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GAME BASED LEARNING "HUMAN BODY" IN GREEK PRIMARY SCHOOL STUDENTS

Abstract:

The aim of this study is to make "the human body" more friendly to primary school students. Differentiated teaching and distance game – based teaching is not familiar to Schools (teachers and students). This survey is an innovation for the Greek Education and makes a teaching proposal in this field. The proposal is about "the human body" and how children 6-12 years old learn to use them in their everyday life. It is known that children in these ages of 6-12 years are not familiar enough with the human body. The game is designed by a large trans-disciplinary research team from different Universities in Greece. The research team consists of mathematicians, geologists, physicists, chemists, computer scientists, doctors and biologists. The game – based teaching guides children to learn with fun and solve problems in all school subjects, this study focus in "Human Body". The teaching proposal is based on the students' books of the primary school. The primary school students prefer the game-based learning, they learn easily and pleasantly. It is an initial research that started in 2021 and will be completed in 2023. The aim is to expand to all levels of education and to become the main teaching method for all students in schools.

Keywords:

Game-based learning, problem solving, primary education, human body

JEL Classification: I29, I21

1.   Introduction

The aim of this study is to make human body more amicable (agreeable) to primary school students. Distance game – based teaching is not familiar to the most European Schools (teachers and students). This survey is an innovation for the Greek Education and makes a teaching proposal in this field. The proposal is about human body and how children 6-12 years old learn about it. The teaching proposal is based on the students' books of the primary school. The game – based teaching guides children to learn with fun. Pedagogy is at the heart of teaching and learning. Preparing young people to become lifelong learners with a deep knowledge of subject matter and a broad set of social skills requires a better understanding of how pedagogy influences learning (Skiadas al. 2021). Focusing on pedagogies shifts the perception of teachers from technicians who strive to attain the education goals set by the curriculum to experts in the art and science of teaching. (Paniagua, Al.; Istance, D., 2018)

A new project named "KIDEDU" (Play Create Learn) was designed and implemented by a research team of the University of Piraeus and a large trans-disciplinary research team. The proposed object is the creation of 3D animation interactive game through which children aged 6-12 years will learn "Everyday Arithmetic" and "Planet Earth" in a very innovative way without the use of books, notebooks, pencils and blackboards but only with the use of sophisticated digital technology presented simply and friendly to attract children to learn indirectly through guided exploratory learning while spending their time happily. Every theory of learning is based on certain conditions and principles for the way a person learns. Every learning involves experiences and stimuli from the environment, as well as certain mental processes. So the main question for learning is what happens in relation to the stimuli of the environment and what processes happen in the mind in order to achieve learning (Skiadas al. 2021).

The exploratory approach, as a basic principle, is supported by most educators, because it activates children and makes them participants in the learning process. The effectiveness of the discovery approach in specific circumstances has been extensively discussed. Educators and learning psychologists seem to be divided between two views: The one is learning through discovery with minimal guidance from the instructor and providing great opportunities for children to explore and experiment and and the other is guided learning with carefully structured sequences of teaching steps and maximum guidance from the instructor.

1.   Theoretical framework about the role of the teacher in Differentiated Teaching

Many people argue that the role of the teacher in a differentiated classroom differs significantly from the role of a more traditional teacher. They do not see the lesson as a sterile transfer of knowledge, they focus on their students trying to explore them. It is a kind of reading for students so that they can understand their weaknesses, talents, inclinations, interests, skills and concerns. Through this process the teacher becomes both a student and an organizer as he has to plan his lesson finding ways to highlight and deal with everything he has diagnosed, without excluding any student, creating equal opportunities for all. The differentiated classroom is transformed daily into an exploration space for both the student and the teacher. No teacher should forget that a teaching strategy becomes optimal if and only if it works for each student. For example, every lesson that fascinates and arouses the interest of the class does not necessarily mean that it will be understood by all students. At this point a confusion is created. The teacher must with many approaches try to meet the

needs of all students without this implying that he must constantly teach all things to everyone.

According to Ann Tomlison (2001) the teacher in a differentiated classroom becomes more capable when
- first creates ways to properly gather information, ideas and data about everyone
- secondly it makes a correct reading - interpretation of the preferences, interests and weaknesses for each student,
- third, it continuously evaluates in various ways to identify the weaknesses that each student has
- fourthly, he designs and develops the lesson in many different ways so that each student can perceive and understand the new concepts and theories, but also can express - expand his views - perceptions.

