



Sustainable thinking in VET practice



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Table of contents

1.	2	
2.	2	
3.	3	
4.	4	
4.1	Title	4
4.2	Title	4
5.	5	
5.1	Title	5
5.2	Title	5
6.	6	
6.1	Title	5
6.2	Title	5
7.	9	
7.1	Title	5
7.2	Title	5
8.	8	
9.	11	
10.	12	
11.	12	

Table of figures

Figure 1:	Example 1	4
Figure 2:	Example 2	4

1. Introduction

[Insert text for a small introduction of the module. The length of the text should not be less than 200 words and more than 500 words. The introduction should be in one page.]

School Center Škofja Loka (SC Škofja Loka) has been providing vocational and technical education and training in the fields of mechanical and wood engineering since 1889 - at that time so-called a crafts school. SC Škofja Loka has four organizational units,

- Secondary vocational and technical school of mechanical engineering (755 students)
- Secondary vocational and technical school of wood engineering (284 students)
- Higher vocational college of mechanical and wood engineering (300 students)
- Business-to-Business Training Center (MIC) (cooperation between the school and industry).

In the module, we present examples of good practices that we have implemented at SC Škofja Loka in the field of promoting and raising awareness of the orientation towards green and sustainable technologies, the circular economy and digitalisation as a tool for effectively achieving these goals. We will focus mainly on practical examples, which also show the gradual development of our sustainability orientation over the last 10 years. We start by presenting the basic concept necessary for the effective implementation of the core mission of SC Škofja Loka, which is reflected in the construction of a new energy-efficient MIC building, with integrated systems to promote energy and material efficiency. We continue by presenting the importance and effectiveness of a well-performed energy renovation of the older buildings of SC Škofja Loka. In the third part, we present examples of implemented projects in the field of woodworking and mechanical engineering, which present, in a very practical way, one of the possible ways of strengthening a sustainable and green technology-oriented educational process.

We conclude with a look at our plans for a green and sustainable future, underlining the responsibility we have as technical education institutions to achieve this goal.

2. Key words

[Insert the key words of the module. The key words should be in bold font and separated by comma, as in the example.]

Example:

1st key word, 2nd key word, 5th key word ,

sustainability in VET, energy and material efficiency, digitization, central control system, project work, cooperation with companies, building a learning community, development and Innovation, transfer of knowledge,

3. Learning Objectives

[Insert specific objectives that the learners are going to read and learn from this module. The learning objectives should be described in approximately 2-3 sentences. Use bullet points, as in the example.]

Example:

- Bullet point for learning objectives - general level of modul- adds Francesco.

4. Unit 1

The BBTC building – the green orientation in development

[Insert text for the Unit 1 of this module. The length of the whole module should be approximately 10-15 pages.]

With the construction and, in 2013, the opening of a new Business-Business Training Centre, we have established the basis for sustainable development, in particular by installing the systems for the highest possible level of energy and material efficiency.

- New technologies (advanced CNC didactic solutions), new machines, tools, installations and effective building insulation,
- Heating system implemented with heat pumps,
- Smart lights and weather controlled blinds
- Openness to digitisation and energy saving systems, integrated into the central control system (CCS)
- Use of rainwater (e.g. for toilets) - to reduce drinking water consumption

4.1 Bussines to bussines training center Škofja Loka (BBTC)



Figure 1: Example 1

5. Unit 2 Comprehensive energy renovation of buildings

[Insert text]

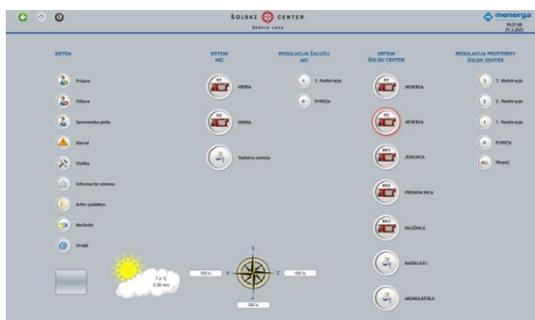
The old buildings of SC Škofja Loka were built between 1975 and 1980 and were extremely energy-inefficient. Therefore, in 2013 we carried out a comprehensive energy renovation of all 5 buildings of SC Škofja Loka with the following measures:

