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USE OF WASTE, PROCESSING THE THEME OF CIRCULAR ECONOMY IN SCHOOL WITH THE HELP OF RECYCLING CLOTHES

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Abstract

The pedagogy of environmental education and sustainability has long been an important part of children's education both worldwide and in Hungary. We have been aware of our planet's problems for decades, and finding solutions to them is an increasingly pressing issue. The pedagogy of environmental education and sustainability aims to target these questions during the education of children. In Hungary, these goals are mostly to be achieved with the help of natural science subjects and with the sustainability subject, which can be chosen as an independent matriculation subject from September 2022. The subject of sustainability is still taught in a few institutions. However, the issue of sustainability and the lessons associated with it have been supported by the program called Sustainability Theme Week since 2016. A lesson plan by Dominik Máté Fabula that was created during a public tender they announced is also the basis of the present work, which is about the reuse and recycling of clothes based on a circular economy. The students, learning the difference between the linear and circular economy, must work out the possibilities of recycling clothes in group work. In our study, we will present the possibility of implementing the lesson plan, possible practical changes, and experiences after implementation.

Keywords: sustainability, circular economy, project work, recycling, education

INTRODUCTION

The rapid development of modernisation and the problems it has created, including energy shortages, have raised a lot of issues that the world has had to address, and the UN Climate Change Conference in 2015 set significant targets in the fight for sustainability (Szélpál and Varga 2023). The need to do so was to eliminate the problems that threaten the coexistence of man and nature and even man's existence. In order to build a sustainable future, we must focus on the needs of future generations, one of which is to minimise waste emissions and to recycle waste and by-products professionally. In a lot of cases, it is also necessary to refine these methods, as improving them will also help to advance sustainable development (Simonyi and Zsótér 2020).

The targets set by the UN also affect our country. Quality education is one of these goals. (Maketi et al. 2023) In Hungary, NGOs, including the Green Ambassador Association, have also become involved in the approach to sustainable development and environmental awareness. Several of these NGO-supported programmes include the Sustainability Week programme, organised by the Non-profit Alapértékek Zrt. with the help of supporting organisations since 2016. The Sustainability Week also includes a call for applications for teachers, one of which is the basis for our work. In our work, we wanted to work on the topic of the circular economy with 9th grade students of the technical school, using a method based on recycling clothes. We worked with the available students within the framework of the complex natural science subject, but the topic was part of the sustainability subject. Sustainability as a subject has been an optional subject for schools since 2020 and students have the opportunity to take the school-leaving examination from it (NAT 2020).

Our work examined the practical application of a lesson plan submitted for a tender, based on the following criteria:

1. Can the lesson plan be used with technical students?
2. How does the compulsory complex science course for technician students support their career development?
3. To what extent are the theoretical aspects of the lesson plan applicable in practice? And based on experience, what changes are needed to make the lesson plan applicable?

Our work was complemented by a review of the literature we considered relevant. In addition, we reviewed the training documents of the two classes we taught. Finally, we carried out a trial of the lesson plan to explore the practical potential of the design.

Environmental education

The issue of environmental education is becoming increasingly important around the world, as economic, social, and environmental challenges are increasingly felt

in everyday life, in global and regional areas. An important part of environmental education is to ensure that the views and attitudes of educators prepare future generations for these increasingly frequent changes (Dudok 2022).

The foundations of environmental education as we understand it today were laid at the beginning of the 20th century. In some Western European countries, teaching about nature and education for nature conservation was an important aspect of education at that time. This was achieved through outdoor education such as school nurseries and green classes. In these lessons, nature conservation was seen as a moral duty for children. Under the 2003 amendment to the Public Education Act, all institutions are obliged to draw up their own environmental education programmes. This was supported by the increasing attention given to environmental problems in the media and other forums in the last third of the 20th century. Several foreign and domestic works on the subject, such as Carson's Silent Spring (1962) and Pál Juhász Nagy's Vanishing Diversity (1993), have highlighted the threat to society's environment, which is in danger, and which should be given attention. These sources are still regarded as fundamental works for those concerned with environmental education. The concept of environmental education is not a specific concept, but a combination of several factors. The eternal question is: what do we mean by environment? Why do we talk about environmental education and not education? The latter is easier to answer, since it is not only a matter of transferring knowledge, which is the task of education, but also of shaping the pupils' attitudes, personalities, and environmental attitudes. A good basis for understanding environmental education today is the education about the environment, education in the environment, and education for the environment (in Hungarian "környezetről, környezetben, környezetért" or shortly 3K, denoting the first letter of each word) relationship (Fig. 1) (Schróth et al. 2015).

