I LIVE WITH INDUSTRY 4.0

Titlul proiectului: **I LIVE WITH INDUSTRY 4.0 (ID: 150650)**

Perioada de implementare: **13.02.2024 – 20.06.2024**

Țări partenere: **Turcia, România**

Parteneri din școală: **Nedelcu Claudia, Căpraru Claudiu-Ionuț (profesor fondator proiect)**

Collaboration between partner schools

Our “I Live With Industry 4.0” eTwinning project consists of 86 people in total, including 13 teachers and 73 students. It was held with the participation of teachers from a total of 6 schools: 2 schools from Romania, 3 schools from Eskişehir, and 1 school from Mersin. Our schools are at high school level; It consists of 1 Science High School and 8 Vocational and Technical Anatolian High Schools. Collaboration was made with the project partners, teachers and students, through the Twinspace area; Continuous communication and interaction was achieved through email, online meetings, forum, eTwinning, Webinar, WhatsApp, Instagram and Zoom tools. Both teacher and student groups were formed and tasks were distributed.

The project's activities were well defined from the beginning so that they could be carried out collaboratively (detailed in the "Our Goals" and "Our Work Calendar" pages). Thus, work teams were formed, and responsibilities were divided (detailed on the "Our Task Distribution" page).

In the first stage of the project, the students had to create a logo and a poster of the project in teams. Based on the votes given by the teachers and students participating in the project, a logo and a poster were chosen to represent our project.

The students had to create a product choosing one of the following areas of use of Industry 4.0:

- Internet of Things

- Virtual Reality

- Augmented Reality with 3D Printing

- Digital Learning Platforms (utilization of web 2.0 tools)

- Artificial Intelligence

- Industrial Internet of Things (IIoT)

- Smart Manufacturing

- Connected Manufacturing

- Smart Factories

- Cloud Computing

- Cognitive Computing

- Cyber-Physical Systems

I had weekly meetings with the students where I planned and realized two robotics projects: Automatic flower watering robot and a Smart house.

The students started with the research part where they documented how to make the robots, then moved on to the design and implementation stage. After completing the hardware realization stage of the robots, their programming followed. Each stage involved collaborative work and many discovery learning activities.

Use of technology

Since the project activities were carried out remotely and their realization often involved collaboration between teachers and students from different countries, it was necessary to integrate a variety of web 2.0 applications to achieve them efficiently. These include Google Forms, Padlet, Canva, Copilot, mindMeister, keamk, Bitmoji, Chatterpix.

Parents and students have signed documents regarding the processing of personal data and have been informed of their legal obligations regarding the use of copyrighted information in the creation of project materials and products.

Pedagogical approaches

Competences and examples of learning activities:

1. Explaining the way some cyber-physical devices work in the context of the transition to industries 4.0 and 5.0

1.1. Identifying the component parts of a robot and how they work

1.2. Explaining how the mechatronic systems that make up robot's work

2. Practicing computational thinking in various real/virtual robot programming contexts

2.1. Experimenting with algorithms for operating the mechanisms of a robot, for movement in space

2.2. Implementation of algorithms in different development environments, for robot programming

3. Creative development of STEM products that leverage the connections between robots, life and society

3.1. Integrating knowledge of mathematics, physics and computer science to design and build robots

3.2. Realization of STEM projects as a team, using robots based on a microcontroller

I used the following didactic methods during the development

project activities: scientific investigation and realization of projects with practical purpose.

The scientific investigation will be carried out in compliance with its stages:

- Identification of the problem to be investigated

- Formulation of a working hypothesis, which will be tested

- Documentation of the identified problem, using different sources of information

- Carrying out the investigation in accordance with a given plan and verifying the hypothesis at the end of the investigation

- Analyzing the results

- Conclusions of the investigation regarding the results achieved, as well as the learning process followed by the students.

Examples of scientific investigation: simple movements of robots using specific algorithms, using simple mechanisms in practical situations: raising/lowering weights with their help, using the technical notebook (technical characteristics of the project, block diagram of the robot, etc.).

Curricular integration

During the project, we tried to develop students a series of competencies and skills necessary for the 21st century. Our goals were:

1. To enable students to create original products by working together in interaction through peer learning.
2. To ensure that they specialize in that subject while sharing the products they design with their project partners.
3. Providing learning environments for students to improve themselves while gaining new knowledge and skills.
4. To reinforce students' awareness of responsibility
5. Ensuring students learn with fun
6. To make the knowledge and skills they will gain permanent
7. To enable students to discover their talents while learning
8. Ensuring that students are in touch with technology by improving their digital skills
9. Combining the knowledge and skills they have learned with an interdisciplinary approach
10. Facilitating students' adaptation to industrial fields after graduation
11. Ensuring the use of technology at every stage of lessons

12. Enabling students to distinguish between useful and harmful information while improving their research skills.
13. To raise awareness that they can be at every stage of production by increasing their self-confidence with their own designed products.

