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Environmental education in light of the digital culture

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Abstract

The importance of environmental education cannot be stressed enough as humanity populated the majority of the Earth and its activity effects the whole planet. Environmental education is lifestyle education that cannot be started early enough. The point is not only to properly provide scientific knowledge besides personality development. It is essential that children discover and understand cause and effect relationships so they will understand the processes on the whole. The processes leading to the solutions of environmental questions and problems can link different subjects, can build a global point of view suitable to be supported by digital culture for more reasons. The present article in addition to the definition of concepts of environmental education and its practical implementation, describes the accentuated role and possibilities of the digital culture subject in the process of education for sustainability and it provides concrete tasks by age groups along with detailed methodological guidance.

Keywords: sustainable society; environmental education; legal regulation; educational roles; digital culture; thematic project tasks; global point of view; STEM; robot programming; scratch

1. Introduction and the relevant professional context

The idea of environmental education was first formulated in developed Western societies. The ever-increasing population density has resulted not only in unmanageable amounts of waste, but also in serious health problems due to air and water pollution, among other things. The unsustainable situation needed immediate and effective remedy. Environmental movements were born, later interventions on the legislative level were needed to avoid even more serious problems.

Hungary was hit by this so-called "green wave" in the early 1990s. Environmental and nature protection movements and associations were organized, and the promotion of environmentally conscious thinking affecting all areas of life began.

Today, environmental education is widely known and accepted. It can be found in all areas of education, which is particularly important because environmental education provides the basis

for understanding and clarifying the short - and long - term consequences of consumer society. And this can never be started early enough.

In addition to the transfer of scientific knowledge, environmental education should also promote civic education and personality development purposes.

According to Pál Rókusfalvy, personality development is realized in environmental education through the solution of similar tasks as in any other field, such as mother tongue and mathematics education. The respective tasks include:

1. knowledge provision,

2. attitude formation,

3. behaviour formation.

"Without the provision of knowledge and the formation of attitudes, however, requiring action is merely an ineffective dressage, just as in the absence of a correct, orderly approach, the provision of knowledge remains a mere verbalization. The learner must learn to think so that he can do the right thing using his knowledge." (Rókusfalvy, 2000)

In my article, I examine solution options related to an environmental education program in a primary school in light of the support provided by the subject of digital culture. With these three areas in mind, I would like to present such procedures and methods that show that the institutional environmental education program can be effectively implemented within the framework of the subject of digital culture.

I believe that primary school environmental education is of paramount importance, as it is perhaps the best opportunity to instil in children the spirit of a sustainable society, to familiarize them with its practical foundations. On the other hand children will be the conscious consumers of the future, so the evolution of society's environmental values depends on them, consequently early environmental education is essential!

Perhaps one of the biggest challenges education is facing is to achieve that children’s environmentally conscious behaviour stems from unconditional, full inner conviction. Therefore educational processes must steer their thinking in the direction that their daily actions also serve sustainability. Thus, educators have a prominent role in training environmentally conscious citizens, making environmental protection their most important priority.

2. Theoretical background

2.1. Purpose and importance of environmental education

The aim of environmental education is to develop environmentally conscious behaviour and to establish a lifestyle that is responsible for the environment. In addition to expanding the knowledge that can be developed about the environment and society, it also aims to shape the behaviour, values and emotional attitudes connected to it The intellectual and moral foundation of the system of customs that respect nature, the environment and man is aimed at the preservation and maintenance of the biosphere - and human societies in it. (Havas, n.d.)

The aim is therefore to develop an environmentally conscious view, skills, abilities and relevant positive attitudes. It is visible that this is a complex task that is not limited to a single field, as it may have scientific, artistic and other aspects too. In conclusion, it cannot be linked to a single subject; it can be incorporated into the material of natural science subjects as well as into the subjects of humanities. Environmental education is effective if it permeates the whole personality, if - in addition to the acquisition of knowledge and experience - it also exerts its effect in the field of attitudes, sentimental orientation and behaviours. It should also arouse interest and curiosity, unfold the imagination, allow time for joyful wonder, admiration, and enjoyment of beauty. (Orgoványi, n.d.)

As János Lehoczky (1999) put it:

“The goal of environmental education is multi-layered, not just the transfer of environmental knowledge. It seeks to influence the whole of the personality, including consciousness through knowledge, sentiments through experience, and the will through purposeful activities.”

Environmental education is vital for the preservation of the natural environment, but also for the development of the child's whole personality, as it also helps to develop self-image and a sense of personal responsibility. Environmental education should be a value mediator where, in addition to knowledge, feeling is also present. The goal is for the child to pay attention to the beauty of nature, and its fragile balance, while developing a sense of compassion, regret, admiration, and love. This kind of knowledge helps the child to understand his place in nature. He realizes that he is also part of nature and does not exist out of it. This recognition not only enriches the child’s personality, but can also contribute to the preservation of the values of nature. (Wilson, 1994)

Recognition of natural values and the ability to deal with environmental problems also serve the development of ecological culture.

