main areas: 1) Students are guided to understand the principles of using information and communication technology and key concepts, as well as to develop their practical ICT skills in creating their own products. 2) Students are guided to use information and communication technology responsibly, safely, and ergonomically. 3) Students are taught to use information and communication technology in information management and investigative and creative work. 4) Students gain experience and practice using ICT in interaction and networking. In all these areas, students' own activity and the opportunity for creativity, as well as finding suitable working methods and learning paths for themselves, are important.

Also important is the joy of collaboration and insight, which affects study motivation. Information and communication technology provides tools to make one's thoughts and ideas visible in many different ways and thus also develop thinking and learning skills.

Students are guided to know the different applications and purposes of ICT and to understand their significance in everyday life, in interpersonal interaction, and as a means of influence. Together, they reflect on why ICT is needed in studying, working, and in society, and how these skills have become part of general employability skills. The impact of information and communication technology is learned to be assessed from the perspective of sustainable development and to act as responsible consumers.

During basic education, students also gain experience in using ICT in international interaction. They learn to perceive its importance, opportunities, and risks in the global world.

Grades 1-2

Instruction builds upon the knowledge and skills in information and communication technology (ICT) acquired during preschool and outside of school. Play-based learning

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remains central. Basic ICT skills are practiced, and students learn to use them as tools for studying. At the same time, they learn key concepts. Students also reflect on the purposes of using ICT in their immediate environment and its significance in everyday life. Practical skills and content creation: In schoolwork, students practice using devices, software, and services, and learn their basic operating principles. They also practice keyboarding skills and other basic skills for producing and processing text. Students share experiences of working with digital media and engage in age-appropriate programming. Gamification is utilized as a promoter of learning. Responsible and safe behavior: Students discuss and collaboratively establish safe and responsible ways of using ICT. Attention is paid to healthy work postures and the importance of suitable work periods for well-being. Information management and investigative and creative work: Students are guided to use key search services, try out different tools, and carry out small-scale information-gathering tasks on various topics and subjects of interest to them. They are encouraged to implement their ideas using ICT alone and with others. Interaction and networking: Students gain experience in using community services that support learning and practice using ICT in various interactive situations.

Grades 3-6

Information and communication technology (ICT) is utilized extensively across different subjects and other school activities, enhancing collaborative learning. At the same time, students are provided with opportunities to seek, experiment with, and use the most suitable methods and tools for their learning and work. The school explores the impact of ICT on everyday life and investigates sustainable usage practices.

Practical skills and content creation: Students learn to use various devices, software, and services, understanding their operational logic. They develop proficiency in producing and processing text using different tools and also learn to create images, audio, video, and animations. Students are encouraged to implement their ideas using ICT alone and with others. Through experimenting with programming, students gain insights into how technology's functioning depends on human-made solutions.

Responsible and safe behavior: Students are guided towards responsible and safe use of ICT, good manners, and basic principles of copyright. In schoolwork, they practice using different communication systems and community services for educational purposes. Students receive information and experience regarding the importance of good posture and suitable work intervals for health.

Information management and investigative and creative work: Students practice searching for information from multiple sources using search engines. They are guided to utilize sources in producing their own knowledge and practice critical evaluation of information.

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Students are encouraged to find suitable forms of expression for themselves and use ICT for documenting and evaluating their work.

Interaction and networking: Students are guided to act according to their roles and the nature of the medium and to take responsibility for their communication. They are guided to examine and evaluate the role of ICT as a means of influence. Students gain experience in using ICT for interaction with external stakeholders, including international contexts.

Grades 7-9

Information and communication technology (ICT) usage is a natural part of students' individual and communal learning experiences. Students deepen their skills and apply what they have learned outside of school in their studies. They develop an understanding of how ICT can be utilized across different subjects, in further studies, in the workforce, and in societal engagement and advocacy. Within learning tasks, the significance of ICT in society and its impact on sustainable development are examined.

Practical skills and content creation: Students are encouraged to independently utilize ICT in various learning tasks and to choose suitable methods and tools for different assignments. Their understanding of the operation logic of various devices, software, and services deepens. They become adept at organizing, sharing files, and creating various digital products independently and collaboratively. Programming is practiced as part of studies in different subjects.

Responsible and safe behavior: Students are guided towards safe and ethically sustainable use of ICT. They learn how to protect themselves from potential cybersecurity risks and avoid data loss. Responsible behavior is encouraged through reflection on concepts such as data protection and copyright, and the potential consequences of irresponsible and unlawful actions. Students are instructed to adopt healthy and ergonomic work practices.

Information management and investigative and creative work: Students are guided towards diverse information gathering and production, utilizing various sources for investigative and creative work. They also practice source criticism and learn to evaluate their own and others' ways of working and producing information, including different search engines and databases.

Interaction and networking: Collaborative services are utilized in teaching, emphasizing the importance of collaboration and interaction in learning, investigative work, and innovation. Students are taught to use various communication channels and styles appropriately. They practice utilizing ICT in international interactions and learn to understand its significance, opportunities, and risks in a global context.