But how many of the teachers know enough to guide a class that consists of students with many and big differences and to meet its real needs? In a differentiated classroom, teachers consciously and inevitably evolve over time in some of their skills, which makes them more capable. They always organize the lesson based on the curriculum, focusing essentially, they treat each student not as an individual but as a separate group. They distinguish more easily and quickly the skills, interests, weaknesses and generally the level of knowledge of each student without standing on stereotypes, simply knowing more and better each student each time minimizing the distance between them. They allow the student to think and express themselves more freely, to take initiatives while they are by his side to guide him whenever he needs to, creating an atmosphere of security and at the same time a sense of freedom in the classroom. They share the lesson with the students. They anticipate what could go wrong and avoid this error in a timely manner by not assigning tasks and activities whose content would lead to problematic situations and not to legitimate results. They use more user-friendly tools (materials, tools, etc.) for their teaching, utilizing time with greater flexibility.

From the teacher's point of view, we need to recognize and understand as well as possible some general and basic instructions that must be followed in a mixed ability class to achieve differentiation. The lessons should be made as attractive as possible for all students, which is not always possible, however it continues to be the main goal for the development - optimization of a teacher. All students need to take the time to understand and practice new knowledge. It is not uncommon for advanced students and those who work hard to get bored to need less time than others, making the lesson unattractive to them. Means, Chelemer, & Knapp, 1991 concluded that hard-working students took the learning process more for granted when their teacher assigned them issues they were seeing for the first time, which required knowledge beyond what was needed to deal with them. they had already acquired.

Not many students have in their minds a lot of information in order - knowledge in such a way that at any time they can use it selectively where needed. The large volume of information has always been a headache for the students but also for the teacher who struggles with time to cover it. Possibly if we avoided all this and focused more on the basic concepts and the deeper meaning without wasting time on talkative details, the students would have gained more. The basic concepts are necessary and function as a foundation in the building that we try to assemble for all students. The question that arises is whether the basic concepts that they would acquire are sufficient for the understanding of future knowledge? How deep could they lead them? The teacher should plan the lesson with such a strategy that he is clear in what he teaches, to insist first on understanding the basic concepts and definitions that are necessary for the teaching of the paragraph or the corresponding chapter and when he ensures it then to go into more detail. For this reason every time a unit ends it

is good to go back to check what they have understood and what not and to help the students to perform to the maximum.

Each lesson is a new path that students and a teacher must cross together. The teacher should move in axes that help students develop critical thinking. This is certainly not easy for all students, but it is always the final destination of the journey for both of them.

There are classes where some students have difficulty delivering, others in managing and completing the tasks assigned to them, there may be students with learning difficulties. The teacher must quickly diagnose the above issues. He may need to use appropriate arguments or examples to support those who do not understand or have questions of understanding. Always a small summary helps to better understand, even if it is the lesson of the day. Also, the tasks he will assign should not be of a low level. It goes without saying that they should first examine basic knowledge in depth and not be limited to just memorizing, then assessing students on more complex topics that require more thought. The teacher should give the opportunity to each student to be evaluated in such a way as to allow him to express himself and to prove his true value and level of knowledge. In special cases, some students have difficulty with the written exams while performing better orally, which is why they may need to be assessed in the second way. Assessment must be continuous for each student and everything must be taken into account. From the work they do, the participation in the class not only at the level of knowledge but also from the discussions within the class. Continuous assessment helps the teacher to distinguish what has been understood and what has not, redefining the lesson plan to solve the problem.

2. Inhibitory factors - obstacles to the implementation of Differentiated teaching

Ann Tomlinson (1995) describes barriers to differentiation as teachers' fears. Fear because this is an unprecedented and more complex process for them in which they are called to manage at the same time each student or group of students in a different way. There is no golden rule to rely on. Fear because they may lose control of students in many areas, from delivery to assessment. Benjamin (2002) states that differentiation abandons the traditional process and tries to redefine a new way of learning. Differentiated teaching deals mainly with students who are not so good at learning. In essence, the more advanced students become the means of teaching the weaker ones. In a differentiated class, the students are divided individually or in groups according to the needs, but that a teacher is so sure that the way he will distribute them to the respective groups is appropriate. Carolan & Guinn (2007) argued that teachers' needs for differentiated teaching are greater. Lack of time is the permanent obstacle. Teachers are not properly trained in this area so that the system itself can develop them. They do not always have the necessary equipment or materials needed for the lesson. Finally, several times they need help from other specialties such as sociologists, psychologists, administrators, etc., with the result that teachers remain helpless and frustrated seeing the course as a mandatory and procedural task.

