REPUBLIC OF SLOVENIA
MINISTRY OF COHESION
AND REGIONAL DEVELOPMENT

Norway
grants

Project »Academy for combined learning«

Combined learning model for vocational education in the field of mechanical engineering and development of competencies of students and teachers for digital education

Why the project Academy for combined learning?

Teachers face the challenge of providing quality teaching in traditional and distance learning formats. We expect them to adapt their teaching methods and didactic approaches, so they can better prepare students for the challenges of the 21st century.

To do this, they need appropriate content, didactic and digital support, modern learning model and digital tools and platforms.

The Combined Learning Model for Secondary Vocational Education in the field of Mechanical engineering and the development of students' and teachers' competences for digital education is co-financed by Norway through the Norwegian Financial Mechanism in the amount of EUR 823. 296. The project aims to develop an innovative hybrid model for education in professional programmes in the field of mechanical engineering. The project duration is from 1 June 2022 to 30 April 2024. More information about the project at https://www.academycole.si/.

The Norwegian Financial Mechanism, which is funded by Norway alone, is aimed at countries that have acceded to the European Union since 2003. Total amount of funds within the framework of the Norwegian financial mechanism in the period 2014-2021 amounts to EUR 1.25 billion.

The priority areas for this period have been:

1. innovation, research, education and competitiveness;
2. social inclusion, youth employment and poverty reduction;
3. environment, energy, climate change and low carbon economy;
4. culture, civil society, good governance and fundamental rights and freedoms;
5. justice and Home Affairs.

About the project

Working together for a green, competitive and inclusive Europe

With an increasing use of modern technologies, automatisation and robotisation, modern ways of working demand a different way of teaching and a different way of motivating students. This is because the students are expected to step out of the education system empowered with relevant skills, independent and self-initiating.

Teachers today face the challenge of how to create, use and transfer best practices in their own teaching environment, although they are often restricted with relevant digital competences and a lack of learning models.

In this project we aim to connect teachers (including the Norwegian teachers) and connect them outside the education system, in order to exchange knowledge and good practices in the field of skills and competences promotion and development both teachers and students in secondary vocational education.

The developed and upgraded e-materials, methods of work and newly acquired digital and didactic competences, will also be applicable at other levels of education and other professional fields, such as construction, energy, mechatronics.

The lead partner organisation

ROKUS Klett

Project partners

Univerza v Ljubljani
Fakulteta za strojništvo

CPU Center za poslovno usposabljanje
Gospodarska zbornica Slovenije

Šolski center Novo mesto

GYLDENDAL

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More information on the project at: https://www.academycole.si/en/
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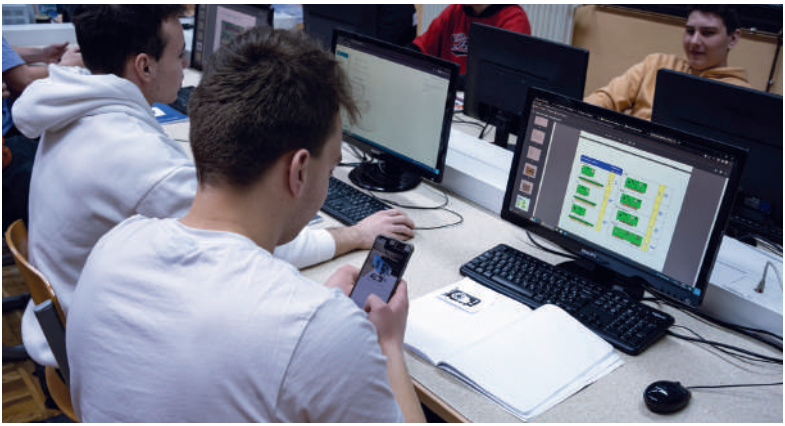
The main goal of the project

The main objective of the project is to create a digital learning environment based on institutional integration at several levels of vocational education and economy, including international integration, with a purpose of digitalization of teaching, developing new teaching and learning practices and accelerating skills and competences in education.

The cornerstone of the environment is a combined learning model that effectively exploits the digital learning platform and digital tools for its implementation.

The project's key objectives

- Develop a combined learning model for secondary vocational education that allows hybrid teaching and learning with the possibility of implementation in higher education.
- The specific objective of the project is to train and raise the competences of teachers in the secondary vocational education level for the 21st century, with a primary focus on learning, problem solving, critical thinking, initiative and entrepreneurship. The teachers will use the acquired competences to implement the curriculum into practice.
- Training mentors as multipliers who will transfer knowledge to new teachers.
- Training students so that they can make better use of modern learning methods.
- Partnerships will be established between educational and other institutions (economy, industry, educational and research institutions).
- Dissemination of good practices with the help of a project partner from Norway to the Slovenian space.
- Transferring results and practices to other professional areas.
- Contribute to increasing women's motivation to engage in technical professions.