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<https://www.oph.fi/sites/default/files/documents/perusopetuksen_opetussuunnitelman_perusteet_2014.pdf> [accessed 20 April 2024]

Learning also takes place outside of school and with the help of technology

The curriculum guidelines have developed descriptions of learning environments and methods, especially for Primary School. The learning environment should be safe and inspire learning. When developing learning environments, the specific characteristics of different subjects are taken into account. In addition to the classroom, external environments and spaces outside of school are increasingly used as learning environments: students explore nature and visit, for example, museums or companies.

Digital environments are also part of learning environments. Varied teaching methods are used in the instruction of each subject so that students also learn various skills along the way. The use of technology is becoming increasingly important in the everyday life of schools, and students are involved in developing and choosing their own learning environments.

Various teaching methods are used in basic education. The selection of teaching methods is guided by the objectives set for teaching and learning, as well as the needs and interests of the students. When choosing teaching methods, the specific characteristics of different subjects and the promotion of comprehensive competence are also taken into account. The use of information and communication technology also promotes students' opportunities to develop their work and learn the skills needed in the future.

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Interaction and versatile work

Interaction, collaboration, and versatile work are factors that promote learning and well-being for all members of the community. A learning community recognizes the diversity of learning and knowledge construction and acts flexibly. It encourages experimentation and provides space for the characteristic functionality, creative work, movement, play, and experiences of different age groups and learners.

In schoolwork, various methods and learning environments are systematically utilized, and efforts are made to regularly take the work outside the classroom. Opportunities are created for project-based work and the study of wholes, as well as for collaboration within the school and with external stakeholders. The mutual collaboration of school adults and

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interaction with the surrounding society support students' growth in good interaction and collaboration.

Collaborative work promotes the recognition of one's own uniqueness and the ability to work constructively with a variety of people. Information and communication technology is used to promote interaction as well as the multisensory and multi-channel nature of work.

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Learning Environments

Learning environments refer to spaces and places as well as communities and practices where studying and learning take place. They also include tools, services, and materials used in studying. Learning environments should support the growth, learning, and interaction of individuals and communities. All members of the community influence learning environments with their actions. Well-functioning learning environments promote interaction, participation, and communal knowledge construction. They also enable active collaboration with communities outside of school or with experts. The goal of developing learning environments is to create a pedagogically diverse and flexible whole. Different subject-specific needs are taken into account in development. Learning environments should provide opportunities for creative solutions as well as for examining and researching things from different perspectives. Additionally, in developing and selecting learning environments, it is recognized that students learn new information and skills outside of school as well.

Information and communication technology is an essential part of versatile learning environments. It enhances students' participation and collaborative work skills and supports their personal learning paths. The development of learning environments takes into account the diverse media culture. New information and communication technology solutions are introduced to promote and support learning. Students' own information technology devices can be used to support learning in ways agreed upon with guardians. At the same time, it is ensured that all students have access to information and communication technology.

Experiences of success and enjoyment in different environments and learning situations inspire students to develop their own competence. Students participate in the development of learning environments. Individual needs of students are taken into account in the design

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of learning environments. This can help prevent the need for learning and schooling support. Learning environments tailored to support needs may be part of planned support for students as needed.

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Teaching Methods

The selection of teaching methods is based on the objectives set for teaching and learning, as well as on the needs, conditions, and interests of the students. Varying teaching methods support and guide the learning of the entire teaching group and each student. Different teaching methods suitable for different age groups and learning situations are used in teaching. The diversity of teaching methods and assessment methods allows students to demonstrate their skills in different ways. Attention is also paid to recognizing and changing gendered attitudes and practices in the selection of teaching methods. Diverse teaching methods bring joy and experiences of success to learning and support the creative activities characteristic of different age groups. Experiential and active teaching methods, as well as the use of different senses and movements, enhance the experiential nature of learning and strengthen motivation. Teaching methods that support autonomy and a sense of belonging to the group also enhance motivation.

The selection of teaching methods takes into account the characteristics of different subjects as well as the development of comprehensive competence. The use of teaching methods specific to each subject promotes the formation of structured knowledge and the acquisition of skills. Important for learning are skills in acquiring, processing, analyzing, presenting, applying, combining, evaluating, and creating information. Investigative and problem-based work, play, imagination, and artistic activities promote conceptual and methodological competence, critical and creative thinking, and the ability to apply skills.

Versatile and appropriate use of information and communication technology increases students' opportunities to develop their work and networking skills. Thus, readiness for independent, interactive, and critical acquisition, processing, and creative production of information is enhanced. The selection of teaching methods utilizes the opportunities offered by games and gamification.

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Considering Students' Age and Abilities, and Diverse Assessment Practices

Assessment practices and giving feedback should be planned and implemented according to the age and abilities of the students. When giving feedback, attention is paid to students' successes and progress in relation to their previous knowledge.