3. KIDEDU project

A project named "KIDEDU" (Play Create Learn) designed and implemented by a research team of the University of Piraeus and a large trans-disciplinary research team. The proposed object is the creation of 3D animation interactive games through children aged 6-12 years who learn basic concepts for the sections "Planet Earth" and "The Arithmetic of Everyday Life" in a very innovative way without the use of books, notebooks, pencils. or blackboard but only with the use of high level digital technology presented simply and attractively to attract children to learn indirectly through guided exploratory learning while spending their time happily. During the game, narration and transfer of basic knowledge takes place, where this

is deemed necessary by children, so that the voice that is heard is popular and does not refer to the voice of a teacher but to the voice of a friend - their classmate.

4. Learning based on the use of digital play – The Human Body

One of the sections of the game is the "human body", as well as its goals, according to the level of knowledge that children aged 6-12 (Primary School students) should have is the following: **Human Body.**

The hero is a small child of about 7 years old who learns about the human body. He lives with his family in a house (we see figure 1 of his bathroom and figure 5 of his room).

An adventure begins in order to reach a castle. on his way he encounters various challenges that he must meet in order to reach his destination.

The goals are:
- to know the parts of the human body
- to recognize how the systems of the human body and organs work
- to explain the importance of a balanced diet
- to distinguish germs and to understand the prevention and treatment of diseases
- to understand the importance of personal hygiene
- to know the principle of life and the reproductive system.

Personal hygiene is the care of the body.

It aims to prevent disease, maintain our health and improve relationships with other children and the world at large.

Personal hygiene includes cleanliness of the body, hands and feet, oral hygiene and good sleep.

Then he shows with pictures: How do I take care of myself? How I stay healthy:

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Figure 1: photo of the Hero's bathroom

Figure 2: photo of the activities

I am healthy when:

I eat a good breakfast, fruits, vegetables, legumes, fish, chicken, red meat and not many sweets to get the necessary vitamins for my body.

I sleep to rest my body.

I exercise with play or sports activities to stay in good physical condition.

I wash to remove germs from my body.

I brush my teeth to avoid tooth decay and keep them clean and strong.

I get all the necessary vaccines to protect my body from dangerous diseases.

Then he goes into the bathroom to get ready:

When he brushes his teeth, the narrator says:

Proper brushing should clean teeth, gums and tongue from food debris and remove germs.

Instructions for brushing teeth

Proper brushing of teeth requires at least 2-3 minutes.

For proper brushing of teeth, use soft, circular motions paying special attention to the border between teeth and gums

Brush 2-3 teeth at a time, counting to 10 (about 10 seconds). I clean the tongue.

Figure 3: photo of the cleaning teeth application

"Diet"

The narrator says: Our daily diet should be healthy, balanced and include a variety of foods in the right amount.

He opens the fridge and the cupboard to choose his breakfast:

E.g. The fridge has: milk, yogurt, soft drink, butter, eggs, fruit juice, chocolate, sweets

The cupboard has: bread, cereals, spaghetti, rice, cookies, honey, chips, croissants, fruit

The hero makes his breakfast:

E.g. Milk with cereals, slice of bread with butter and honey

Yogurt with honey, egg, fruit juice

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When he chooses the product it will be good to look with a photo that helps him. E.g. milk, yogurt - strong bones, bread, cereals - energy, fruit – vitamins

Figure 4: photo of the Hero's kitchen

During his journey in the forest he forms a bridge with the parts of the human body to continue his course or to cross it an elf asks him to repair the human body after he is given his various parts scattered.

I know my body

The narrator says:

The human body consists of:

Head

The hair and the face are on the head.

On the face there are the forehead, two eyes, two ears, the nose, two cheeks and the mouth. The mouth consists of the lips, tongue, teeth and gums.

The head is supported by the neck.

