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## Digital learning: Differentiated teaching models using ICT in a Greek context – Good Practices "We give money, we buy things"

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### Abstract

The importance of money in people's lives today is an important and useful skill for individuals in a transactional society. Money management is a communication, transaction, and socialization skill. People with special educational needs and especially people with mental retardation with the right training can develop the skill of recognizing and using money. Differentiated teaching with the help of ICTs is an educational approach to knowledge suitable for teaching people without or with special educational needs.

**Keywords:** ICTs; Differentiated Teaching; Mental Retardation; Money

### 1. Introduction

ICT is quickly becoming a vital tool for educators, particularly in assistive technology for people with disabilities (Chaidi et al., 2021). ICTs help people with disabilities develop their primary functions by, among other things, facilitating mobility, learning, employment, communication, and interaction with the outside world. According to Rodrigues and Alves (2013), this encourages social inclusion or the inclusion of individuals with disabilities in various settings across society. Galvão Filho (2009) claims that a change in reality and paradigms in our society is challenging segregation systems and becoming more accepting of diversity, creating new opportunities for everybody, including those with disabilities, to be included in society.

As a result, the growing usage of ICT shows that knowledge and development have a stronger relationship when it comes to preparing people for novel insights and educational opportunities. Through inclusion, a general education classroom provides students with access to materials, and tailored instruction is developed and put into practice. Individuals with intellectual disabilities are also categorized as having special needs, and it can be especially challenging to explain to regular people the significance, worth, acknowledgment, and application of money. To approach money and its value in life, personalized teaching utilizing ICT makes mathematical ideas, concepts, operations, and symbols more accessible (Unesco, 2009). This approach was developed and put into practice for children with intellectual disabilities in special education and training facilities. According to the research, differentiated instruction can be applied as a teaching strategy as well as a means of helping kids fit in at an inclusive or open school. (Lykou et al, 2023)

The course's goal is to teach students cognitive skills that will enable them to overcome difficulties in their daily lives by making a direct and lasting connection between the material and their experiences and reality. Encouraging students to think practically can help them become better versions of themselves and use what they learn in everyday life. Special attention is given to the development of cooperative abilities.

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## 2. Bibliographic studies

### 2.1. The role of ICTs in education

The use of ICT and technology is a valuable and useful tool to facilitate the educational process. The development of technological applications has changed teaching methods by offering an interactive multi-sensory learning environment to students. Computer-based education motivates students, increases their attention and concentration, motivates them cognitively, and mediates the discovery of the learning process. It strengthens the connection between the concrete and the abstract and between the real object and the corresponding abstract representation (Clements, 1999). The advantages of the technology are the combination of multiple stimuli (auditory, visual, tactile, graphics, animation), interactivity as it allows the user to manipulate representations, feedback, the possibility of correcting actions and creating changes that are not easy to replicate in the real world (Moyer, Bolyard&Spikell, 2002).

Promoting equality in education is the primary goal of utilizing ICT in the classroom for children with disabilities, according to the European Agency for Development in Special Education (2013). Furthermore, the aforementioned body makes the case that ICT use should be viewed as a tool to enhance participation in tailored learning approaches for students with disabilities, rather than as an end in and of itself. ICT infrastructures should be genuinely accessible, based on the ideas of universal learning design, to attain fairness in education (Chaidi et al., 2021).

The swift advancement of technology has resulted in the development of educational software packages that teach a variety of skills and information. All technology, including computers, tablets, interactive whiteboards, cell phones, assistive and adaptive technologies, alternative keyboards, auxiliary and alternative communication devices, and other specialized technology applications, will be used to make up for the students' limited access to ICT (educational aids, such as screen readers), to ensure that every student has equal access to education. A teacher's proper preparation, oversight, and direction are necessary for the efficient use of technology.

Students with intellectual disabilities struggle with language and reading comprehension, making it difficult for them to comprehend written material. McCarthy (2006)

In contrast, learning through technology that involves interaction de-emphasizes the use of text and leads to experiential learning-self-teaching (Mastropieri, Scruggs&Magnusen, 1999). Intellectually disabled students learn best when they are actively engaged in the material and make connections between concepts and real-world experiences.