Learning about environmental problems changes the way we approach the space around us (Armstrong and Impara 1991). The integration of disciplines highlights systems thinking, helps us to take a holistic approach, and to see problems in a more complex way and to find simple but effective practical solutions. It also aims to promote sustainability in the service of future generations.

Pedagogy of sustainability

At its 57th session in December 2002, the United Nations declared that "education is an indispensable element in achieving sustainable development". By the beginning of the 21st century, it was clear that the environment itself, the economy, and society existing in harmony would provide sustainability (Fig. 2).

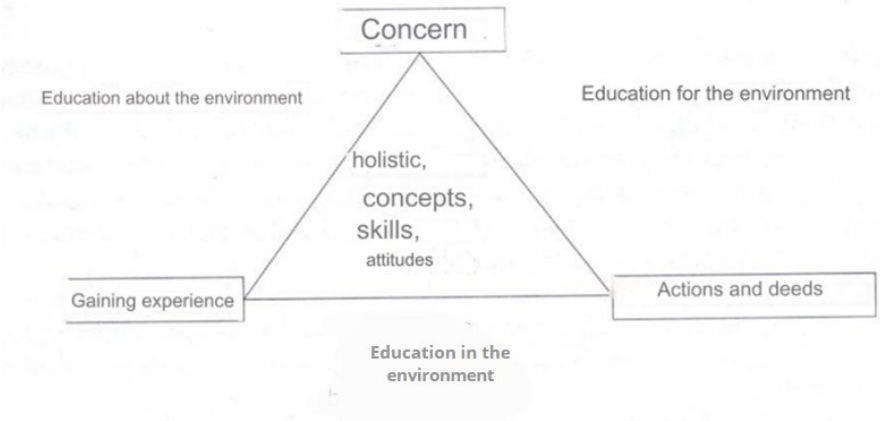

Fig.1 Concept of environmental education (after Palmer and Niel, 1994) (Schróth et al. 2015)

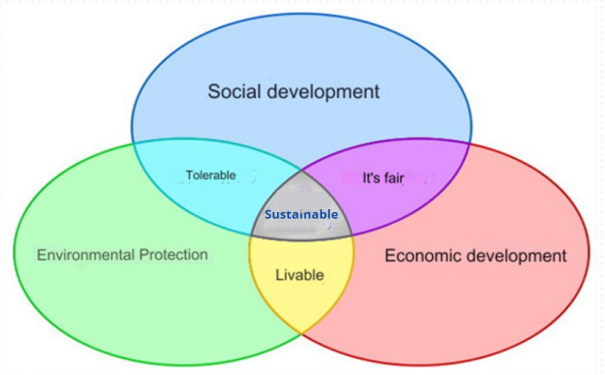

Fig.2 Environment, society, and economy (Schróth et al. 2015)

In the early 2000s, there was not really any literature mentioning education for sustainability, even in the NC, environmental education was the accepted terminology. Also in the early 2000s, learning and teaching for sustainable development emerged, with the important elements of looking for connections, pointing them out and laying the foundations for peaceful coexistence with nature ethically, politically, and economically. In later years, this was replaced by a pedagogy of sustainability. The pedagogy of sustainability is composed by three main components: scientific knowledge, value system and social practices (in Hungarian "tudományos ismeretek, értékrendszer és társadalmi gyakorlatok" or shortly TÉT, denoting the first letter of each word) (Schróth et al. 2015).

The criteria of the pedagogy of sustainability, which presuppose a renewal of the teaching and learning process, are formulated in a similar way as the expectations of environmental education.

Criterias of the pedagogy of sustainability:

- Developing systems thinking
- Developing and shaping a holistic approach
- Developing the capacity for lifelong learning
- Exploring global and local dimensions
- Developing relevance and future-oriented thinking
- Providing activity-based education
- Developing problem-solving and collaboration.

The same aspects of the two educational methods show that they are mutually supportive in education (Kováts-Németh, 2010; Bodáné, 2015).

The development of systems thinking skills and competences are aspects of lifelong learning that are much more advanced than performance-oriented examinations, and should be more needed (Réti and Varga 2008). Students who are educated in this style of education should be able to think creatively, be sensitive and take action. The pedagogy of sustainability is often defined as a pedagogy of change, and achieving this is an important goal. Sustainable development tries to focus as much as possible on all changes, for instance, the behaviour of learners, learners' perception of the world, the work of teachers, or the ways schools operate. Teachers are faced with new challenges and new demands when applying this pedagogical approach, as it requires awareness and a different focus on values than the traditional teaching-learning process, and teachers need to be open to students and support self-reflection. Some of the challenges experienced by teachers can also lead to real issues:

- Organising activities that depend on students' attitudes;
- A paradigm shift in teacher roles, i.e. the practical application of learner
- Activity-centred motivational tools and the promotion of self-reflection;
- Addressing generational disadvantages in a flexible and constructive way.