It is therefore essential to pass on knowledge that is new and has ecological point of view via education. It is extremely important that the accumulated knowledge, experience and values are passed on to future generations. The content of education cannot refer only to the past. An essential element must be the establishment and development of the skills and abilities needed to plan and live for the future. As can be seen, this already points in the direction of the so-called sustainability education, where orientation to the future appears as an important feature.

2.2. Education for sustainability

Sustainable development is a relatively well-known term. In reality, however, it is an extremely controversial concept, so let us address the definition itself before discussing education for sustainability. According to the 1987 Brundtland Report of the United Nations sustainable development is a process that "meets the needs of the present without compromising the ability of future generations to meet their own needs".

It has the further task of determining the outlines of environmental protection, but it must "achieve this without sacrificing the needs of either economic development or social equality and justice." (Wikipedia)

The principle of sustainable development has been widely criticized, as it does matter from which angle we examine and use the phrase. Economic development presupposes the constant consumption of resources, but many resources, such as oil and natural gas, are consumed by humanity at a much faster rate than they are naturally regenerated, resulting in dwindling supplies. From another point of view, it can be considered a counterargument holding that sustainability cannot be applied to the current kind of economic development. Another possible interpretation by a social group implies sustained economic growth, but since the economy is based on the use of natural resources, this is not possible in principle, as the Earth is of finite size.

It therefore seems more appropriate to use the term sustainable society, which aims to create a system in which natural, social and economic goals are not achieved at the expense of each other, but in support of each other.

Perhaps one of the most important messages in the definitions of sustainable development, of a sustainable society, is that we all have to respect natural values here and now, all of us have to be more frugal with the raw materials of our planet here and now.

That is why we all need to do something here and now. (Láng, 2002) We must live without restricting the living conditions of future generations, depriving them of the opportunity to live a life of at least the same quality, or possibly even better than we do. To do this, we need to fundamentally rethink our current way of life, our values, the relationship between man and his environment. It should be understood that value can not only be expressed in money or be something that is purchased. We must not use nature's raw materials in such a way that, from its source, through production and use, it becomes exclusively waste and can no longer be used. We produce and use our goods in a way that fits into the natural cycles, allows existing material to be reused again and again, and does not lead to the final depletion of natural resources. (Kiss, 1999)

Every person can do something for this, but we have to realize that it is very difficult to change a comfortable lifestyle, fixed habits. The solution is in the individual, in the family, in small groups who feel responsible for each other and our environment. (Havas, n.d.)

2.3. The role of the individual, the society and the institution in sustainability

Nowadays, there are many channels that can be used to draw the attention of all members of society to the importance of sustainability, just think of the possibilities of the media, jobs and many community activities. According to Ágnes Kertész, individuals can contribute to sustainability, among other things, by cultivating themselves continuously throughout their lives, studying the environmental, social and natural values that determine their daily lives. (Kertész, 2010) Despite the fact that parents pass on their acquired knowledge to their children, the values and attitudes of individuals can be very different. This is why there is a need for intervention at the institutional level, which is one of the very important stages of education for sustainability.

In the course of education for sustainability, it is necessary to understand the essence of the concept of a sustainable society, i.e. the relationship, connections and interdependence of man and his environment. The key step of the process is the acquisition of knowledge in various fields.

Sustainability has to emerge in all areas of life, and thus play a key role at all levels and in all forms of education. (Kiss, 1999)

Environmental education is a process where not only knowledge and skills need to be developed, but also environmental awareness, value judgment, responsibility, behaviours and sensitivity. Accordingly, the pedagogy of sustainability expands the main guidelines of environmental education with a number of factors, emphasizes attention to the actions of the present and their expected future consequences. The aim is to create a set of values that highly classify sustainability-related activities as attractive and desirable for the future. An important aspect in education is to reflect the different cultural approach to sustainability. (Juhász and Radócz, 2000)

According to the National Core Curriculum, aspects of environmental education must be reflected in all subjects. However, this alone is not enough. As Péter Havas explains in one of his works, in terms of sustainable development, subjects at all levels of education must be closely interrelated. (Havas, 2001)

By focusing on solving a given problem, the boundaries between different disciplines disappear, as we examine the same problem only by approaching it from several different aspects. At the same time, it is necessary to incorporate the elements essential for teaching the environment and sustainability into the knowledge base, methodology and daily practice of teachers. Consequently, the development of teachers' competence is also essential for successful environmental education.