Diverse methods are used in assessment. Teachers gather information about students' progress in various learning areas and situations. It is important to consider students' different ways of learning and working and to ensure that there are no barriers to demonstrating progress and competence. In various assessment and demonstration situations, it is ensured that each student understands the task and has enough time to complete it. Additionally, opportunities to use information and communication technology if needed and to give oral presentations are provided. Availability of any assistive devices that students may need and necessary support services are also ensured. Even mild learning difficulties and students' potentially limited proficiency in the language of instruction/Finnish language/Swedish language should be taken into account when planning and implementing assessment and demonstration situations. Similarly, any specific emphasis areas defined for students' learning are taken into account.

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Instruction Organized by Functional Areas

For students with severe developmental disabilities, instruction can be organized by functional areas instead of subject divisions. Similarly, for a student with disabilities or serious illnesses, instruction may be organized by functional areas due to the student's health condition. The decision to organize instruction by functional areas instead of subject divisions is made in the decision on special support. Instruction is organized by functional areas only when it is determined that the student is unable to study even individualized learning objectives in subjects. The functional areas include motor skills, language and

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communication, social skills, daily living skills, and cognitive skills. The goal of instruction organized by functional areas is to provide the student with knowledge and skills to enable them to function as independently as possible in their life. The starting point for planning instruction is the student's strengths. Learning is integrated into different situations throughout the school day, and the learning environment is developed to be functional and motivating for the student. Goals are set to be achievable and meaningful for the student. The functional areas may include objectives and content of a specific subject if the student has strengths in that subject. In the implementation of instruction, the contents of different functional areas can be integrated. Instruction organized by functional areas supports the student's overall development and promotes and maintains the student's functional capacity. Instruction is planned and implemented in collaboration with the student and the guardian. In addition, collaboration is carried out between teachers, other staff, and various experts.

Instruction should include areas covering health and safety, daily life skills, housing and mobility in the environment, and leisure activities. Practicing daily skills provides opportunities for the development and practice of motor skills, language and communication, information and communication technology skills, social skills, and cognitive skills, which in turn strengthen the mastery of daily skills.

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4. Integration of Technology in Primary Schools

4.1. Integration of Technology as a concept

Technology in schools refers to the deliberate and strategic incorporation of various digital tools, resources, and methodologies into the educational environment to enhance teaching and learning processes. This integration aims to leverage technology's capabilities to improve educational outcomes, foster student engagement, and prepare students for success in a digital world. Integrating technology in primary schools can greatly enhance learning experiences and prepare students for the digital world.

Key Aspects of Technology Integration in Schools

Here are several key aspects to consider when implementing technology in primary education:

1. **Curriculum Enhancement:** Technology is used to enrich and expand the curriculum, providing opportunities for interactive learning experiences that go beyond traditional methods. This includes integrating digital content, multimedia resources, simulations, and virtual labs to make learning more dynamic and relevant.
2. **Pedagogical Transformation:** Technology transforms teaching practices by enabling educators to adopt student-centered and inquiry-based approaches. Teachers can use digital tools for differentiated instruction, personalized learning paths, and real-time assessment, catering to diverse learning needs and styles.
3. **Student Engagement and Motivation:** Interactive and multimedia elements in educational technology capture students' interest and motivation, making learning more enjoyable and meaningful. Gamification, virtual reality, and collaborative online platforms are examples of tools that enhance engagement.
4. **Skill Development:** Technology integration fosters the development of critical 21st-century skills such as digital literacy, collaboration, creativity, critical thinking, and problem-solving. These skills are essential for students to thrive in a knowledge-based economy.
5. **Access to Information and Resources:** Digital resources and online databases provide students and educators with access to a vast amount of up-to-date information, academic resources, e-books, and educational tools. This enhances research capabilities and supports lifelong learning.
6. **Collaboration and Communication:** Technology facilitates communication and collaboration among students, teachers, parents, and communities. Online platforms,

video conferencing, and social media tools enable seamless communication, sharing of ideas, and global collaboration on projects.

7. **Assessment and Feedback:** Digital assessment tools allow for timely and formative feedback, enabling teachers to monitor student progress more effectively. Automated grading, quizzes, interactive assessments, and data analytics help personalize learning experiences and track outcomes.
8. **Professional Development:** Technology integration requires ongoing professional development for educators to stay updated with new tools, methodologies, and best practices. Professional learning communities, workshops, and online courses support teachers in effectively integrating technology into their teaching practice.
9. **Infrastructure and Support:** Schools need robust infrastructure, including reliable internet connectivity, adequate devices (laptops, tablets, etc.), and technical support to ensure smooth integration and usage of technology tools in classrooms.
10. **Ethical and Responsible Use:** Technology integration promotes digital citizenship, educating students about responsible and ethical use of technology, online safety, cybersecurity, and respecting intellectual property rights.

Benefits of Technology Integration in Schools:

Integrating technology into primary school education offers numerous benefits that can significantly enhance the learning experience for young students. These advantages include:

Enhanced Engagement and Motivation

- **Interactive Learning:** Technology provides interactive tools such as educational games, simulations, and multimedia presentations that make learning more engaging and fun.
- **Immediate Feedback:** Digital platforms often provide instant feedback, helping students understand concepts more quickly and keep them motivated to continue learning.