Teachers' confrontation with these problems and their self-development in the process, is part of the pedagogy of sustainability and a moment of teacher development. (Lubinszki 2023).

Project pedagogy

We often find that, although we sense the possibility of solving a given problem, we are not able to carry out these processes because we do not have the practical knowledge to do so. The process of putting algorithms into practice is often a problem for adults, and in childhood it is even more demanding to learn algorithms properly (Makádi 2015).

It is important that students receive practical training alongside theoretical knowledge. The example of alternative schools (such as Waldorf schools today) shows that these institutions give students the opportunity to choose from as many learning methods as possible. Practice-oriented lessons have an important role to play in providing the external, often visual, motivation that triggers students' motivation to learn (Dobos 2018).

Project pedagogy is a method that belongs to the category of activity-based practices. It is a method found in reform pedagogical trends and is based on children's agency. The pedagogy of project pedagogy is defined by several areas, which are illustrated in Figure 3.

The important role of the method is to develop creativity and critical thinking, thus creating communication, which is very useful for children to develop cooperation and joint work. Project pedagogy, in contrast to the traditional frontal form of work, relies on the role of the teacher slightly secondarily, only as a support person, assisting in the products invented, prepared and implemented by the students on the topic raised. Looking at the framework of the project method, we can see that it is related to the hierarchical elements of Bloom's taxonomy (Fig. 4). The guiding elements of project-based learning include:

1. a problem-centered
2. reform pedagogical elements
3. innovative ways of organization
4. game-like solutions (gamification)
5. individual and group work alike

In the project method, the individual interest of students is of paramount importance for motivation and personal connection. Experience, interest, and activities are emphasised as the main sources of learning. In contrast to traditional methods, we adapt the curriculum to the children, who are able to shape it through their work, and thus take an active part in shaping the project and determining the steps for its implementation. In this way, the method promotes personal contribution, which also develops employee competences and maintains natural interest. An important step in project pedagogy is the setting of common objectives, which are set at group level but can be achieved by integrating individual orientations.

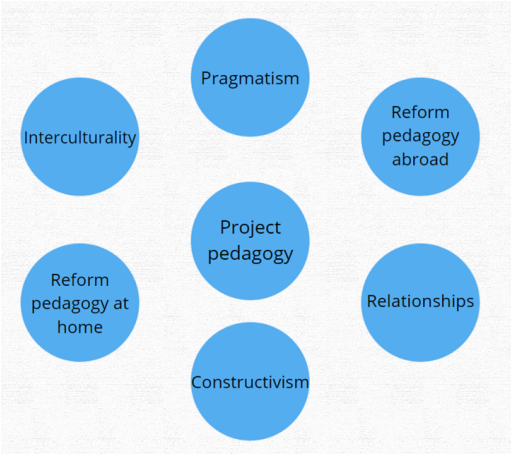

Fig.3 The pedagogy of project-based learning (Schnell et al. 2022)

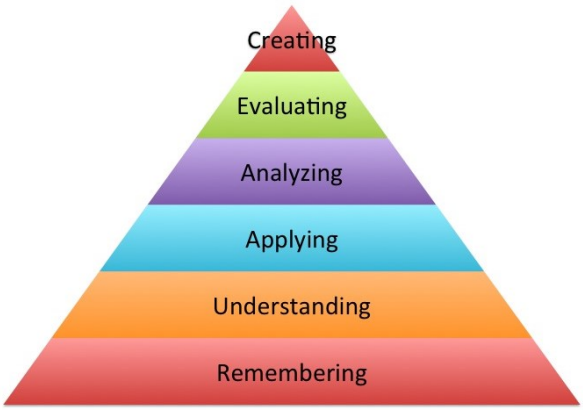

Fig.4 Bloom's taxonomy (Source: [1])

The importance of the objective is maintained, and the individual connection to the task is not lost, while students play an active role in the birth of the project (Schnell et al., 2022).