2.4. Legal regulation of environmental education

Pursuant to Section 48 (3) of the Hungarian Act LXV of 2003 Amending Act LXXIX of 1993 on public education, schools must also prepare their environmental education program as part of their educational program. The law also defines the purpose of environmental education and its elements.

"The overarching goal of environmental education is to promote the development of students' environmentally conscious behaviours and lifestyles in order to enable the growing generation to prevent the deepening of the environmental crisis, promoting the survival of living nature and the sustainable development of societies." (243/2003. (XII. 17.))

"In the course of environmental education, students should learn about the current processes that result in the environmental crisis phenomena on our planet. Students should recognize the positive and negative environmental consequences of socio-economic modernization via

concrete domestic examples. Students should be involved in preserving and enriching the values of their immediate environment. Respect for nature, responsibility and the prevention of environmental damage should become decisive in their way of life. Students should gain personal experience in cooperation, joint management and resolution of environmental conflicts." (243/2003. (XII. 17.))

With the introduction of the National Core Curriculum, the guarantees of institutional environmental education were created. (Orgoványi, n.d.) The NAT-2020 document reflects a number of modern pedagogical principles and meets internationally relevant requirements for the expectations of 21st century education. (Nahalka, 2020)

The content specified in the law must gradually appear in primary school education, as a result of which, after leaving school, students can be expected to understand and be able to integrate into their own lives and everyday lives such concepts as the principle of sustainability, the limits of growth, recognizing and understanding interdependence, the principle of precaution, or basic human needs.

3. Practical implementation of institutional environmental education

3.1. Institutional environmental education

The aim of environmental education is to train people who are environmentally conscious, pay attention to their environment, live in harmony with it, and have the appropriate knowledge, attitude and motivation to do so. The task of the environmental education process is therefore to provide the knowledge, skills and commitment needed to protect the environment. Its main goal is to develop a corresponding value system and pattern of behaviour in people.

In the case of institutions, environmental education prevails as defined in the pedagogical program. As an example, in the following few lines, I present the environmental education program of the Várkerti Primary School and Associate Schools.

„We strive to create a nature-friendly microenvironment at school. We want to make our students sensitive to the state of their environment. This is also our priority as an ECO school.

Our goal is to enable our students to protect the environment, thereby promoting the survival of living nature and the sustainable development of societies. Respect for nature, responsibility and prevention of environmental damage should become decisive in their lifestyle.

The rising generation needs to know and appreciate the rich diversity of life forms in nature and culture. They need to learn to use resources consciously, sparingly and responsibly, with regard

to their regenerative capacity. The aim is environment-friendly, value-based, and sustainable behaviour based on knowledge and love of nature and the environment to become decisive for students. The institution should endeavour that students get acquainted with the economic and social processes that can cause changes and crises, furthermore help them to get involved in the preservation and enrichment of the values and diversity of their immediate and wider environment.

Our long-term goal and vision is for our students to become environmentally conscious citizens.

In order to this we need to develop in our students:

- environment conscious behaviour and lifestyle
- environmentally friendly, frugal behaviour and lifestyle based on personal responsibility
- responsible behaviour towards the values of the environment (natural and artificial), the need and will to preserve it
- love and protection of the natural and built environment, preservation of diversity
- system approach
- scientific ground for understanding global contexts
- the need for a healthy lifestyle and to master the techniques and methods leading to it.

We consider our pivotal task to shape the attitude of the students, to form and consolidate their love of the environment and nature." (Pedagogical program of Várkerti)

3.2. Sites of practical implementation

The practical implementation of environmental education is determined by the local programs of schools (Havas, Széplaki, Varga, 2004). All Hungarian schools are affected by the environmental education program, as it is regulated by law. The schools, however, determine individually which students will receive environmental education, when and how. As a result, we may even encounter significantly different environmental education practices from school to school.

For example, the environmental education arenas of the Várkerti Primary School and its member schools are listed below (Pedagogical Program of Várkerti):

a) lessons, out of classroom lessons

b) extracurricular activities

- day care activities
- study group promoting environmental awareness
- nature research camp
- excursions, study trips, field trips
- forest school
- celebration of special days
- quizzes, environmental education campaigns, academic tender competition
- school garden, schoolyard
- cleanliness and order of classrooms

3.3. Environmental education in light of the digital culture

Undoubtedly, one of the most defining trends of today is digitalization, which also reforms education and the process of acquiring knowledge. Although the possibilities for learning and research experience and effectiveness seem limitless today, putting these possibilities into practice is currently a real challenge. Generation Z members who are true "digital natives" have appeared on the scene of education. They grow up so that the major achievements of the recent technology are now readily available to them (Prensky 2001). Therefore we can understand that they have new expectations in relation to education, and we can address and reach them in a different way than before. For them, learning does not end in frontal classroom work exclusively within the walls of the institution, but takes place informally, through the incorporation of interactive processes.