It is important to mention that students with mental disabilities who cannot communicate with speech will need to be trained in systems of alternative (in cases of total lack of speech) and augmentative (in cases of the need to strengthen language and communication development) communication systems. The dominant systems are MAKATON, PECS, and communication boards. Low-tech communication systems include MAKATON, PECS, text-based (e.g. lists, tables, books, etc.), nontext-based (e.g. symbol systems, images, etc.). High-tech communication systems include electronic communication devices and computers with specialized and adapted hardware (e.g. talking books, speech-to-text or text-to-speech conversion software, etc.).

Furthermore, the growing impact of technology and artificial intelligence (AI) on people's daily lives has been connected to significant societal changes over the past few decades. The most important of these are the capacity for information management, transmission, and distribution as well as the ability to process and use information to create new knowledge. The successful and constructive function that digital technologies play in education and other areas of daily life must be emphasized. All scientific and production processes, as well as decision-making, intervention, assessment, and education, are facilitated and improved by mobile phone technologies. (Lykou and others, 2023)

In addition to articles (Chaidi et al., 2021), there are numerous applications of T.P.E. using AI Robotics & STEM. Information can be accessed, analyzed, and transferred using Emerging Technologies (NT), especially Digital technologies. New knowledge can also be managed and used.

The emergence of the Information Society (Bakola et al., 2019, 2022) and a new social reality have been sparked by Information and Communication Technologies (ICTs), with their unmatched technological capabilities. More games and gamification techniques and methods improve the general and special education framework's welcoming and pleasurable learning environment and procedures. 2022; Chadi et al.

Finally, it's important to discuss how ICTs work in terms of their models and conceptions. Learning more about effective educational practices and the outcomes of decision-making accelerates and enhances the development of

metacognition, awareness, meditation, and emotional intelligence (Drigas; Papoutsis, 2020; Drigas; Mitsea, 2020, 2021, Chaidi; Drigas, 2020; Drigas; Kariotaki, 2019; Drigas et al., 2022). Finally, research conducted by Driga et al. (2019), Stavridou et al. (2021), and Zavitzanou (2021) suggests that a range of environmental and nutritional factors may either promote or inhibit the development of mental abilities and talents.

Last but not least, we emphasize the significance of all digital technologies in the field of education and in mental disabilities training, which is very effective and productive, facilitates and improves the assessment, the intervention, and the educational procedures via mobile devices that bring educational activities anywhere [65-67], various ICTs applications that are the main supporters of education [68-73], and AI, STEM, and ROBOTICS that raise educational procedures to new performance levers [74-79]. Additionally, the improvement and blending of ICTs with theories and models of metacognition, mindfulness, meditation, and emotional intelligence cultivation [80-91], accelerates and improves more than educational practices and results, especially in children with mental issues, treating domain and its practices like assessment and intervention.

## **2.2. Money**

Mathematics is essential in all of our lives. For children with disabilities, they can be a means of understanding reality, since they help solve everyday problems, which often seem insurmountable. In particular, students acquire a better understanding of time, become familiar with numbers, operations, and measurements, and are trained in money management and financial transactions.

Students' ability to recognize different currencies and do calculations is one of the key skills built during their school years. We could even say with confidence that calculating money is one of the most important skills that children take with them into their adult lives and that is a daily part of our lives. It is a skill of autonomy.

One of the key functional skills for independent living is managing money.

For every student, being able to count money is an essential functional ability. Money not only allows averagely intelligent but learning-disabled children to purchase items they desire, but it also lays the groundwork for them to comprehend the base ten number system, which is useful in science, technology, and even the social sciences for understanding decimals, percentages, and the metric system.

One of the abilities necessary for self-determination and the chance to live independently in the community for students with mental impairment and lower functioning is counting money. Similar to other abilities, managing money and counting should be supervised, focusing on strengths and providing the "baby steps" that eventually lead to independence.