Personalized Learning

- **Adaptive Learning Software:** Programs that adjust the difficulty of tasks based on the student’s performance allow for a customized learning experience that can cater to individual strengths and weaknesses.
- **Pacing:** Students can learn at their own pace, revisiting material as needed or advancing more quickly through content they find easier.

Improved Collaboration and Communication

- **Collaborative Tools:** Technology enables students to work together on projects using digital platforms, fostering teamwork and communication skills.
- **Teacher-student interaction:** Digital tools facilitate more efficient communication between teachers and students, allowing for better support and feedback.

Access to Diverse Resources

- **E-books and Online Libraries:** Students have access to a vast array of books, articles, and other learning materials online, broadening their knowledge base.
- **Multimedia Content:** Videos, podcasts, and interactive simulations can cater to different learning styles and make complex topics easier to understand.

Development of Digital Literacy

- **Technical Skills:** Early exposure to technology helps students develop essential digital skills that are critical in the modern world.
- **Online Safety:** Students learn about digital citizenship and online safety, preparing them to navigate the internet responsibly.

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Preparation for Future Education and Careers

- STEM Education: Technology integration supports STEM (Science, Technology, Engineering, and Mathematics) education, which is crucial for future job markets.
- Problem-Solving Skills: Many technological tools and applications require students to use critical thinking and problem-solving skills.

Efficient Assessment and Progress Tracking

- Digital Assessments: Online quizzes and tests can be graded automatically, providing immediate results and helping teachers identify areas where students need more support.
- Data Analytics: Teachers can use data analytics from educational software to track student progress and tailor instruction to meet their needs.

Increased Inclusivity

- Assistive Technology: Tools such as text-to-speech, speech-to-text, and other assistive technologies help students with disabilities access and engage with educational content.
- Language Support: Translation and language learning apps can assist students who are non-native speakers, helping them keep up with their peers.

By thoughtfully integrating technology into primary education with these considerations in mind, schools can create an enriched learning environment that prepares students for future academic and professional challenges in the digital age.

In summary, integrating technology into primary school education enriches learning experiences, equips students with essential skills for the future workforce, fosters collaboration and creativity, and supports personalized and inclusive learning environments. It prepares students to thrive in a digital age where technological literacy is increasingly crucial.

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Technology Tools

In primary schools, various technology tools are commonly used to enhance the educational experience. These tools support learning, teaching, and administrative tasks, contributing to a more interactive and efficient educational environment. Here are some of the most common technology tools used in primary schools:

Basic Computer Skills

- **Operating Systems:** Introduction to navigating and using user-friendly operating systems like Windows or Linux.
- **File Management:** Learning to organize files and folders, create and save documents, and manage digital resources.

Word Processing and Presentation Software

- **Microsoft Word:** Basics of word processing for creating and formatting text documents. Microsoft Word is a widely used word-processing software developed by Microsoft. It is part of the Microsoft Office suite of productivity applications and is designed to help users create, edit, format, and share text documents. Microsoft Word is available as a desktop application for Windows and Mac, as well as a web-based version accessible through a browser, and mobile apps for Android and iOS. This versatility makes it a powerful tool for a wide range of document-related tasks in both personal and professional settings.
- **Microsoft PowerPoint:** Introduction to creating simple presentations with text, images, and basic animations. Microsoft PowerPoint is a presentation software developed by Microsoft. It is part of the Microsoft Office suite and is designed to help users create, edit, and present slideshows composed of a series of individual slides. Each slide can contain a variety of elements such as text, images, charts, animations, and multimedia. Microsoft PowerPoint is available as a desktop application for Windows and Mac, as well as a web-based version accessible through a browser, and mobile apps for Android and iOS. Its robust set of features makes it a powerful tool for creating and delivering engaging presentations for educational, professional, and personal use.

Educational Games and Learning Apps

- **Educational Websites:** Accessing and navigating educational websites and platforms for learning activities and games.
- **Math and Language Apps:** Using interactive apps and games to practice basic math skills, spelling, grammar, and vocabulary.

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Internet Safety and Digital Citizenship

- **Safe Internet Use:** Learning about online safety rules, recognizing safe websites, and understanding the importance of privacy.
- **Digital Citizenship:** Introduction to responsible online behavior, respect for others, and ethical use of digital resources.

Keyboarding Skills

- **Rapid Typing:** Using typing programs or games to develop basic keyboarding skills and familiarity with keyboard layout. RapidTyping is a software application designed to help users improve their typing speed and accuracy. It is a typing tutor program that offers a variety of lessons and exercises tailored to different skill levels, from beginners to advanced typists. RapidTyping is a comprehensive tool for anyone looking to improve their typing skills, whether for personal development, educational purposes, or professional use. Its range of features, engaging exercises, and detailed performance tracking make it an effective and enjoyable typing tutor.

Educational Software and Simulations

- **Math and Science Simulations:** Interacting with educational simulations and software to explore basic science concepts, conduct virtual experiments, and practice math skills.