One of the essential aspects of environmental education is the acquisition of scientific knowledge, but perhaps even more important is the educational process aiming at exploring connections. The discovery and understanding of cause and effect relationships leads to the discovery of problems that may arise during the processes, to their complex understanding and then to their effective solution. The development of STEM skills - i.e. the ability to ensure the coordinated application of the four disciplines: science, technology, engineering and mathematics - and the development of closely related competencies and characteristics directly contribute to the promotion of environmental awareness and attitude.

The latest Vocational Training 4.0 strategy reiterates that the Hungarian economic sphere needs engineers, and experts with informatics and natural science background. Graduates with MTMI skills can be prepared to achieve success in the labour market via STEM oriented skill development programs delivered by enterprises. Such training programs and the latest vocational training-related initiatives aim to achieve a 40% rate in the enrolment in such programs among students applying to higher education (Molnár et al, 2019).

The particularity of the digital culture subject is that it is especially suitable not only for the development of STEM skills, but also for the establishment and development of algorithmic thinking, which are indispensable elements for the recognition and effective solution of environmental issues and problems. During the lessons, the development of visual education, technique, creativity, logic and thinking in three dimensions will play a role. In the field of sustainability, the children work with thematic project tasks, in the solution of which the boundaries between the different disciplines disappear, the global vision is formed, connections and interrelationships become apparent, through which the interoperability between subjects is realized (Lükő, 2017).

During particular tasks related to environmental education, the main goal is to develop students' awareness of the environment and their way of life: pay more attention to their daily habits regarding the environment, such as energy or water consumption, waste management, and their relationship with living nature in general. It is important that all these activities are driven by intrinsic motivation.

The digital culture subject appears in the 3rd year of primary school education, so it can support the process of education for sustainability already in the lower grades.

Based on the content of the subjects, the possibilities of environmental education in the lower grades can be expressed mostly in the subjects of environmental knowledge, visual culture, technique, lifestyle and practice, but of course it can also play a role in other subjects at different levels. In the upper grades, natural sciences, physics, chemistry, biology, our earth and environment, as well as technology and lifestyle subjects have the opportunity to expand environmental education.

Within the framework of the digital culture subject, we can support environmental education in the younger age groups typically by creating simpler digital texts and figures, as well as presentations about the topic of nature and the environment. In case of upper grades, our toolbox is already expanding considerably, as we can use the help of block programming, robotics and

possibilities of other software applications, such as simple data processing, creation of graphs and charts.

There are plenty of subjects and topics related to the protection of environment and health. The question may arise that which topics are worth processing in digital form in the first place.

Knowledge acquired through the senses is essential for the development of symbolic thinking. All this plays a crucial role in getting to know the environment. It is necessary to involve all the senses in the process, because only in this way does the student receive complex information about the interaction and its elements. Knowledge is contained in the feelings received through the senses; from here it is transformed into knowledge during logical processing, and then into understood, independently constructed knowledge. (Nagy, 2018)

Today, there are plenty of technological tools that can help the teaching-learning process as the digital equipment of schools is constantly improving. A digital tablet, desktop computer, laptop, tablet, smartphone, VR goggles, floor robot, smart gloves, 3D printer and many more devices can be available.

With sufficient wisdom, these tools can significantly improve the efficiency of the learning-teaching process. However, we must not forget that even the most advanced digital technology cannot fully represent reality itself!

Digital tools used as tools in the process of scientific cognition (observation, experiment, measurement) can make processing and application more efficient, but they cannot provide more and easier to process knowledge than the living natural environment itself.

Knowing these, it is worth thinking about when digital technology can be used effectively in the teaching of individual topics.

Considering the aspects described, digital technology can be used well to review each topic and to systematize the knowledge. It allows students to create relationships more quickly, a process that also serves fixing. The most expedient method is to create a digital presentation or drawing related to the chosen topic. The relevant tasks are in the sections of the annexes entitled ‘A. Task”.

Demonstrating the relationship between learned knowledge and the interactions of everyday life is essential for understanding. In this case, too, a live, action-oriented presentation should be preferred, but the space and time constraints, or the content and extent of the curriculum, do

not always allow for this (e.g. the surface construction and destruction of rivers, the operation and effects of power plants, etc.).

In such cases, the support provided by digital tools helps to show the correlations related to everyday life and to the interactions that take place in nature.

In the case of the topic of the second annex (water cycle, forms of appearance in nature), the mentioned content and extent can be a fundamental obstacle, but with the help of the proposed application we can make it simple and easy to understand. For the lower age group, the GCompris application helps the understanding; in the upper grade we can optionally model the process with the help of program code.