## **2.3. Mental Disability / Mental Difficulties**

The American Association on Intellectual and Developmental Disabilities (AAIDD) proposed the following definition in 2010, acknowledging that an individual's behavior is influenced by both their environment and themselves, as well as by the relationship between the individual and his surroundings:

"Intellectual disability is a disability characterized by significant limitations in mental functioning and adaptive behavior manifested in conceptual, social, and practical skills. The disability appears before the age of 18". (Schallock et al., 2010, p.1) The definition identifies three criteria for the diagnosis of intellectual disability.

To differentiate intellectual impairment from other disabilities, developmental stages must be met by limitations in mental functioning and adaptive behavior. General mental abilities like learning, thinking, problem-solving, etc. are referred to as mental functioning or intelligence. Adaptive behavior is the culmination of a person's learning and application of a variety of practical, social, and conceptual skills that they encounter in daily life. These include mobility, safety, money, time, mathematical concepts and orientation, interpersonal skills, social responsibility, self-esteem, trustworthiness, naivete, problem-solving abilities, and the ability to follow rules and obey laws.

Accordingly, the 5th edition of the manual of the American Psychiatric Association (DSM-V - 2014) gives the following definition:

"Intellectual Disability (Intellectual Developmental Disorder) is a developmental-onset disorder that includes not only cognitive deficits but also deficits in adaptive functioning in the conceptual, social, and practical domains" (American Psychiatric Association, 2013, p. 17).

The diagnostic criteria for intellectual disability are defined by the American Psychiatric Association Manual (DSM-V):

- "A. Deficits in mental functions, such as reasoning, problem-solving, planning, abstract thinking, judgment, academic learning, and experiential learning, confirmed not only by clinical assessment but also by an individualized, standardized intelligence test" is the DSM-V (American Psychiatric Association Manual) diagnostic criteria definition of intellectual disability.
- B. Adaptive functioning deficits that result in the individual not meeting norms for social responsibility and personal independence that are suitable for their age and developmental stage. People with impairments in adaptive functioning are unable to do one or more daily activities, such as communicating, interacting with others, and living independently in a range of environments, such as the home, job, community, and school, without ongoing assistance.
- C. Deficits in mental and adaptive functioning that manifest at the developmental stage (American Psychiatric Association, 2013, p. 17).

The causes of Mental Retardation can be:

- Prenatal causes
  - Hereditary factors
  - Chromosomal abnormalities (Down syndrome, Klinefelter syndrome, Turner syndrome),
  - Diseases of the pregnant woman (infections, rubella, measles, mumps),
  - Abnormalities of metabolism
  - Rh incompatibility of the mother's blood with that of the fetus,
  - Anoxia,
  - Injuries of the pregnant woman, 8. Poor diet, 9. Lead poisoning.
- Perinatal causes
  - Anoxia,
  - Brain injuries and bleeding,
  - Premature birth.
- Postnatal causes
  - Infectious diseases,
  - Accidents,
  - High fever,
  - Metabolic abnormalities,
  - Psychosocial factors (institutionalization, deprived educational environment, emotional deprivation).

When providing therapeutic intervention for individuals with mental retardation, we consider:

- their mental capacity (as determined by the evaluation of the psychologist) Here, we differentiate between the following groups:
  - mild mental retardation,
  - moderate mental retardation,
  - severe mental retardation, and
  - borderline intelligence.
- The work objectives that, in light of each child's unique circumstances, the Expert Group determines are urgent.

### 2.3.1. Mental Retardation Calculation

The IQ is the most often used classification system for mental impairment. Particular care must be taken when interpreting the intelligence index results for mentally retarded individuals since, while it is a single trait of the individual, it is not helpful in the educational process on its own. Still, it's a method of attempting to classify this diverse group.

**Table 1** Retardation Levels due to Intelligence Index

a/a	Descriptive assessment	Mental Power (Intelligence Index)
a.	mild cognitive impairment	D.N. 50-55 to 70
b.	Mild mental retardation	D.N. 35-40 to 50-55
c.	extreme mental retardation	D.N. 20-25 to 35-40
d.	extreme mental retardation	D.N. below 20-25
e.	Undefined mental retardation	when a person's intelligence cannot be determined using weighted testing, even though there is a compelling argument for mental retardation.