Educational Videos and Multimedia Resources

- **Online Educational Videos:** Watching age-appropriate educational videos and animations to reinforce learning concepts in various subjects.
- **Interactive Whiteboards:** Using interactive whiteboards or digital displays for collaborative activities and multimedia presentations.

Coding and Computational Thinking

- **Block-Based Coding:** Introduction to block-based programming environments like Scratch to create simple animations and games.
- **Educational Coding Apps:** Using beginner-friendly coding apps or games that introduce coding concepts through puzzles and challenges.

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Digital Art and Creativity Tools

- Drawing Programs: Exploring basic digital art tools and programs to create simple drawings and graphics.
- Storytelling Apps: Using digital storytelling tools to create simple stories with text, images, and audio.

Collaborative Tools and Activities

- Google Classroom: Participating in classroom activities, assignments, and discussions within a digital learning management system.
- Online Collaboration: Collaborating with peers on simple projects using shared documents and online tools for group activities.

Programming, Robotics, and STEM Kits

- Scratch: Scratch is a free, block-based visual programming language and online community developed by the Lifelong Kindergarten Group at the MIT Media Lab. It is designed to introduce children and beginners to the concepts of programming and creative thinking through an easy-to-use interface. Scratch is an effective tool for introducing young learners to the world of programming and computational thinking, fostering creativity, and providing a foundation for further learning in computer science.
- Basic Robotics: Introduction to basic robotics concepts through age-appropriate robotics kits or educational robots.
- Lego WeDo 2.0: Engaging in hands-on STEM (Science, Technology, Engineering, and Mathematics) activities to explore basic engineering and problem-solving skills. LEGO Education WeDo 2.0 is a hands-on learning solution designed to teach elementary school students (typically ages 7-11) the basics of coding, robotics, and STEM (Science, Technology, Engineering, and Mathematics) concepts. It combines LEGO bricks with programmable motors and sensors, allowing students to build and program their own interactive creations. LEGO Education WeDo 2.0 is a versatile and engaging tool that helps young learners develop essential skills in coding, robotics, and STEM through hands-on, interactive learning experiences.

Conclusion

The integration of technology in primary schools marks a significant milestone in the evolution of education. As we reflect on this transformation, it becomes evident that technology has reshaped the landscape of primary education in numerous positive ways.

- ✓ **Enhanced Learning Experiences:** Technology has revolutionized the way students learn by providing interactive, engaging, and personalized learning experiences. Tools such as interactive whiteboards, tablets, and educational software have made lessons more dynamic and accessible, catering to different learning styles and paces.
- ✓ **Skill Development:** Through the use of coding programs like Scratch and robotics kits such as LEGO WeDo 2.0, students are developing critical 21st-century skills. These include problem-solving, critical thinking, collaboration, and digital literacy, which are essential for future academic and career success.
- ✓ **Inclusive Education:** Assistive technologies have made education more inclusive by supporting students with diverse learning needs. Text-to-speech, speech-to-text, and other accessibility tools ensure that all students have the opportunity to succeed.
- ✓ **Teacher Empowerment:** Technology has also empowered teachers by providing them with innovative tools for instruction and assessment. Learning management systems like Google Classroom and communication tools such as ClassDojo facilitate efficient classroom management and foster stronger connections between teachers, students, and parents.
- ✓ **Global Connectivity:** The internet has opened up the classroom to the world, allowing students to explore global cultures, engage in virtual field trips, and collaborate with peers across the globe. This connectivity enhances cultural awareness and broadens students' horizons.
- ✓ **Continuous Improvement:** With the constant evolution of technology, there is always room for growth and improvement. Schools are continuously adapting and updating their technological tools and teaching methods to keep pace with advancements, ensuring that education remains relevant and effective.
- ✓ **Challenges and Considerations:** Despite the many benefits, the integration of technology also presents challenges. These include ensuring equitable access to devices and internet connectivity, protecting student privacy, and providing adequate training and support for teachers. Addressing these challenges requires ongoing investment and commitment from all stakeholders in the education system.
- ✓ **Future Outlook:** The future of technology in primary education is promising. Emerging technologies like artificial intelligence, virtual reality, and augmented reality hold the potential to further enrich the learning experience. As these

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technologies become more accessible, they will undoubtedly play a significant role in shaping the future of education.

In conclusion, the integration of technology in primary schools has created a more engaging, inclusive, and effective educational environment. By continuing to embrace and adapt to technological advancements, we can ensure that primary education not only keeps pace with the digital age but also prepares students to thrive in an increasingly complex and interconnected world. The journey of integrating technology into education is ongoing, and its impact will resonate for generations to come.

4.2. Who and how?

The integration of technology in special education is mainly aimed at the support of special education students, especially students with disabilities. More specifically, the use of computers and appropriately designed peripheral media contribute significantly to the promotion of accessibility for students with disabilities and developmental disorders in every aspect of the educational process.

Who?

Teachers

First, after assessing the individual needs, skills, and interests of students with disabilities and developmental disorders, special education teachers draft and then implement Individualized Education Plans (IEPs). Based on the individual characteristics of the students, the teachers integrate the technology using the appropriate software, tools, and applications to achieve the teaching and pedagogical goals they have set for each student.