Fig. 1. Paddleboat, Source: GCompris

In case of the fourth (observation of wildlife in the immediate environment) and ninth (transport) topics, space and time constraints and narrowing of opportunities may hamper the process of full understanding. In this case, we can also support the acquisition of the curriculum, even by creating program code. Moreover, in connection with this, as a toolbox of experiential pedagogy, we can enrich the relevant topic with a robotics task.

Fig. 2. LEGO BOOST, Source: Mikrobisuli accredited talent development workshop / robopet project / own image

There are cases where the demonstration of an interaction is dangerous or costly, such as the possibilities of material creation (annex 5), in which cases the applicability of digital technology is also clear.

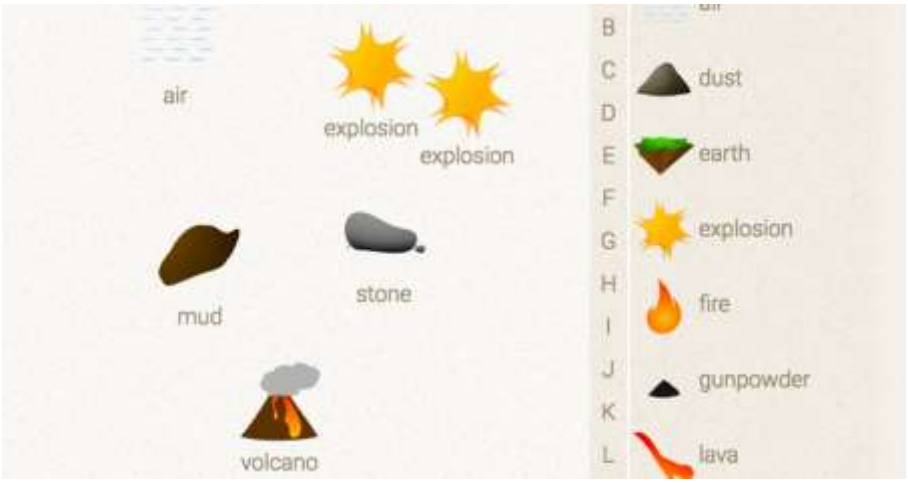

Fig. 3. Crazy Game, Source: crazygames.com

Digital technology can also be optimally used in cases where, on the one hand, a relatively long process has to be monitored and continuously evaluated, and on the other hand, where the inclusion of a measuring device is recommended, followed by data processing, evaluation and, in some cases, representation. A great example of this is the content of the topic of the first appendix with a weather study, and the content of the topic of the third appendix related to plant development. Mention may also be made here of the processing for examining the transparency of the water in the seventh topic.

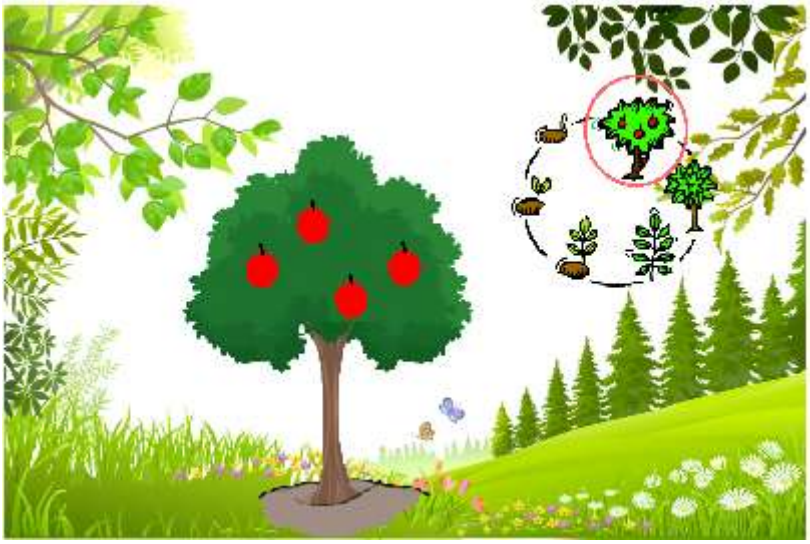

Fig. 4. Plant development project, Source: Mikrobisuli accredited talent development workshop, own image

3.4. Methodological particularities of digital culture education, analysis of the applied methods

Featured task of the course is to develop the ability to acquire and apply knowledge independently. A combination of methods should be used in education that is suitable for developing self-learning and application skills, practical work skills. These skills create the conditions for later self-education and help students to acquire the knowledge they need to solve problems arising in their lives. (Gál, 2011)

When choosing the applied methods, the content of the teaching, the didactic task to be solved, as well as the characteristics of the students (age, abilities, existing knowledge) must be taken into account.