Both environmental education and the pedagogy of sustainability are almost identical educational trends in the studies we have studied. Both systems seek to develop a complex vision, promoting continuous learning to adapt to the constant changes in life. In all cases, complexity is promoted by the two approaches, which seek to make students aware that disciplines, society and different processes cannot be achieved without each other. The two forms of education do not only aim to solve current problems, but also to find solutions to long-term and large-scale problems. To this end, both forms of education promote practical education in schools. Their activity orientation is strongly supported by project-based learning, as today's students are more visual learners and have a high level of creativity.

METHODS

Analysis of documents

Our work is based on the draft lesson plan submitted for the Sustainability Week competition ([2]). Here we could develop a lesson plan or project plan based on different themes and submit it for a call for proposals. For the present work, we looked at the Sustainability Week website to see what information was available on the objectives of the programme itself.

Our work was carried out in the Kecskeméti SZC Virágh Gedeon Technikum (Fig. 5), where we tested the planned lesson in two classes. For the teaching of both classes, the institution uses the Programme Curriculum (in Hungarian.: Program Tanterv, henceforth PTT) and the Training and Output Requirements (in Hungarian.: Képzési és kimeneti követelmények, henceforth KKK) of the two branches. The timetables of the classes are based on these, so we reviewed the requirements of the PPT and KKK of the two branches in the documents of Information Technology and Telecommunications; Information Systems and Application Operations Technician and of Law Enforcement and Public Service; Public Service Technician.

We then looked at the topics set out in the Sustainability Framework Curriculum, which we had already reviewed once for the Sustainability Week application. We studied how the topics of the subject intend to develop the areas of competence defined in the NC. As a preliminary step, we also looked at the areas of competence in the NC and compared them with the areas of competence formulated in 2012 (NAT 2012).

Preliminary knowledge assessment on the topic

Both classes were asked a few simple questions related to the topic, to which they had to either answer yes/no or choose from a multiple choice test, in order to assess which concepts and processes they would need to reinforce when working on the topic.
The questions asked were:

1. Have you heard of circular economy? (Yes/No)
2. What do you think circular economy is?
    a. A method based on recycling;
    b. An agricultural method;
    c. A method based on the exchange of products between villages.

After answering these questions, we examined the extent to which students could relate the concept to its meaning.

Fig.5 Figure 5 Kecskeméti SZC Virágh Gedeon Technikum (Source: [3])

Testing the draft timetable basis

We wanted to test the lesson plan submitted to the Sustainability Week competition in a practical application (Table 1, Fig. 6, Fig. 7). We were curious to see how much time a particular lesson could take, as in practice, this could be different for each class, and in this case, we were able to look at it for two classes. In addition, we wanted to observe how students could work in groups in a cooperative activity where they had to create a product together. This product was given some criteria to work on, but beyond that, it was entirely up to the children's creativity to decide on the process of creating the product and its content.

Tested basic lesson plan:

Sustainability theme
Topic: Circular and linear economy
Concepts: Linear economy; Circular economy; Recycling; Reuse
Activity: Cooperative group work; Poster/Table design

Table 1 Time frames of the basic lesson plan

0	CONTENT	CLASS ORGANISATION MODE	METHOD	INSTRUMENT
1.	*Prior knowledge assessment* Answering oral questions using answer sheets.	Individual work	Questionnaire (questionnaire slip)	Reply slip
2.	*New knowledge acquisition* Watch the video tutorial, discuss the content of the video and gather the main points.	Frontal work	Film analysis	Instructional video
3.	*Capturing new knowledge* After discussing the content of the video, compare the linear economy and the circular economy using diagrams.	Frontal work	Film analysis Figure analysis Asking for discussion	Smartboard Computer Powerpoint slides
4.	*Setting a task* To devise a method or programme for recycling or reusing clothes in a circular economy, for which a promotional poster and a description should be created.	Frontal work	Teacher's statement	-
5.	*Performing a group exercise*	Teamwork	Getting a job Cooperative group work	Phone Computer
6.	*Presentation of products* Each group presents its poster and explains what programme or method it represents.	Frontal work	Presentation	Computer Products

Task description: design a programme or method to demonstrate the recycling or reuse of clothes based on the circular economy. Create a tableau or a poster to promote the method or programme you have invented. Make a short description of your work, showing what the poster you have created is about.

Figures and illustrations used:

Fig.6 Linear economy

Fig.7 Circular economy
(Source: European Parliament, VG-graphics)

Knowledge assessment after completion of the topic

After completing the project, we conducted a follow-up knowledge assessment with a written question on the two most important concepts of the topic, and then asked the students about the importance of sustainability with a verbal question. Here we wondered what they thought about the importance of sustainability today.