The American Society of Mental and Developmental Disabilities originally proposed in 1992 to functionally classify intellectual disability based on an individual's profile of needed supports, which places a greater emphasis on strengths than weaknesses, as opposed to the traditional classification system of mild/mild, moderate, severe, profound, or very profound. Assessments of the level of support required to enhance functioning at home, school, and in the community were made in 2002 and 2010. It divides the required assistance into four intensity categories: diffuse, extended, limited, and periodic.

The levels of assistance intensity for individuals with intellectual disabilities include diffuse, extensive, limited, and periodic, according to Luckassonet al (2002).

**Periodic:** It is support given when needed, without being continuous. Short-term or fragmented support, ranging in intensity from high to low, at times of transition (such as a job loss).

**Limited:** Intensive help that is consistent across time and isn't abrupt in any way (such as support during the transition from school to adulthood or time-limited vocational training).

**Extended:** Unlike time-limited support, such as long-term living assistance at home, extended support is defined by regular involvement (e.g., daily) in particular settings (e.g., work or home).

**All-encompassing:** Long-lasting, steady, and highly focused support. It is offered everywhere and for the entirety of a person's life. It most likely includes multiple employees and calls for greater involvement than just continued or restricted help.

### 2.3.2. Characteristics of students with intellectual disabilities

Children with intellectual disabilities are delayed in achieving developmental achievements (walking, speaking, etc.) and thinking, processing, and learning develop at a slower rate. They learn at a slower pace and their information processing speed is low. They have difficulty processing and manipulating abstract concepts, rules, generalizations, and logical relationships. They engage in concrete rather than abstract concepts and have difficulty thinking abstractly as well as understanding cause-and-effect relationships. They have difficulty generalizing what they have learned and applying it to different contexts and situations. They have difficulty with executive functions and choosing the appropriate action. They cannot use strategies effectively or fail to generalize newly acquired strategies appropriately. More practice trials with feedback repetition and the use of the multisensory method are needed.

They have limited attention and concentration. They find it difficult to focus their attention on the important feature of a stimulus that they are called upon and at the same time their concentration time is limited. They have difficulty sustaining their attention for as long as necessary to complete a specific task.

Students with intellectual disabilities have memory difficulties. Specifically, their ability to hold information in short-term memory is impaired and they take longer to automatically recall information, while successfully handling a smaller amount of cognitive information. In addition, they also have difficulty with working memory to use and manipulate the necessary pre-existing knowledge to carry out a task.

Students with intellectual disabilities have difficulty in language comprehension. Their sentences are less complex and often disorganized than their peers, and they show grammatical errors. Their vocabulary is limited. They have difficulty understanding and following complex instructions.

Although they desire and seek social interaction, their communication skills are immature and they have difficulty forming friendships.

Students with intellectual disabilities show a reduced motivation to learn and a reduced ability to solve problems. They show difficulties in reading, writing, and mathematics.

However, intellectual disability is not a static condition and each student exhibits different behaviors and different characteristics. For this reason, it is necessary to evaluate the potential of each child, in terms of self-regulation in the emotional, cognitive, and social domains (Borkowski et al., 2007)

### *2.3.3. Educational Intervention*

The goal of the people involved in the education of people with disabilities is the development of those skills that are necessary for the daily life of the child.

We must train people to be autonomous and independent, both in the family and in society in general. Autonomy and independence will make it possible for these individuals to be included in the wider groups where they belong.

- Designing the individualized educational program based on the needs of the student and determining the necessary and desired goals.
- Assessing the support the student needs to achieve the goals.
- Prioritizing the goals that are important for the student to achieve according to his parents and teachers. Identification of teaching methods, necessary adaptations, and steps to implement the program. The skills taught should be based on what the student needs to have mastered now and in adulthood. Implementation and implementation of the personalized educational program.
- Monitoring progress.
- Evaluation of the results.