The topics in the appendices are also included in the curricula of the previously mentioned subjects and offer a great opportunity to deepen environmental education in connection with the subject of digital culture. The methods for acquiring the tasks in the annexes are only a recommendation, as each institution, like each group of learners, is different, so the levels and tools available may be different. Any available digital aid or target software can be used to complete the tasks. It is primarily recommended to use the Scratch development environment to complete programming tasks.

Each topic contains a so-called “A. Task”. These are typically aimed at creating a digital drawing or presentation, which, in addition to helping to systematize, understand, and interpret each process, is not only easy to implement — meaning it can be issued to any age group from

grade 3 onwards — but it can also be characterized by a high degree of creativity and can be linked to any topic in any curriculum.

„B. Task" refers to an activity that is used to track a longer process through a digital work. Its huge advantage is that it shows the phases of an activity spanning a larger time interval in overall. It is especially useful for students who do not have the patience to wait for the process to happen in a natural way, or can more easily interpret and process the data with the help of a spectacularly displayed result.

Another type of task is code generation, where we solve certain tasks using program code or an application.

The advantage of the method is that it allows space for imagination and creativity, in addition to developing many skills, abilities and competencies - here we can think of information and communication technology, or even mathematical, logical abilities, and such personality traits as independence and accuracy. All of these may be accompanied by other "*additional tasks*" that serve a deeper understanding and further development.

In some parts, students may also encounter robot programming as part of the experiential teaching method. The application of robotics has many advantages, as it not only serves the application of algorithmic thinking, but also creates a connection between the individual subjects. In addition, it develops many competencies and personality traits through cooperative activity, think only of STEM skills, communication and cooperation skills, personality traits of spatial vision, perseverance, purposefulness, helpfulness, but of course we could list them for a long time.

The advantages of the methods have already been discussed, now let us mention the possible disadvantages. No matter how advanced the technology is, it will never be able to replace reality! It is not possible to process topics related to environmental education only with digital methods, since - especially in the field of natural and environmental education - the goal is primarily to receive and experience the senses in nature and the environment. Digital technology can only communicate audio-visual knowledge, which is even snatched from its original environment.

No matter how playful and simple is the chosen task, we will not necessarily achieve a goal with a humanities-minded student. It is necessary to recognize that not everyone is receptive to digital culture, in which case you have to think through the possibilities and the expected consequences.

As we have seen, the inclusion of the subject of digital culture in the field of environmental education can at best be only in the form of an additional feature or teaching session. Its effectiveness thus depends to a large extent on the teaching of other subjects related to environmental education, where it is particularly important when and at what level the given topic is taught to children. Digital culture is best able to perform its task in relation to environmental education if the given topic is taught at the same time and, of course, in the appropriate depth, in consultation with the teachers of the other subjects.

3.5. Development of digital and other competencies

Acquiring algorithmic thinking using IT tools is best suited for developing STEM skills. In the process, not only the children's information and communication technology skills develop, but also the mathematical and natural science skills, in addition to that the tasks related to coding and robotics further strengthen the acquisition of the given way of thinking and the development of the engineering approach. As a positive return, creative methods can relieve children's initial anxiety about science subjects.

It is extremely important that not only STEM skills but also closely related competencies and personality traits are developed during the sessions.

During the solution of project tasks, logical thinking and problem-solving skills develop. Interoperability between subjects is achieved, as children have an excellent understanding of processes and in many cases the solution requires the evocation and complex application of additional knowledge related to mathematics, science and other subjects, for example, we can think of some tasks related to robots. As a result, their performance in related subjects may also improve.

In addition to digital competencies, the following areas are improved in the digital processing of topics supporting environmental education:

- critical thinking and problem solving
- creativity
- logical thinking
- organizing ability
- overviewing ability
- trying new ideas, solutions
- numerical thinking

- problem exploration analysis
- planning
- checking ability
- communication skills
- cooperation skills

In effective education, the learning process goes hand in hand with personality development, so the following personality traits can also be developed excellently during the selected tasks:

- curiosity
- adaptability
- accuracy
- independence
- responsibility
- helpfulness
- empathy, tolerance
- perseverance failure tolerance
- motivation capability
- spatial vision
- purposefulness

3.6. Differentiation and talent management

There is a vast difference between the most talented students in an elite school and a school of students with special educational needs. Moreover, there may be significant differences between two parallel classes of an arbitrarily chosen school. At the same time, due to the heterogeneous composition of classes and groups, there are also students in each community who are able to perform better than the local average, or who are lagging behind their peers. Dealing with differences usually requires a differentiated approach which can be realized by giving different tasks to talented, average and less able students, or by having different accounts or reports for the same task. Motivation is a prerequisite for effective learning in all cases. “Personalized” or group-based tasks that require creativity help maintain interest. Monotonous, sometimes over-thought-out tasks often lead to a loss of motivation. To this day, the extent to which talent depends on the child's innate abilities and the role of the environment and upbringing are not precisely defined. However, it is a fact that the most important elements of

talent - skills, creativity, commitment to the task - can be developed. From the point of view of commitment to the task, motivation, it is important to make a well-thought-out choice of practice tasks. (Gál, 2011)

Digital exercises are typically of a reproductive nature, where a pre-prepared, possibly collected document or presentation has to be made repeatedly for the student.