Results and documentation

1. Our students will have the opportunity to share and transfer their knowledge and skills, primarily professionally.
2. Our students will experience different professional skills and be in active learning environments.
3. Our students; Feelings such as cooperation, cooperation and empathic behavior will develop.
4. He/she will experience socializing with students from different cultures and countries.
5. It will contribute to the skills of being open to ideas, critical thinking, brainstorming, and project-based learning.
6. Our students will also raise professional awareness
7. Will use online tools, prepare course content, and learn project preparation techniques.
8. Students' awareness of responsibility will be strengthened,
9. Students will be enabled to learn while having fun
10. The knowledge and skills they will gain will become permanent
11. Students will be enabled to discover their talents while learning
12. They will be provided with experiences and learning by doing, using different Web 2.0 tools.
13. In the digital age, they will raise awareness as producers, not consumers
14. Protection of personal data, e-Security, raising awareness on social media and raising students' awareness
15. Supporting the reduction of cyberbullying by improving digital literacy skills and ensuring the protection of personal data
16. To ensure that students increase their self-confidence in collaborative and innovative working environments with local and foreign partners,
17. To encourage students to see good examples of digital data production, to recognize and use the tools used to produce data.
18. Supporting students with the school program and components to interact creatively with digital technology
19. Allowing students to improve their foreign language skills
20. At the end of the project, all members were thanked by the managers for their devoted work and given a "Certificate of Participation".

My contribution

I and my colleague from Turkey, Ayşegül GÖÇGEN, were the two founding teachers of the project. Together we coordinated the activities of the "I Live With Industry 4.0" project. I collaborated in the creation of the calendar, rules and objectives of the project, in the distribution of tasks to the members of the project team. I contributed to the creation and completion of the project page on the TwinSpace platform.

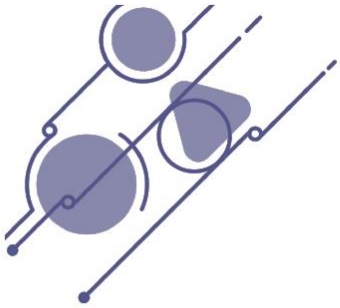
I created students' accounts on the TwinSpace platform and guided them in making two products for the project: Automatic flower watering robot and a Smart house.

As an expert teacher, I held a webinar on the basics of robotics, attended by both the students involved in the project and the coordinating teachers. I presented information about What is a robot, Classification of robots, Robotics applications, The senses of robots (Microcontrollers, sensors, engines, servomotors, relays, ports, actuators, etc.) and Software for robotics (Open Roberta Lab, TinkerCad Circuits, Arduino IDE).

Link proiect

URL: https://school-education.ec.europa.eu/en/etwinning/projects/i-live-industry-40

European Quality Label profesori



eTwinning European QUALITY LABEL

Claudiu-Ionuț Căpraru

Colegiul National Pedagogic Constantin Cantacuzino, Targoviste2, Romania

is awarded with the European Quality Label

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I Live With Industry 4.0

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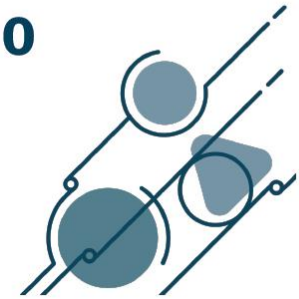

eTwinning Funded by the European Union

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eTwinning National
QUALITY LABEL

Nedelcu Claudia

Colegiul National Pedagogic Constantin Cantacuzino, Targoviste2, Romania

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for the project:

I Live With Industry 4.0

01.10.2024

The recipient of this certificate has demonstrated a high level of digital competence according to theEuropean Framework for the Digital Competence of Educators and the SELFIEforTEACHERS toolkit. This certificate can therefore be used as evidence to support an application for the Educators' Digital Competence Certificate provided by the European School Education Platform. For more information on how to obtain the Educators' Digital Competence Certificate see here.

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European School Education Platform

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Certificate profesori

Certificate elevi

eTwinning

CERTIFICATE OF PARTICIPATION

Ionașcu Călin-Mihai

Thank you for your contributions to our " I Live With Industry 4.0 " eTwinning project (2023-2024). We wish you success in your work.

CĂPRARU CLAUDIU
Project Coordinator

MAREȘ SILVIA
School Principal

eTwinning

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Ivan Sara-Ioana

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Mircioiu David-Georgian
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Petrescu Ioana-Cristina
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Sasu Antonio-Sebastian

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Voicu Natașa-Elena

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