## **2.4. Differentiated Teaching and ICTs**

### *2.4.1. Definition*

Differentiated instruction is a philosophical theory that acknowledges that every student is an individual and should be addressed as such. It is a comprehensive approach to thinking about students, teaching, and learning (Tomlinson, 2001). The typical student is an abstract idea that does not apply to any particular student, according to the tenets of differentiated instruction. This suggests that while teaching children how to think and learn, they also acquire knowledge through problem-solving and active learning. Therefore, it is recognized that differentiated instruction satisfies the contemporary demand for respect for the unique requirements and characteristics of each student, including the variety of children's thought processes and modes of learning (Argyropoulos, 2013).

Differentiated instruction is defined as "teaching that treats the student as an integral entity inside and outside the school structure (Tomlinson, 2001) to understand concepts, acquire fundamental skills, as well as the active participation of the student in the learning process from the closest knowledge". The goal will be accomplished by the employment of differentiation activities, the application of instructional methods, enjoyment, and creative strategies that change or shape the content of the academic material (Tomlinson, CA, & Imbeau, MB, 2010). Each student can participate equally in a first-rate learning environment based on their abilities and interests [Argyropoulos, B. (2013), with complete access to information and instruction that teaches them how to learn.

By using differentiated instruction, instructors should concentrate on and address the following four areas, according to Tomlinson:

- Content: Recognize the knowledge and resources that a student needs to acquire.

- Process: Educational activities designed to make learning more understandable for students.
- Projects: A way for pupils to demonstrate their knowledge.
- Learning environment: The way students interact with each other and how the class "feels"

Differentiated instruction based on the three components—student readiness, interests, and unique learning styles—is viewed as an inclusive teaching strategy that emphasizes addressing each student's unique learning needs to highlight their value and enable them to participate in the learning environment that is designed to prevent certain students from approaching knowledge (Karageorgou, X., 2013).

Although the assessment is formative, their growth and effort as a learner are evaluated in the final evaluation [4] to increase their confidence and self-esteem regardless of their result (Moon, TR (2005, Tomlinson, C. 2005). a continual process that looks at each student's unique learning style and tracks their progress to provide the best possible training.

When students cohabit in some topics with people who are roughly their age chronologically but have substantially varying degrees of language competency, abilities, motivation, and needs, differentiated teaching aims to provide each student with effective instruction and learning.

After that, the most important strategies for differentiating instruction are covered, along with how to plan and structure courses around a main idea that will emphasize student learning rather than course content:

The following activities are included in the curriculum: Cubing, Jigsaws, RAFT, KUD, TPRS, Graphic Organizers, Frayer Model, Think-Pair-Share, Find Someone Who, KWL, Graded courses, Think Tac Toe, and Learning Centers.

In essence, differentiated instruction combines traditional whole-class instruction, tailored intervention, and small-group training. According to Tomlinson (1995), difference occurs in three areas: the learning products, the process, and the content. When designing activities for differentiated instruction, teachers take into account Gardner's multiple intelligences and employ materials that are graded according to difficulty. This is in contrast to traditional teaching, which provides the same material and assessment methods to an imagined "average" student.

It follows that showcasing each student's worth and incorporating them into the classroom are the objectives of differentiated instruction. Students' feelings in classrooms that are considered "safe" situations in terms of both physical and "cognitive" safety have a significant impact on the learning environment and general classroom atmosphere that supports differentiated teaching (Dimitropoulou, 2013). The same source states that children should work on projects that match their talents and abilities to feel both emotionally and academically safe.

Three distinct aspects of differentiated teaching can be identified in the environment created in the differentiated classroom: the student's readiness, his interests, and his unique learning style, or learning profile (Panteliadou, 2008).

It is important to note at this point that differentiated teaching has been suggested as a means of achieving inclusive education, with the main goal being to address each student's unique learning needs in light of his or her diversity (Tomlinson, 2004, as referenced by Panteliadou, 2013).

A teacher's job is to create the conditions necessary for each student to grow as much as possible, not to set lesser expectations for certain pupils (Karageorgou, 2013). Among other things, differentiation should make clear what the students may do with the knowledge they have gained from the didactic unit; specifically, it should help them learn how to self-regulate (Argyropoulos, 2013). Students must work on projects that match their talents and abilities to feel intellectually acceptable, which will allow them to self-regulate and become autonomous (Dimitropoulou, 2013), as was previously indicated. If the pupils can genuinely take pleasure in their accomplishments on an individual and group level, the instructor will also possess a fundamental instrument for empowerment and encouragement in the classroom (Dimitropoulou, 2013). Editors: Panteliadou, S. and Filippatou, D.