A necessary prerequisite is the training and continuous training of special education teachers in the integration of software, applications, and equipment suitable for students with disabilities and developmental disorders.

Parents

A necessary condition for the effective integration of technology in special education is the use of the tools offered by technology by the parents of students with disabilities and developmental disorders. In this way, students apply what they learn at school at home and in this way, the corresponding skills are consolidated and improved.

Several of the software and equipment listed in the next section are very useful tools that can promote communication between parents and their children (e.g. Quick Talker - portable alternative communication aid) and improve their daily lives.

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How?

Special Equipment

Listed below are typical examples of a series of special equipment:

- Alternative computer mice: a) trackball, a device that simulates the use of a mouse, and b) a joystick with a special handle for mobility problems.
- External switches that can be connected to the trackball as left and right clicks, accompanied by bases and arms that can be adapted to wheelchairs, desks, etc., depending on the needs.
- Alternative keyboards suitable for students with mobility problems, coordination difficulties, etc., with different-sized keys and the possibility of using a protective grid.
- Quick talker (portable alternative communication aid) for exchanging messages, selecting images, and recording the corresponding message (e.g. "I want water").
- Eye movement mouse. The user with the movement of the pupil of the eye can move the cursor and do all the actions I would do with a conventional mouse. Suitable for degenerative diseases.

Special Software

The above peripheral devices are of course also accompanied by appropriately designed software that promotes the accessibility of students with disabilities. Below are some of them:

- Super Nova. Suitable for people with visual impairments, such as amblyopia or total blindness. It includes three sub-functions: a) Visual – zoom, proportional movement on the screen, color inversion/contrast, mouse/cursor settings (color, size, shape) so that it is detectable, b) Speech – Speaking function to “read” a text, icon, and anything displayed on a computer screen and c) Braille (in connection with the corresponding peripheral) which helps in tactile reading in the Braille language.
- CatchMe. To practice using a mouse, with voice feedback on the activities involved. Suitable for children with difficulties in fine motor skills and visual motor coordination.

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- Switch Trainer. To learn/practice using the switches (mentioned above in the peripherals), such as enter and space bar, for movement and selection in the single-screen environment.
- Kinems. Includes educational games for students with kinesthetic problems and learning difficulties.
- TD Control and Grid (and with synthesized speech). Two different software suitable for using the eye movement mouse mentioned above in the peripherals. Indicative activities, such as speaking with symbols (MAKATON type), cause-effect relationships, and accessible applications (e.g. YouTube).

Both the peripheral devices (technical equipment-hardware) and the software (programs that perform specific tasks related to the aforementioned devices) presented above can contribute positively to the accessibility of students with disabilities, such as vision problems, absence of speech, and kinesthetic, mobility, and fine motor difficulties.

Also, interactive boards are often used to support teaching, through the display of Word and PDF files (e.g. texts, worksheets) that are given to the students, to facilitate the monitoring of the learning process. Also, on the interactive board, the students do various digital interactive consolidation exercises on online platforms (e.g. wordwall) and educational activities through software (e.g. GCompris). The contribution of interactive boards to special education lies in the possibility they offer to apply the multisensory method, mainly through the senses of sight and touch.

A particularly innovative dimension of the integration of technology in education in general is educational robotics. More specifically, the integration of educational robotics in special education seems to be able to improve the performance of children with developmental disorders, such as learning difficulties, ADHD, and autism. In particular, as far as the autism spectrum is concerned, it seems that educational robotics can make a positive contribution, as the robots do not have expressions on their faces, with the result that the attention of children on the autism spectrum is not distracted and they concentrate more easily on each task activity.

5. Conclusion

The integration of digital technologies and computational thinking into education represents a transformative shift in how knowledge is gained, understood, and applied. The rapid spread of Information and Communication Technologies (ICT) has pierced every aspect of society, reshaping education to align with the needs of the Digital Age. This shift emphasizes not only the access to vast amounts of information but also the development of new skills essential for the modern world. Digital literacy, encompassing the ability to search, collect, evaluate, and manage information, has become a fundamental aspect of modern education. It is recognized as an essential life skill, alongside linguistic, mathematical, and scientific literacies. Students are not merely passive recipients of information but are expected to engage critically and creatively with digital content. This requires a move away from traditional curricula that prioritize static knowledge towards more dynamic approaches that foster problem-solving, creativity, and collaboration through digital tools.

Computational thinking, a subset of digital literacy, stands out as a crucial competency in this landscape. Rooted in algorithmic thinking, it equips learners with the cognitive tools to approach complex problems methodically, employing digital tools to organize data, design systems, and model solutions. This ability is recognized as essential not only for those pursuing careers in technology but for all citizens navigating an increasingly digital world.