Learning with combined learning models, Šolski center Novo mesto

Expected Results

Working together for a green, competitive and inclusive Europe

- A combined learning model developed for digital teaching and an upgraded digital platform to support the implementation and use of digital tools.
- An interactive teaching materials developed (teacher's manual, textbooks for students).
- A network of institutional partners is established.
- Trained teachers and multipliers.
- Pilot implementation and mutual learning activities carried out in 6 school centres in Slovenia.
- 7 intellectual effects developed (5 teaching materials for students and 2 teacher manuals).
- Modular design of the platform, which will allow the reuse of the content both in the context of a secondary vocational education in mechanical engineering, as well as in other professional fields and educational programs.
- Ability to upgrade the digital platform with new functional approaches.
- 9 mutual learning activities carried out (6 training sessions and 3 mutual learning activities).
- Promotion of the project through round tables, conferences, digital media, a special website, in other various media outlets and informing on project funders.
- Exchange of best practices, including through the transfer of knowledge from the Norwegian education system to the Slovenian space (result of a study visit in Norway).
- Analysis of the material in terms of the effectiveness of the methods.

The project in numbers

5
Teaching materials for students developed

2
Manuals for teachers developed

6
Included school centres

60
Participants in mutual learning

3
Qualified multipliers

20
Qualified teachers

60
Included students

Development of teaching materials and manuals for teachers

The „Academy for Combined Learning“ project will offer 5 learning materials for students and 2 teaching guides for teachers or professors.

Teaching materials for students:

1. Computer-based technologies for the programme Mechanical Engineering Technician;
2. Computer-based technologies for the programme Mechanical Engineer (3+2);
3. Spatial modelling and documentation preparation for the programme Mechanical Engineering Technician;
4. Spatial modelling and documentation preparation for the programme Mechatronics Technician;
5. Machine elements.

Testing of materials and training of multipliers

The materials are being intensively developed by a team of practising teachers. In order to make them as useful as possible, they will first be tested by multipliers. In addition to the focus on the expertise of the content. The content and practical application will also be presented, with the purpose of developing 21st century competencies. Participants will evaluate the materials and, if necessary, suggest additions and improvements.

In the second phase, the materials will be presented to users, i.e. teachers of the vocational classes in the mechanical engineering program. In the last phase, the materials will be presented to students too.

Learning to learn, Strømmen Upper Secondary school, Viken, Norway

Recommendations for the learning plan model preparation, as shown in the analysis of teacher needs in Secondary Vocational education - Machine engineering

The analysis dealt with teachers of vocational subjects in the programme Mechanical Engineering Technician, who also teach in other programmes. The results are a useful guide for the development of teaching materials for classical teaching, with a focus on distance teaching and learning.

The teachers involved in the analysis suggested:

- a desire to upgrade teaching materials in the areas of: control and electrical components, materials processing, material properties and primary materials and primary design, tools and devices for mass production, design of manufacturing processes, automation and robotization, energy systems;
- a desire to upgrade basic knowledge;
- the use of more pictorial material in textbooks (pictures, diagrams, graphs);
- more working materials (worksheets) with problems of practical examples;
- teachers supported the linking of professional knowledge with mathematics and physics;
- textbooks should also include information on soft skills (problem solving, critical thinking, group work);
- they also wished for links to useful websites.

Recommendations for the learning plan model preparation from the representatives of companies

More than 60 company representatives participated in the focus groups, including from the the metal industry, automotive industry, paper industry, as well as the companys that use plastics materials.

According to industry representatives, here are the expected competencies of students and employees for easier management of challenges in the 21st century:

- the ability to handle hand tools, the ability to do physical work, manual dexterity, optical detection, knowledge of various measuring instruments;
- handling CNC machines and knowledge of programming;
- a combination of mechanical and electrical skills, including IT skills, mathematics, physics, construction;
- sheet metal processing skills (milling, turning, welding), including machining plastics, knowledge of materials, computer, digital skills, 3D modelling, Industry 4.0 skills;
- knowledge of machine elements;
- the ability to work in a team, basic communication skills, employers note that students need to build confidence and work independently;
- use of new technologies, including lasers;
- understanding of technical documentation, knowledge of how to handle machine manuals and knowledge of how to use different knowledge materials;
- health protection in the workplace, including environmental protection.