To apply differentiated teaching, teachers must use several approaches and levels of instruction and assessment in addition to exact targeting and self-regulation. Because no method of working is deemed "special" in a differentiated classroom, learning difficulties are not stigmatized or singled out for special treatment (Panteliadou, 2008). Instead, all students work with diverse material and engage in different groups.

In terms of assessment, it is a continuous procedure that lasts the entire instructional unit. Specifically, the final evaluation methodically assesses the student's effort as well as the outcome of the instructional approach used (Karageorgou, 2013). In this way, students' self-worth and confidence are bolstered even more, which leads to the empowerment mentioned before within the classroom.

Thus, it appears that differentiated instruction supports inclusive education for all students in a setting that guarantees fair engagement, complete access to information, and advancement of that knowledge (Argyropoulos, 2013). It is

acknowledged that students benefit from differentiated instruction by working together and taking an active role in the learning process. As a result, kids have a sense of purpose and activity and make use of their latent potential, which would remain unrealized through conventional instruction.

Furthermore, the assessment needs to be differentiated within the framework of a class that is taught differently. It has been suggested (Moon, 2005; Tomlinson, 2005, as cited by Filippatou, 2013) that assessment ought to be ongoing and focused less on assessing students' performance as a whole and more on tracking their development and examining their unique qualities to create lessons that are effective for every student.

#### 2.4.2. Differentiated teaching and special education

Differences are implemented in the following categories as part of the inclusive education approach, which is currently a philosophy in official educational institutions: A) students with special needs and impairments B) students who are members of minority nationalities D) Students whose parents come from low-income households C) Students who study Greek as a second language 16] Examples of different (Chaidi & Drigas, 2023; Lykou et al., 2022, 2023; Lykoy et al., 2022, 2022) are provided by Johnson PM (1998b).

#### 2.4.3. The Role of ICTs in Differentiated Teaching

Digitally differentiated instruction using ICT (2014, Teachers can build a better learning environment for approaching information by using tools, methods, and media that adapt to the content, activities, and learning processes (Koutsouraki, St., and Berkoutis, A.). These resources assist in adjusting education to the interests, readiness, and learning style of the student []. 2014].? Using the TPACK (Technological Pedagogical Content Knowledge) approach, Hobgood, B. & Ormsby, L. (n.d.) are thought to be a suitable way to differentiate education and allow students with special needs to remain in contact with their peers. [23] Benjamin, A. (2005). ICT offers six characteristics that support differentiated instruction:

- Confidentiality;
- Teamwork and communication abilities;
- Arrangement;
- Accommodating diverse learning preferences and sensory learning
- Providing choices

Authentic learning.

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### 3. Project description

In the context of the good practices of the differentiated teaching of mathematics and thematic unit: money, for students with mental retardation, a scenario, and a lesson plan using ICT is presented.

Title: "We give money, we buy products".

#### 3.1. Cognitive areas involved

The selected activity is aimed at students with Special Educational Needs, aged 9-15 years of the Middle Level, with Mental Retardation.

Principles of Unit Selection

The importance of money in the life of all individuals is great. A child with Mental Retardation cannot automatically understand the abstract concept of money, as well as some concepts or mathematical operations that we use to deal with money, are not easily understood by our children.

Learning how to negotiate money is compatible with the APS and DEPPS of Special Education and Education of students with Intellectual Disabilities, and is connected to the following Sectors, which concern the education of students:

- Social Adaptation: a) Autonomy, Self-service b) Social communication c) Social skills
- Creative Activities: a) Visual arts
- Preparatory School: a) Oral Speech b) Psychomobility c) Emotional organization
- Basic Academic Skills: a) Mathematics: Mathematical concepts, b) Language



- in the acquisition of Skills: Recognition, Auditory memory, Visual memory

### 3.2. Students' knowledge and prior ideas or perceptions

Have students acquired skills?