Each element of the document or presentation, its appearance and position are determined by the detailed instructions of the task description. For students with lower abilities, meticulous formulation of tasks can provide security. With some practice, they get experiences of success, they can achieve good results. Therefore, in the case of weaker students, it is advisable to supplement the presented exercises with comprehensive instructions that cover all aspects.

For more talented students, these tasks, in addition to not developing creativity, greatly destroy motivation. For them, it may be sufficient to formulate the task in a single sentence. However, assignments that do not provide a detailed description and allow students to be creative can only be published in this form if students are already aware of the basic rules for making a presentation, gathering and organizing information, and know the expectations of the specialist teacher. (Gál, 2011)

In the case of intermediate students, of course, it is necessary to move between the two endpoints of the scale set up in this way, sometimes assessing what is the minimum set of instructions that is absolutely necessary to solve the task.

4. Summary

As long as the future could have been roughly estimated from the present, and there was little difference in the lifestyle, the transfer of knowledge wrapped in the curriculum was suitable for everything. Today, however, the world is changing at an almost untraceable pace. Emotions and attitudes towards our environment change faster than generations follow each other. It is inevitable to understand the factors and processes that affect the state of our environment, to find the connections between adverse changes and the human activities that create them. We need to find an answer as soon as possible on how to prevent environmental disasters, how to live in a way that has the least, but still acceptable, environmental impact, and our decisions at what cost - effecting the environment as well - can sustain our economy. Environmental

problems can exclusively be solved if we respond in a timely and meaningful manner, and if we grow up and educate with the purpose and importance of environmental education in mind.

In this article, presenting the purpose and importance of environmental education, I dealt with sustainability education and the roles related to it and I extended my inquiry to the legal regulation and institutional implementation of environmental education.

The section on the practical application of the subject of digital culture, which is especially suitable for supporting environmental education, in addition to the effects of digitization and STEM skills also discusses which topics are suitable to be processed in digital form. The methodological peculiarities of teaching the subject of digital culture are discussed below, and the methods used for the support are also analysed, together with the presentation of the advantages and disadvantages. The topic of developing digital and other competencies, as well as differentiation and talent management were also included in the article. The annexes contain a series of good practices with detailed task descriptions and solution guidelines. Of course, the range of topics can be expanded at will. The processing recommendations given in the study show a possible approach to the problem, and a number of additional or different tasks can be presented for the mentioned topics.

Appendices

Appendix 1

Topic: Observation of the elements of the weather

Task B: prepare a calendar of weather supported by digital tools.

Guide:

1. Edit the elements of the weather: wind, sun, cloud, precipitation. Each element has several forms of appearance.

2. Create a template where you can insert an item specific to that day.

Additional tasks:

- We record not only one element by day, but more, sectioning it to two or three parts.

- Measure several properties a day - temperature, precipitation, humidity - which are recorded in the template.

- Prepare diagrams based on the recorded data.

Appendix 2

Topic: The water cycle, its manifestations in nature

Task A: Prepare presentation or digital drawing about the topics listed below:

- Waters of the settlement and its surroundings.

- Types and appearance of stagnant and flowing waters.

- Investigation of different types of precipitation.

Coding: Use the GCompris application or create a program that illustrates the water cycle

Guide:

1. Create the characters: sea, sun, cloud, river, water tower, water treatment plant house.

2. Program the process: The sun makes the seawater start to evaporate. The vapour forms clouds. Rain starts to fall from the cloud. The level of the rivers is rising. River water is transported by pumps to a water tower and from there to a water treatment station. The purified water gets into the houses also through pumps.

Appendix 3

Topic: Observation of plants in the immediate environment

Task A: Prepare presentation or digital drawing about the topics listed below:

- Basic knowledge of plant care.
- Observation of cultivated plants.
- The role of our vegetal foods, vegetables and fruits in a healthy diet.
- Investigation of environmental conditions essential for plant life.
- The impact of environmental changes on plant life.

Task B: Creating a plant care calendar with the support of digital devices.

Guide:

1. Sprout and then plant a bean.
2. Monitor the development of the plant, record the data at regular intervals, take photos, videos, sound recordings as desired.
3. Create a calendar or presentation from the available files.

Additional task: Make a diagram from the recorded data.