- Execution of a new heat-insulating facade and thermal insulation of the ceiling (stone wool),
- Replacement of old windows and doors,
- Replacement of the boiler - the heating oil boiler was replaced by a wood chip boiler,
- Heating system - reconstruction of distributor and control, reconstruction of secondary distribution and heating elements,
- New ventilation system and user awareness,
- Reconstruction of internal lighting with smart system,
- Digital monitoring of operations and central control system (DOM, CCS).

5.1 Construction and installation measures



5.2 Digital monitoring of operations and central control system (DOM, CCS)



5.3 Effectiveness of the implemented measures

- On average, more than 50% savings in energy for heating SCSL,
- 15% saving in electricity compared to the starting point,
- Significantly greater living comfort,
- Systems and devices are also included in the learning processes of SC Škofja Loka and BBTC,
- Incentive for further steps towards digitization and upgrading of existing solutions,
- Strengthening the focus on green, circular and sustainable in all segments of the SCSL operations.

6. Unit 3

Activities and direction of educational activities for sustainable development and continuous green transition

The above stated activities have a double meaning: they ensure the actual daily application of green and sustainable solutions, and at the same time they represent real didactic examples that can be integrated into the educational processes of SC Škofja Loka at any time. The results are a reflection of the excellent cooperation with partner companies, which, like SC Škofja Loka, are committed to finding innovative and sustainable solutions in the fields of mechanical engineering, woodworking and energy. On this basis, we are now strongly strengthening the implementation of projects aimed at a green and sustainable future and strengthening our responsibility towards the environment.

In the following, we present two examples of such projects: one in the field of wood engineering and the other in the field of mechanical engineering, and in chapter 10 we provide links to a number of other projects that have been or are being implemented at the SC Škofja Loka level and support sustainable development, green and digital transition.

6.1 Projekt »Podnebni cilji in vsebine v vzgoji in izobraževanju« (PCVIZ) Project "Climate goals and contents in education"

[Insert text]

The project is implemented at Secondary School of Mechanical Engineering in SC Škofja Loka and in cooperation with CPI (The Institute for Vocational Education).

The aim is to follow the needs of the economy and its development by working together to create sustainable, circular and economically and environmentally friendly. An interdisciplinary team of expert teachers at school is in charge of planning and implementing activities with students and networking with relevant partners in the local and regional environment.

In the second half of 2022, the following activities were carried out:

Over the summer, we collected a number of found objects, including sneakers, trousers, T-shirts, work clothes, etc. In cooperation with a boarding school, we washed the clothes and offered them to the boarding school students. The work clothes were put into the storage to be made available to the students.

To reduce the use of paper, we have printed the signs for PT meetings and we stick them on the classroom door every month when we have afternoon PT meetings. The signs are also laminated, which makes them reusable (e.g. for future school years).

In order to reduce paper consumption, we have decided to keep the minutes of the meetings only electronically in an online classroom – teachers room. Also, the circulars are brought to class on a tablet by a student on duty and no longer in paper form.

We have drafted a set of guidelines for the final assignments, which includes a specific section on sustainable development.

We participated in the Girls go Circular project with the students from 2. GaV class and the girls completed all the modules and obtained all the certificates, and the boys all obtained at least two certificates.

We took part in an innovation camp with the students in JA Slovenia, where they had a challenge to reuse old electrical appliances.