- Distinguish euro coins and their value
- Categorization of coins 1,2,5, 10,20,50 cents and 1,2,5,10, 20 euros based on their characteristics (shape, size, and color)
- They recognize the Greek euro coins
- They exchange coins
- They work in groups of two and four.
- Use of the YouTube software
- Use of educational software
- Use of an interactive table.

### 3.3. Teaching objectives or expected results

The didactic unit "Use of coins (1,2,5,10,20,50 cents and 1,2,5,10, 20 euros) in everyday life" is a topic that aims to introduce students to the use of money: reconciliation: "I give money and buy a product" and is part of the section: Getting to know the value of coins. Also, according to the PAPEA: LEARNING READINESS ACTIVITIES (BOOK) EAE, it is a teaching unit of the General Unit of Mathematical Concepts: "money" that the students aim to:

- master the concept of conciliation
- recognize the coins they have to give to buy specific products,
- make exchanges
- find ways to pay for a product with different currencies
- play buyer-seller roles and pay and receive change
- estimate the total value of two or more coins and find the remainder of an amount

### 3.4. Objectives of the teaching scenario

#### 3.4.1. BRIEF DESCRIPTION


"We give money, we buy products"

The products are recognized by their image and the concept of "buying" is approached with the ultimate aim of understanding the social skill of the transaction.

The activities chosen are:

- Students recognize the coins they have to give to buy specific products
- Students find ways to pay for a product with different currencies Students play buyer-seller roles and pay and get change

**Table 2** The objectives of the scenario

		
The objectives of the scenario are:		
<b>A) Cognitive objectives:</b>	<b>B) Regarding the use of ICTs</b>	<b>C) Regarding the learning process</b>
<b>a) knowledge</b>	-To develop a positive attitude towards the computer as a	Learning objectives are cognitive and metacognitive, affective – related :

<p>- Students identify and name different products from their pictures.</p> <p>- Students understand that they have to give money to buy a product.</p> <p><b>b) skills:</b></p> <p>-Students develop the skill of dealing with money</p> <p><b>c) stances:</b></p> <p>-Students recognize the exchangeability of coins.</p>	<p>means of extracting information in the learning process</p> <p>-To enable students to</p> <ol style="list-style-type: none"> <li>1) search,</li> <li>2) locate,</li> <li>3) analyze, and</li> <li>4) process information on the Internet.</li> </ol>	<p>-to creating motivation.</p> <p>Students through the process of research and collaboration in the project, deepen their knowledge, undertake a project that is meaningful to them, and reinforce positive attitudes towards participatory learning.</p> <p>- to practice cooperative learning to achieve the goals them,</p> <p>- to take initiative and develop their creative and critical thinking and dialogue.</p>
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Source: Authors, 2024

### 3.4.2. Duration

It is estimated that the duration of the teaching scenario will be 2 teaching hours.

### 3.4.3. Class organization – required hardware infrastructure

Teaching media - learning materials

- PC, laptop, interactive whiteboard, video projector, and printer are available in the school classroom. For the duration of the course, the PC and laptop can be linked.
- The following media must be used: software ("ROUNDS WITH VALUE"), the Internet, YouTube, Tux Paint, and a worksheet in doc format; also, there should be a cash register (game) with coins, things with cost tags, and

Four pupils in the department have mastered the use of computers. Of them, two have mastered writing and reading mechanics. Owing to the unique needs of each student, certain activities will involve pairs of individuals, while others will involve one-on-one instruction.

### 3.4.4. Description and justification of the activities

The goal of new pedagogy is student-centered instruction, where students actively participate in their education and teachers act as their mentors, advisers, and motivators as they explore, conquer, and create knowledge. When used in conjunction with traditional teaching methods, ICT use in the classroom is seen as a valuable tool. The aforementioned information points us toward the opportunities that students have when they use ICT in the classroom, including their familiarity with the technology, their use as learning resources and tools, and their ability to develop cooperative and exploratory learning skills. Additionally, the "method" of video self-modeling will be used.