The education system is now tasked with nurturing these skills from an early age, integrating digital and computational literacies into core curricula. This approach should be seen as equivalent in importance to basic skills such as reading and writing. By fostering these abilities, educators can prepare students for participation in the Knowledge Society, ensuring they are not only consumers of information but active contributors capable of critical and creative engagement with digital technologies. As has been stated, the evolving role of digital technologies in education is both a challenge and an opportunity. It requires a reimagining of pedagogical approaches to ensure that students are equipped with the skills necessary to thrive in a digital world. The focus is no longer solely on knowledge acquisition but on the development of critical, creative, and computational thinking skills that will enable students to navigate and contribute to the increasingly complex digital landscape.

The Digital Education Action Plan (2021-2027) serves as a critical and comprehensive framework for advancing digital education across Europe. The plan is not merely a reaction to the COVID-19 pandemic, but a forward-looking strategy designed to integrate digital tools and platforms into education systems at all levels. The integration of digital technologies into educational practices has become increasingly essential in addressing the learning needs of students in a rapidly evolving technological landscape. This academic inquiry has examined the historical context, regulatory frameworks, and policies that underpin the

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Digital Education Action Plan, while also exploring the challenges and opportunities associated with its implementation.

The digital transformation has revolutionized the way education is delivered. Emerging technologies such as artificial intelligence (AI), virtual reality (VR), and personalized learning platforms have the potential to tailor learning experiences to individual needs, making education more inclusive, adaptive, and effective. However, the successful implementation of these technologies requires substantial infrastructural support, teacher training, and the development of digital competencies among both educators and students. Without this foundational support, the potential benefits of digital education may remain unused.

The challenges posed by the digital divide, where unequal access to digital tools and resources hampers educational equity, are significant. Socio-economic differences mean that students from disadvantaged backgrounds may struggle to access the technological infrastructure necessary for full participation in digital learning. Addressing this issue requires coordinated efforts at both national and European levels, as well as targeted investment in digital infrastructure and inclusive policies.

One of the most critical components of successful digital education implementation is teacher training. As digital education continues to evolve, educators must be equipped with the knowledge and skills to effectively incorporate new technologies into their teaching practices. Continuous professional development programs, supported by European initiatives such as Erasmus+, provide teachers with opportunities to enhance their digital competencies and pedagogical strategies. However, more needs to be done to ensure that all teachers, regardless of location or resources, have access to high-quality training that prepares them for the demands of digital education.

Inclusion and equity remain central to the goals of the Digital Education Action Plan. The European Union has made significant efforts to bridge the digital divide by promoting accessible technologies and inclusive teaching practices. However, challenges remain in ensuring that students with disabilities, those from marginalized communities, and those in rural or low-income areas have equal access to digital tools and learning opportunities. Initiatives that provide assistive technologies, as well as policies that promote digital literacy among all students are crucial for creating an inclusive digital learning environment.

The future of digital education in Europe is full of potential, but achieving the strategic objectives of the Digital Education Action Plan requires ongoing commitment and collaboration among member states. Key strategic objectives include improving digital skills across the population, enhancing the use of digital technologies in teaching and learning, and ensuring that education systems are inclusive and accessible. To meet these goals, the Plan outlines initiatives such as the development of digital content frameworks, the creation of open educational resources, and the promotion of ethical guidelines for using artificial

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intelligence in education. By promoting collaboration, investing in digital infrastructure, and fostering inclusive practices, the Digital Education Action Plan has the potential to revolutionize education in Europe. The future of digital education is one of potential and promise. With sustained efforts, Europe can build an education system that is resilient, inclusive, and prepared for the challenges of the digital age.

The creation of a European Digital Education Hub is also a significant step forward. This hub serves as a platform for knowledge sharing, collaboration, and innovation in digital education, bringing together educators, researchers, policymakers, and industry experts. It will play a significant role in addressing the current fragmentation of digital education policies across Europe and ensuring a coordinated approach to digital transformation in education.

For digital education to succeed in the long term, several key recommendations must be considered. First, sustained investment in digital infrastructure is necessary to ensure that all schools and universities have access to the tools and technologies they need to support digital learning. Second, the development of high-quality digital educational content should be prioritized, with a focus on creating resources that are accessible, inclusive, and adaptable to diverse learning needs. Open educational resources (OER) should be promoted and widely shared to enhance the quality of digital education across Europe. Third, teacher training must be continuous and evolving, providing educators with the support and resources they need to stay up to date with technological advancements and pedagogical best practices. Lastly, policies aimed at reducing the digital divide should focus not only on providing access to technology but also on fostering digital literacy among all students, ensuring that they can fully participate in the digital world.

The integration of ICT into education has become essential in preparing students for the demands of a digitalized world. The three national educational systems analyzed—those of Greece, Italy, and Finland—demonstrate how ICT can serve as a transformative tool, reshaping educational practices and improving student outcomes. However, each country’s approach reflects unique cultural, pedagogical, and technological considerations, and highlights both commonalities and differences in their strategies.

In Greece, the inclusion of ICT in the curriculum is comprehensive, spanning from primary to higher education. The Greek strategy emphasizes not only computer literacy but also the development of critical thinking and creativity through digital tools. This approach aligns with broader educational reforms in the country aimed at integrating ICT as a learning tool across subjects. ICT is seen not only as a technical skill but also as a means to develop students’ problem-solving capabilities and collaborative abilities. The Greek curriculum also includes provisions for developing digital citizens, encouraging students to understand their roles and responsibilities in the digital world, which is crucial in fostering safe and ethical online behavior.