Neck

Trunk

In the trunk there are the shoulders, the chest, the abdomen

Upper limbs - hands

In the upper extremities - hands there is the elbow, wrist, palm and fingers

Lower limbs - legs

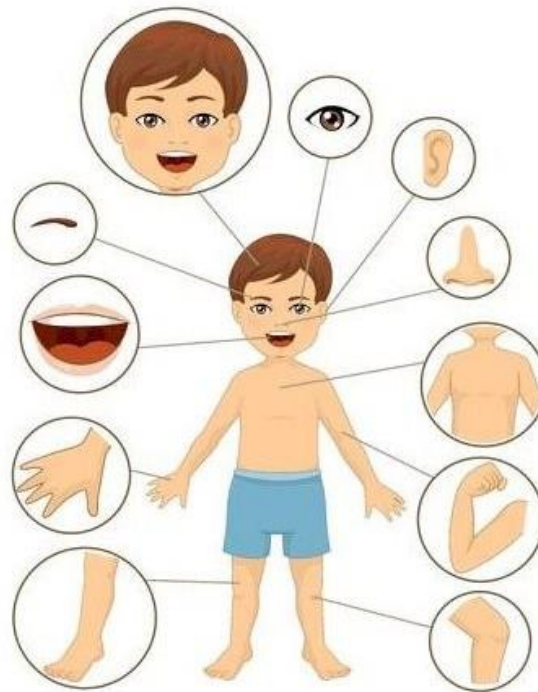In the lower extremities - legs are the knee, sole and toes.

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Figure 5: photo of the human body

The hero perceives the environment using his 5 senses:

The narrator explains:

The system of sensory organs

• Helps the body to perceive and communicate with the environment

• The senses are five: smell, taste (sour, sweet, salty, bitter), sight, touch and hearing.

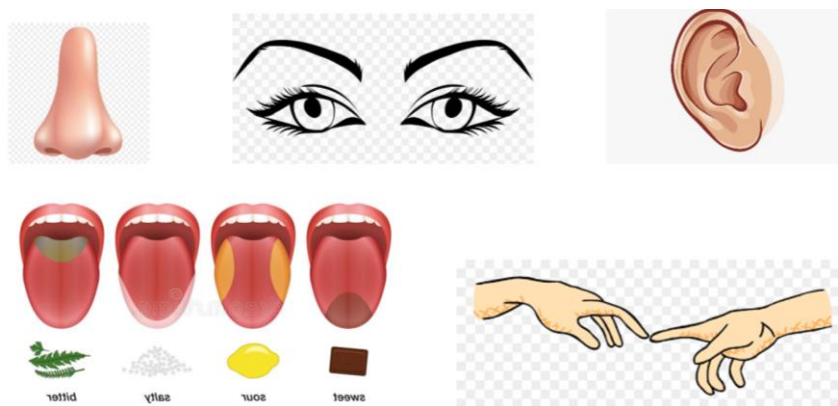• The sensory organs that serve the five senses are respectively: nose, tongue, eyes, skin, ear.

Figure 6: photos from parts of the body

Aim to combine the instrument with the feel

Table 1: Organs and Senses

Body organs		Senses
eyes	I see	Vision
Ears	I hear	Hearing
Nose	I Smell	Smell
tongue	I Taste	Taste
Skin	I Touch	Touch

Figure 7: photo of the hero's bedroom

5. Conclusion and Discussion

Digital game-based learning applications quickly penetrated all levels of childhood and student life, targeting preschoolers to graduate students. Surely one can criticize the design, the methods, the means, and even the motivations of the creators of these applications and many do. The point is not to take our children away from computers - if they really want to be there, they will find a way to do it even behind our backs - but to try to make their engagement creative. This is something completely different from television, where the means of production were very expensive and control was concentrated in the hands of very few. As we all realize - including children and teachers - creating educational examples based on digital play makes learning enjoyable. The children, together with their teachers, have already started implementing pilot programs. Our task is to encourage them, to work with them and to help them combine their new learning style with what we know about learning and life.

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Educational software development is at a very early stage in Greece and Europe. The rigid educational system along with the insufficient teacher training in new technologies make the task of incorporating new software applications in the teaching process difficult. Both aspects of new technologies use in pedagogy provide a real increase in the quality of education. The results of this study suggest beneficial effects of implementing new technologies' enhancements. Clarity in presentation, along with enthusiasm and respect towards student views had the greatest positive influence on lesson evaluation by students (Skiadas al. 2021).

Students' effort plays a key role to obtaining high grades. Students claiming to have tried harder at a module acquired higher grades. Thus, we could support that tension and the total amount of time spent on studying affects the learning. Teaching assisted by games and computers is almost as effective as conventional teaching but probably costs more. Computer based study systems appear to be more effective than game and simulations especially for students of weaker performance. Educational programmes are effective because students can reach a standard level of qualification sufficiency in less time but students are not very fond of them. Students enjoy being taught according to their personal style and this increases performance in some cases. In general research results show that the advantages of applying the use of computers in teaching. Students prefer computer-based lessons over traditional lessons to a very high percentage.

Acknowledgment

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