The following serves as the scenario's fictitious foundation:

- In the constructivist method developed by Piaget, Bruner, and Vygotsky, knowledge is gradually built through students' creative activities, discovery, and cooperative learning.
- Guided inquiry, which involves students following instructions and participating in cooperative and exploratory activities; • Teamwork; • experience learning through ICT-based discovery learning (with relevant tours, movies, and photographs to give students a sense of experience learning)

Each student receives a worksheet individually, completes it with their entire group of two, and then presents it to the class as a whole.

The teaching follows the following structure:

- It is charged with the money given by the students to "buy" the school photos.
- Watch video:

<https://www.youtube.com/watch?v=szF9Sq6pKu0>



Figure 1 Introduction to Coins

-Students are asked to watch a video about coins (also shown on the interactive whiteboard)

- We navigate to the website.

<https://www.mathsisfun.com/money/money-master.html>

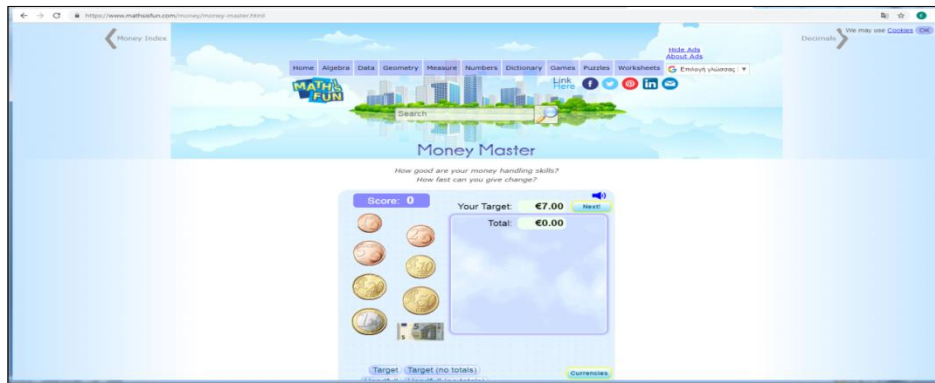


Figure 2 Counting Euros

-Students are asked to count the euros (online)

- We navigate to the website:

<https://blogs.sch.gr/echorian/%CE%B4%CE%B7%CE%BC%CE%BF%CF%84%CE%B9%CE%BA%CF%8C/%CE%B2-%CE%B4%CE%B7%CE%BC%CE%BF%CF%84%CE%B9%CE%BA%CE%BF%CF%8D/%CE%BC%CE%B1%CE%B8%CE%B1%CE%AF%CE%BD%CE%BF%CF%85%CE%BC%CE%B5-%CF%84%CE%B1-%CE%BA%CE%AD%CF%81%CE%BC%CE%B1%CF%84%CE%B1-%CF%84%CE%BF%CF%85-%CE%B5%CF%85%CF%81%CF%8E>



**Figure 3** Calculating Euros

The students are asked to calculate the euros! (game- online)

- Students are asked to form groups.
- "ROUND WITH VALUE" software



**Figure 4** Familiarization with money learning activities

Students are asked to complete the task in the Rounds with Value Software (familiar money learning activities): We give money, we buy products.

### 3.5. Evaluation of Students

- Are students given problems where they are asked to use the cash register the money and products to play the game? The seller-buyer asks to form the price of the Products, give change, etc. (following the logic of the VSM example).
- Students are videotaped in their activity.
- -Finally, we all go to the canteen together and buy products in real conditions that are again videotaped.
- -We all watch the video recording and there is a discussion (feedback).

## 4. Results

By using activities in real-world contexts, differentiated instruction, experiential learning, and exploration were implemented, and the goals established at the outset of the m-scenario were met. To distribute money (coins and banknotes), teach pupils the value of money, and prepare them for using it in everyday situations, the students collaborated.

## 5. Conclusion

Lastly, it is important to emphasize the constructive and successful role that digital technologies play in education. They make assessment and intervention easier and more effective. The work's evaluations make it evident that differentiated

instruction, tpe through experiential learning, discovery learning, and tactile teaching methods all contribute to students' improved understanding of arithmetic concepts and their ability to approach and perform mathematical operations.

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## Compliance with ethical standards

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The Authors proclaim no conflict of interest.

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