RESULTS

Analysis of documents

Sustainability Week

Sustainability Week provided the basis for our work, so we first looked at the website they use and analysed what the programme is about and what opportunities it offers (Fig. 8).

The problems of our planet, which affect all of us, such as global warming, water scarcity and dwindling energy supplies, are all issues that scientists, environmentalists and NGOs have been trying to raise awareness for, for decades. It is not only global leaders who should be expected to solve these problems, we ordinary people ourselves can also do a lot to help solving environmental issues. It is necessary to start developing this mindset from an early age, as they are the most receptive to the issue. It is essential for them to learn about the importance of the issue and to recognise their relevance and involvement in order to be able to do a lot to protect our planet ([2]).

"Sustainability education is a lifelong learning and socialisation process that develops informed and active citizens with creative, problem-solving mindsets, who are aware of the natural and environmental, social, legal and economic context and who are ethically responsible for their individual and collective choices and actions. These actions will ensure a healthy environment and an efficient economy for the future." - Katalin Czippán - Péter Havas - András Victor ([2]).

The Sustainability Week website offers teachers and students several opportunities to support interactive lessons. Each year, a call for applications is launched for teachers to create teaching packages on specific topics. These kits are lesson plans and sample projects, which are then uploaded to the website and made available to other teachers. The topics announced in 2024 were:

1. Air and its living environment;
2. Recreation;
3. Air and biosphere; Life and wildlife; Food and wildlife; Circular economy;
4. Waste and conscious consumption.

These educational packages all aim to transfer knowledge through active methods that are engaging for children of the 21st century and make learning exciting. An important element of each of these packages is that they are built around issues of sustainability and the environment, and the topics shape children's responsibility and informed decision-making. These lesson plans and sample projects include not only outlines of lessons and projects, but also all the diagrams, worksheets, digital materials and apps needed to complete the tasks and make the lesson interactive. In addition, complete teaching packages for teachers are available on the website, where, in addition to these lesson plans and sample projects, online lessons, competitions, contests and activities are also available. One of the applications available in the programme is the Green Compass mobile app - Green Finance for Secondary School Students, which has been developed primarily for secondary school students. This app gives children money-saving and environmentally friendly ideas for their everyday lives, while teaching them important financial basics. National and international programmes, competitions and contests are also available to help deepen the understanding of these topics. One of these is the Most Active School Award competition, where schools from home and abroad can apply with their activities during the Week ([2]).

If dedicated professionals would like to share their experience and knowledge, and support the Week's message, the organisers will provide opportunities for professionals to volunteer to visit schools. In addition, Thematic Week promoters will host teachers visiting with students at various external venues to support the Thematic Week message. Registration for these events is required and the list of events is constantly updated on the website. In addition to the programmes, in-service training is available for teachers, both at home and abroad, and online as well ([2]).

The Week organisers are also conducting a survey to gather students' and teachers' views on their experiences of Sustainability Week.

Analysis of KKK and PTT documents for the sectors

The time frames used for this work were the lessons of the complex science subject in the school's 9.A and 9.B classes.

The KKK document describes that during 5 years of technical education, students will receive a minimum of 2,100 hours of classroom instruction (not including the content of general studies), two years of preparation for the vocational examination only, also with a minimum of 2011 hours of classroom instruction. In addition, the duration of the continuous apprenticeship for students in technical education is documented as 70 hours and the duration of the preparation for the professional examination only is also 70 hours.

Fig.8 Sustainability Week logo (Source: [2])

A law enforcement technician's training covers the basics of law enforcement, private security and law enforcement. They will be involved in guarding, surveillance, monitoring and, if necessary, taking action, even in a foreign language. Their professional skills enable them to perform various tasks such as guarding facilities, patrolling, escorting cargo or apprehending criminals. They have profound communication and psychological skills and respect the law and personal rights. In the performance of their duties, he or she uses appropriate means to ensure safety and environmental protection and takes responsibility for decisions which are both physically and mentally challenging.

In addition to the lessons that support the acquisition of professional knowledge, the general knowledge subjects (including the complex science subject) will provide a law enforcement technician with adequate and complex professional preparation. The job description states that a law enforcement technician must also be able to act in the interests of environmental protection and must also keep environmental protection in mind in their work. This can be best supported by a complex science subject, and nowadays sustainability is one of the most important promoters of environmental protection, so that we can say that the subject of our work is an important one, which fits perfectly into the educational picture and the professional development of the students.