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Similarly, Italy integrates ICT as a cross-disciplinary tool in primary education. Italian educational strategies place a strong emphasis on digital competence as a core component of lifelong learning. The curriculum highlights the development of digital literacy skills such as collaboration, communication, and media literacy. By incorporating ICT into various subjects, the Italian education system aims to familiarize students with digital technologies from an early age, ensuring they can engage with technology critically and responsibly. This is particularly significant given the rise of digital media in everyday life and the growing importance of understanding how to navigate and create content in digital environments.

Finland, often regarded as a leader in educational innovation, presents a highly integrated approach to ICT in education. Finnish students are exposed to ICT from the earliest stages of their schooling, with a focus on developing multiliteracy and civic skills. The Finnish educational strategy highlights the importance of ICT not only as a tool for learning but also as a way to encourage creativity, collaboration, and international interaction. The emphasis on responsible use of ICT, including cybersecurity, further reflects the Finnish commitment to creating a well-rounded, digitally literate student population. Importantly, Finland’s model of Education also incorporates ICT as a means of addressing sustainable development, a growing concern in the global educational landscape.

Across these three educational systems, certain themes emerge. First, there is a clear recognition of the necessity of digital literacy in contemporary education. All three countries have implemented curricula that not only teach technical skills but also foster critical thinking, creativity, and problem-solving abilities through the use of ICT. This holistic approach reflects an understanding that digital competence is not merely about using technology but also about understanding and contributing to the digital world responsibly and effectively.

Second, these strategies underline the importance of teacher training and professional development. In Greece, teachers are required to attain certification in different levels of computer literacy, while in Finland, continuous training is integrated into the professional development of educators. Italy also recognizes the importance of equipping teachers with the skills necessary to implement ICT effectively in the classroom. Without adequately prepared teachers, the potential of ICT to transform education cannot be fully realized. Thus, investing in teacher training is a critical component of successful ICT integration in schools.

Finally, the use of ICT in teaching cultural heritage, particularly in Greece and Italy, highlights the intersection between technology and tradition. By utilizing tools such as virtual reality, digital archives, and interactive platforms, students can engage with their cultural heritage in innovative ways. This approach not only preserves and promotes cultural knowledge but also makes learning about heritage more engaging and accessible for younger generations.

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Such strategies demonstrate the potential of ICT to bridge the gap between past and present, offering new ways to experience and understand historical and cultural contexts.

To sum up, the national ICT strategies of Greece, Italy, and Finland reflect the growing importance of digital literacy in the 21st-century educational landscape. By integrating ICT into their curricula, these countries are preparing students to thrive in an increasingly digitalized world. The focus on critical thinking, collaboration, creativity, and responsible digital citizenship ensures that students are not only consumers of technology but also active and informed participants in the digital age. As these strategies continue to evolve, they will undoubtedly play a crucial role in shaping the future of education and society at large.

The integration of technology in primary schools represents a transformative shift in the educational landscape, shaping the way teaching and learning occur. Technology has enriched learning environments, offering interactive, personalized, and engaging experiences that cater to diverse learning styles. Digital tools, such as interactive whiteboards, coding programs, and educational software, have enhanced students' skill development, fostering critical 21st-century competencies like problem-solving, digital literacy, and collaboration. These skills are increasingly vital for success in both academic and professional contexts.

Moreover, technology has made education more inclusive, particularly through assistive tools like text-to-speech and speech-to-text applications, which support students with diverse needs. The accessibility provided by these technologies ensures that education becomes a more equitable and inclusive experience for all learners, regardless of their individual challenges.

From a pedagogical perspective, teachers have been empowered with digital platforms and resources that allow for innovative instructional methods and efficient classroom management. Learning management systems and communication tools have facilitated stronger connections between educators, students, and parents, contributing to a more collaborative and supportive learning environment. Furthermore, the global connectivity made possible by technology has opened new opportunities for cultural exchange and collaboration, preparing students to engage with an increasingly interconnected world.

However, despite the undeniable benefits of technology in education, some challenges remain. Equitable access to devices and internet connectivity, student data privacy, and ongoing professional development for educators are critical issues that need to be addressed to ensure the effective and responsible use of technology in schools. These challenges require sustained investment and collaboration among educational stakeholders to ensure that all students can benefit from technological advancements.

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Looking to the future, advancing technologies such as artificial intelligence, virtual reality, and augmented reality promise to further revolutionize education by offering even more immersive and personalized learning experiences. As these tools become more widely available, they will play a significant role in the continuous evolution of primary education.

All in all, the integration of technology in primary schools has profoundly reshaped education, creating a more engaging, inclusive, and future-oriented learning environment. By continually adapting to new technological developments and addressing associated challenges, schools can ensure that students are well-prepared for the demands of the digital age. The ongoing journey of integrating technology into education holds great potential for further enhancing educational outcomes and preparing the next generation for an increasingly complex and dynamic world.