Activities in preparation or under implementation include:

- We will set up a place to dispose of hazardous waste, e.g. oil filters, motor oil, waste rags, etc.
- We will liaise with the industry (Ekol) and the local community (Komunala Škofja Loka).
- We will purchase cases for water analysis to be used in the elective course Waste Materials Management and in Energy Studies. To increase the motivation of the students, they will carry out the analysis on water samples they bring from home to check the quality of the water in their home environment. In addition, tap water will be analysed at school. This will show students that tap water is drinkable and try to get as many students as possible to drink tap water, not plastic bottles bought from the supermarket.
- In the school subject Business and Organisation and Organisation and Business, we will encourage students to create a business model of how, for example, we can use scrap metal, waste goods for a new product - reusing materials in engineering.
- We will participate in projects (JA Slovenia, EIT Raw Materials, Girls Go Circular).
- We will guide students to produce final assignments involving the use of waste materials from the field of mechanical engineering (e.g. waste materials from end-of-life cars, separation of these wastes).
- We have added sustainable development in the instructions for the final assignments. Students will be asked to identify what happens to the waste generated in the production of their final assignment.
- A long-term objective that we will not be able to achieve in one school year is to set up an outdoor classroom, which would include an open-air and a covered area (a space for this has already been identified);

6.2 Project “Lesni feniks” - the Wood Phoenix

The project is implemented at Secondary School of Wood Engineering in SC Škofja Loka and in cooperation with partners from the local and regional environment.

The main aim of the project is to protect the environment by reducing waste, preventing waste and reusing materials, and to raise awareness among local residents about the ways, possibilities and importance of the transition to a circular economy.

The objectives of the Wood Phoenix project are:

- to carry out a pilot project on the use of wood residues and salvaged wood, which will be used to create new products: urban wooden elements to be used by local residents. The wooden benches and playgrounds will complement the swimming pool in the municipality of Žiri.
- Awareness-raising of the local population through a series of activities.

In addition to round tables, lectures and films to raise public awareness, the project will extend the learning process by developing products made from salvaged wood and by producing and demonstrating the use of salvaged wood in urban infrastructure.

An important added value of the project is the cooperation established between the industry, educational institutions and the local community.

7. Summary

Based on the activities and projects presented, it can be concluded that the integration of sustainable and green content in the educational activities of VET institutions is of a paramount importance. With a proactive approach, it is possible to implement quality projects, both in technical and general education, which orient the trainees towards a responsible attitude towards the environment and foster a mentality of innovation and entrepreneurship that is fundamentally oriented towards sustainable technological solutions. Digitalisation fits perfectly into this context, as an effective tool for achieving the objectives presented.

Successful projects are the best motivation for launching new activities, subject to continuous improvement, which translate new technological possibilities and trends into practice in real time.

In particular, the following factors are key to achieving quality results:

- the people involved, as personally responsible and highly professional individuals,
- teamwork,
- openness to cooperation with different stakeholders
- openness to lifelong learning and the creation of a learning community
- a willingness to enhance the best potential of both the individual and the various social communities.

By responsibly building a culture of cooperation between education and business, SC Škofja Loka is "creating GOOD STORIES"!

8. Questions for reflection

[Insert text for the questions for reflection. The questions should be focused on the topics that were written in the module. The purpose of the questions is to make the learning process more effective. Approximately 3-4 questions.]

1. What technical measures have you already implemented or you think they could be implemented in your organisation to achieve greater energy efficiency (measures on buildings, building materials, installations and management systems)?
2. Identify 3 potential partners (companies, BSO, development agency, municipality,...) in which you see potential and possibility to strengthen cooperation for joint projects focused on sustainable development and circular economy!
3. Which actions to promote sustainable development and the use of green technologies can you immediately activate in your organisation? (2 examples)
4. Which content areas of the green transition in your organisation have the greatest potential for development in the short term (in the next 5 years)?
5. How would you describe the use of digitalisation as a tool to accelerate the green transition in your organisation and local environment?
6. Which priority topics will you integrate into your educational curricula or activate in the form of project work in the next two years?

9. Useful References and Resources

[Insert text for useful references and resources. Ex. Papers, videos, articles. Approximately 2-3 useful references.]

- 1) Text format or link- www.scsl.si/projekti/
- 2) <https://scsl.si/srednja-sola-za-strojninstvo/o-soli-sss>
- 3) <http://www.lesnifeniks.si>
- 4) [Enersol | Šolski center Škofja Loka \(scsl.si\)](http://enersol.si) (projects on renewable sources of energy)

10. Bibliography

[Insert the sources that were used for the module. Use APA Style]

Green Skills

Education, Training, Innovation



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