Looking at the PTT document for the sector, there are fewer threats related to this topic. The document deals with the description of professional subjects such as professional foreign language, communication, and legal background. However, there are also several references to the need for professionals to take care of their environment and their own health (PTT). Here, we can also draw some parallels with the fact that if a professional in this field wants to maintain their own physical and mental health, it is also important to have a knowledge of complex science subjects and to pay attention to the long-term health and well-being of oneself and one's environment, based on a sustainable lifestyle. So, taking a little further into what is written in the document, we realised that our topic is also related to these and helps to some extent the professional development of students.

We then reviewed what the sectoral documents for the 9.B Computer Science and Telecommunications; Information Systems and Applications Technician class wrote. Looking at the number of sessions of vocational education described in this document, we can see a correspondence with the previous Law Enforcement Technician JCC document, as in this document, too. In addition to the content of general knowledge subjects, students participate in 2,100 hours of sessions during the five years of technician education, and in two years of preparation for the vocational examination only, they also spend at least 2,100 hours.

After reading the job description, which states that an IT systems and application operations technician is involved in the design, installation and operation of small and medium-sized networks, working with system administrators and software developers and independently handles simple problems using web search and internet knowledge bases. They are responsible for the coordinated operation and upgrading of IT network devices, servers, workstations and applications used in enterprises and cloud services. Moreover, they assist colleagues in the use of applications, perform application management tasks, and installs and configures IT security tools, firewalls, anti-virus software and operates virtual server environment. In addition, these technicians are expected to solve application and web tasks, operating web server systems, manages databases and communicating effectively in both Hungarian and English on technical topics. (FAQ) Immediately related to what is read in the PTT document, the document, in addition to pointing out the professional, computing skills and attitudes, highlights in several places that an IT systems and application operations technician is expected to communicate in Hungarian and in the professional foreign language and to work collaboratively with other technicians (PTT). Based on these facts, we can also say that our topic on sustainability in the complex science class is closely related to the professional development of an IT professional, because as we have already mentioned above, sustainability is not only about nature, but also about the symbiosis of nature, economy and society and in this case we can conclude that a professional in this sector is the one who best synthesizes the economic and social parts of sustainability.

Reading through the documents, the content of the KKK and PTT documents for both sectors confirms that it is worthwhile to include lessons on sustainability in the complex science subject of their general education courses, in addition to their professional subjects, as the professionals trained in both sectors will in the future cultivate the foundations of sustainability that will help to improve everyday life, whether in the short or long term.

Areas of competence set out in the NC

Similarly to the 2012 NC, the 2020 document sets out the key competences that children should acquire. Comparing the two lists, it is clear that there are no differences between the domains specified in the two documents, but in 2020 some previously separate areas of competence have been merged (communication competences, mathematical thinking competences). It is important to note that in the 2020 document, the science competences did not appear as a separate domain, but were merged into the maths and thinking competences. The areas of competence set out in the 2020 NC describe the development objectives in Table 2.

Sustainability subject curriculum

Sustainable development is about using resources wisely to ensure that future generations have a decent living environment. This new framework curriculum has a strong focus on sustainability, emphasising that all human activities are determined by the Earth's carrying capacity. Nature, society and the economy are interdependent systems, so problems must be addressed in their interconnectedness and sustainable solutions sought. The subject of sustainability, which is an optional subject in secondary schools every school year, helps to prepare for sustainable development. Sustainability is a priority area of the core curriculum, which emphasises the need to use

Table 2 Comparison of National Curriculum (NC) in 2012 and in 2020 (NAT 2012, NAT 2020)

NC in 2012	NC in 2020
Effective, independent study	Study competencies
Native language communication	Communication competencies (native and foreign language)
Foreign language communication	
Mathematical competence	Mathematical and logical competencies
Scientific and technical competence	
Digital competence	Digital competence
Social and civic competence	Personal and social competencies
Initiative and entrepreneurial competence	Employee, innovation and entrepreneurial competencies
Aesthetic-artistic awareness and expressiveness	Competencies of creativity, creative creation, self-expression and cultural awareness

resources sparingly and responsibly. Throughout the curriculum, it builds on students' experiences and knowledge and provides opportunities to develop critical thinking and inquiry. The flexible curriculum provides adaptability to the learners' environment and interests.

The role of the subject in year 9 or 10 is not only to transfer lexical knowledge, but also to develop environmental awareness and individual responsibility. Students need to understand the links between sustainable development and their own choices, so that they know how to act in their daily lives. The aim is that the values of sustainability become part of their identity. The framework curriculum document includes the sub-competences defined in Table 3.