Coding: Create a program that demonstrates the development of a plant

Guide:

1. Create the characters: drawings of the plant at each stage of development or different stages of growth of a plant growing on soil or in pot.
2. Place each developmental stage in a circle on one edge of the screen. The developing plant is in the centre of the screen.
3. Indicate the stage of development we are at and then develop the plant accordingly. Make the sections follow each other every two seconds.

Appendix 4

Topic: Observation of fauna in the immediate vicinity.

Task A: Prepare presentation or digital drawing about the topics listed below:

- The difference between the lives of wild, farmed and pet animals.

- The diversity of wildlife, interesting animals
- Comparison of animals based on a chosen criterion.
- Protected plants and animals
- Presentation of the typical bird species of the landscape in a few sentences with pictures and accompanying bird sounds.
- Keeping and caring for a pet

Coding: Create a program that introduces farm animals

Guide:

1. Draw the characters: horse, cow, hen, pig, sheep, goat
2. Place the characters, then at a click on any of the characters, display a few sentences about it, a picture, and the voice of the animal in a new program window.

Coding: Create a program in which a puppy can be cared for

Guide:

1. Draw the characters: dog with multiple costumes, feeding bowl, sleeping basket, leash, ball
2. Place the dog in the centre of the screen, while the characters needed for care in the four corners of the screen.
3. By clicking on a chosen character, the dog should go to that location and perform the selected action.

Additional task: Clicking on the ball should lead to a choice from several games. Optionally take the dog through an obstacle course or get out of a maze.

Robotics task:

Robopet: build a robot kitten or robot dog and get it to move, if possible make a sound as well.

Appendix 5

Topic: Properties and relationships of substances in the environment

Task A: Make a presentation about the process of the formation of a selected substance

Coding: Use Little Alchemy application or create materials with program code!

Guide:

1. Create the four primordial elements as characters

2. Make the program to create a new material by dragging two chosen characters on top of each other in case of a right combination

Additional task: The created new materials could also be used to create other new materials. To simplify the program, we recommend that a maximum of ten materials could be created.

Robotics tasks:

Search for the sun: the task of the robot is to determine the direction from which the highest light intensity can be measured, and then to turn any device in that direction.

Windmill: operate a windmill with the help of a robot!

Measure humidity: use a digital tool to determine the humidity of the soil.

Appendix 6

Topic: The main features of our life.

Task A: Prepare presentation or digital drawing about the topics listed below:

- Creating the right agenda: learning, outing, moving, resting, eating time.
- Proper behaviour in nature.
- * The most common harmful effects of the environment on our body.

Appendix 7

Topic: The cleanliness and pollution of our environment.

Task A: Prepare presentation or digital drawing about the topics listed below:

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- Sources of pollution in the environment, the impact of pollution on humans and creatures.
- Possibilities of prevention, defence.
- Process of cleaning water, soil and air

Robotics task:

Water testing: examine the transparency of the water using a digital device.

Appendix 8

Topic: Our household appliances, recyclable materials, waste collection.

Task A: Prepare presentation or digital drawing about the topics listed below:

- Getting to know different energy consuming devices, comparing their energy consumption.
- Environmentally friendly consumption habits, waste management, water saving.
- What are the recyclable materials, what can be made of them
- How a modern waste processing plant works
- Waste collection

Coding: Create a program in which selective waste collection can be implemented.

Guide:

1. Create the characters: at least four different types of garbage and four bins

2. Solve it with a program to get a warning message in case you try to put the selected trash in the wrong bin!

Robotics task:

Cleaning robot: build a robot capable of pushing aside or grabbing smaller objects. Get the robot to either push the garbage in its path aside, or collect it to a designated place.

Waste separation: build a robot that can distinguish between scrap metal, paper or PET bottle.

Appendix 9

Topic: Traffic

Task A: Prepare presentation or digital drawing about the topics listed below:

- Cycling, getting to know signs, lights, road signs
- Modern means of transport and their pollution
- Environmentally friendly modes of transport, energy saving vehicles.
- The electric car

Coding: Create a quiz program with traffic signs topic

Guide:

1. Create the characters: look for pictures of traffic signs and create characters from them adding three possible answers with the letters "a", "b" and "c".

2. The program will display the characters one after the other and ask for the letter of the correct answer. Do not proceed to the next traffic sign until the user has found the appropriate definition for that traffic sign.

Appendix 10

Topic: Our habitat and our objects

Task A: Prepare presentation or digital drawing about the topics listed below:

- Presentation of the advantages and disadvantages of urban life
- Presentation of village life
- Crafts and their products. The process of making a product.

Appendix 11

Topic: Data collection

Task A: collect digital content links for the topics below:

- Nature films
- Plant and animal identifying online applications
- Games related to nature and environment
- Interactive tasks related to nature and environment

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