And to reinforce these, the following topics are marked in year 9 or 10. We have chosen a topic based on clothes, linked to the theme of consumption and fashion, as the basis for our work (Table 4).

In the description of the topic it is stated that students should recognise the characteristics of conscious consumption, understand the processes of consumer society and seek solutions to the problems of overconsumption, while striving to be able to apply methods that are as sustainable as possible.

Preliminary knowledge assessment

The preliminary knowledge survey was conducted anonymously using response slips. Students were asked to write the answer to the question on a slip of paper, so that we could check the results afterwards.

The results obtained for our first question: Circular economy is a relatively unknown concept among students according to the results (Fig. 9).

It can be seen that there were students in both classes who had heard of the topic we will be looking at later, but the next question, "Do you know its meaning?" was the one question that most answered no, as none of the students could determine its meaning. Most of them identified it as an agricultural term. Here we think that the conceptual confusion with shifting cultivation may have caused this result.

Table 3 Sub-competences in the sustainability subject curriculum

ABILITIES, SKILLS	KNOWLEDGE	ATTITUDE
Students discover the link between their own consumption and lifestyle habits and natural and environmental problems. They can identify and give examples of what can be changed.	*Concepts:* sustainable development and sustainability; ecosystem services.	The student is committed to moving towards sustainable development and preserving environmental values, committed to building just, peaceful, cooperative communities and societies. The student feels and assumes responsibility for the preservation of his or her own activities and the natural environment, and for cooperation with his or her social environment.
Create a simple resource plan. It is realistic and matches their priorities, the time needed for activities and the sustainable use of available resources.	*Concepts:* vision; aspects of time management (complexity, prioritisation, measurement). *Processes:* how to plan a vision.	
Design and implement a programme of work - based on specified criteria - to achieve sustainability. Students analyse, evaluate and present the results of their work.	*Concepts:* work programme and project; difference between needs and wants. *Processes:* steps in work programme planning.	
By analysing a specific problem, students recognise the interrelationships between the natural and built environment, individual behaviour and the socio-economic space that surrounds them. Based on aspects, they analyse, review, and recommend decisions that help sustainability.	*Skills:* identifying the characteristics of systems, their elements and the relationships between them. *Processes:* how to analyse inter-dependencies.	

Table 4 Topics in the sustainability curriculum for grades 9 and 10

NAME OF TOPIC	PROPOSED NUMBER OF HOURS
The meaning and objectives of sustainable development	2 hours
Self-sustaining nature	5 hours
Consumption, fashion, recreation	6 hours
Keeping healthy in an environmentally conscious way	6 hours
Room, building, municipality	6 hours
Recreation, transport, traffic	5 hours
Forward-looking	4 hours
Total number of lessons	34 hours

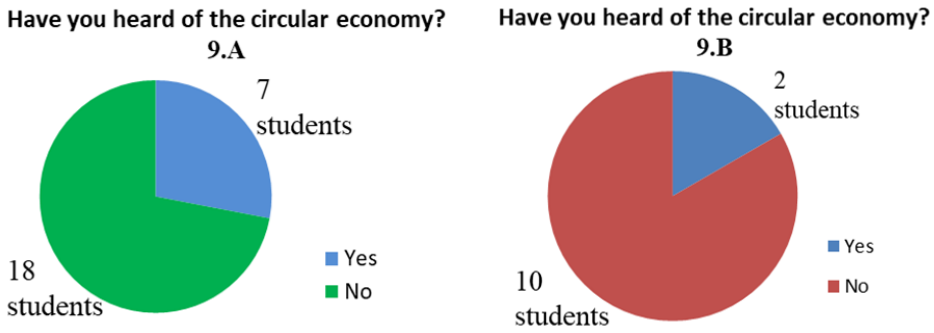

Fig.9 Results for class 9.A and 9.B

Timeframes for the draft

Then the knowledge of clothes from the previous lessons was reviewed, where the materials used for making clothes, their manufacturing and their impact on the environment were discussed.

In the following steps, we analysed both the video material and the accompanying diagrams, learning the concepts of the linear and circular economy and the difference between the two. After this, we set the task for the groups to complete. Both classes were given the same task: to design a recycled or reused garment based on circular economy, either through programs or through some methods. The preparation of these products was eventually given to the students as homework and was completed with varying degrees of success. Some groups did not produce a product or only a part of one.

Our experience has shown that it is possible to predict how long the drafting stages will take roughly. Thus, with the addition of the time periods, the draft timetable looks different. Our experience has also indicated that this session is not just a single lesson but a draft that can be used over several hours, even as a theme week, especially if specific ideas are planned to be implemented with the students.

Our draft with time frames exhibits the real-time implementation of the project (Table 5).

Post-assessment of knowledge

As a post-test, both classes were asked to compare linear economy with circular economy. The result of this survey was 100% because all students could articulate the differences between the two economic methods. They understood the differences between the two methods and, looking at their work, we can say that most of them were able to apply the knowledge they had acquired.

When we asked them why they thought sustainability was important, they gave very different answers, but one thing they all had in common was that past mistakes must be solved in the present in order to have a viable future. They were all able to articulate that the importance of sustainability is to ensure that our society can sustain itself in the future while living in symbiosis with nature.

Table 5 Time frames of the project

	TIME	CONTENT	CLASS ORGANISATION MODE	METHOD	INSTRUMENT
1.	5 min	*Prior knowledge assessment* Answering oral questions using answer sheets.	Individual work	Questionnaire (questionnaire card)	Reply card
2.	5 min	*New knowledge acquisition* The students watch the video tutorial, discuss the content of the video and gather the main points.	Frontal work	Film analysis	Instructional video
3.	20 min	*Capturing new knowledge* After discussing the content of the video, compare the linear economy and the circular economy using diagrams.	Frontal work	1. Film analysis 2. Figure analysis 3. Asking for discussion	Smartboard Computer Powerpoint slides
4.	3 min	*Setting a task* To devise a method or programme for recycling or reusing clothes in a circular economy, for which a promotional poster and a description should be created.	Frontal work	Teacher's statement	-
5.	45 min	*Performing a group exercise* (In our case, it was assigned as *homework* in the end)	Teamwork	4. Getting a job 5. Cooperative group work	Phone Computer
6.	20-30 min	*Presentation of products* Each group presents its poster and explains what programme or method it represents.	Frontal work	Presentation	Computer Products

Students' products

First: A poster of the students' "Shot Now" printed T-shirts, which can be individually styled. Custom printing on recycled fabric T-shirts makes them personalised (Fig. 10).

Second: With the "Ultra shoes" project, the students aim to create fashionable and on-trend shoes by recycling old clothes (Fig. 11).

Third: As part of the "UHS Plan", students planned a cross-country clothing drive, where people could even swap clothes (Fig. 12).

Fourth: "Reuse wisely", where students will collect used clothes for animal shelters for animal clothes, blankets and bedding (Fig. 13).

Fifth: "Rags in a new guise" where students will use second-hand clothes and other recyclable products to produce workwear in an economical way (Fig. 14).

Fig.10 Hand-designed poster of "Shot Now" printed T-shirts by students

Fig.11 Poster of the "Ultra shoes" programme designed by students

Fig.12 Student-designed poster of the "UHS Plan" programme

Fig.13 Student-designed poster for the "Use smartly again" programme

Fig.14 "Rags in new clothes" poster designed by students

DISCUSION

According to numerous national and inernational studies, the importance of practical education is very high. In the class, we therefore tried to find a practical exercise that could be done in groups. We tried to develop their creativity by having the students design a poster themselves.

The literature we have studied highlights the common point of sustainability pedagogy and environmental education, which is to develop the motivation to act on sustainability issues, with the aim of finding a long-term solution. We believe that the idea of reusing clothes supports the idea of long-term solutions, as students give a new function to a garment they have worn and loved for a long time so that it can be kept in further use.

In both courses, sustainability awareness plays an important role, which we supported by looking at their training documents when presenting the results.

CONCLUSION

Sustainability has been a burning issue in the daily lives of humanity for several decades, as our future can only be secured if we can strive for sustainability now. We must achieve this in education. In Hungary, other subjects will be given the role of educating students about sustainability. In our work, we wanted to find out how sustainability fits in a technical school where the role of professional knowledge is very high and how far it can be integrated into the training of a professional. Based on the documents that define their education, we can state that sustainability is absolutely present not only in their education but also in their future work, so it is essential that these students are also equipped with the necessary knowledge on this subject. The deepening of this knowledge cannot always be achieved within the framework of a lesson consisting only of frontal sections. Today's Generation Z (and since 2010, the alpha generation) young people require more stimuli, so it is important to give them a greater variety of ways to transfer and deepen the knowledge they have acquired. We can prove that a great way to do this is for students to work in groups or even individually to put together a product based on what they have learned so that we can deepen the knowledge acquired by our students almost immediately while developing the competences that will help them to become more fully-fledged members of society in the future.

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