Dacia Pitesti Technological High School

REPORT

Learning/Teaching/Training activities

5-oji gimnazija, Panevėžys Lituania

September 30 - October 4, 2019

The third Learning / Teaching / Training activity took place in Panavezys, Lithuania at the theoretical high school: 5-oji gimnazija, Panevėžys, between September 30 and October 4, 2019, with the participation of 6 students from partner high schools in Italy and Turkey has 7 students from Romania.

The participating students from the host country, Lithuania, participated in all the activities carried out within the mobility. Each group of students from the strategic partnership were accompanied by 2 teachers, and those from Romania by 3 teachers.

The preparation for participation in mobility consisted of:

- Skype conference with partners, in September 2019, to establish the Mobility Agenda;

- selection of students according to their degree of involvement in project activities;

- drawing up Commitments between the students participating in the mobility, their parents and the school, for information on the necessary documents, the obligations of the parties and the grant offered;

- issuing notarial power of attorney for minor students participating in mobility;

- obtaining the criminal record for the accompanying teachers (where required);

- informing the School Inspectorates in whose jurisdiction the partner schools are located regarding the period of LTT activities in Lithuania;

- drawing up the e-portfolio with the presentations and materials needed to carry out the LTT activities in Lithuania;

- training the participating students, in order to improve their communication skills in English;

- the purchase of airline tickets and accommodation reservations, as well as the provision of transfers to and from airports.- validarea certificatelor Europass de catre Centrul National Europass.

The purpose of LTT mobility in Lithuania was to develop communication, socialization, teamwork and project skills, critical thinking and problem solving by learning programming using the STEM concept - Science, Technology, Engineering and Mathematics. To obtain these results, the Lithuanian partner proposed the programming language with LEGO and the platform https://education.lego.com/en-us/support/mindstorms-ev 3, where students learned to build and program robots.

Through the "Robot Game: Build and program an autonomous LEGO MINDSTORMS robot", the project team from Lithuania aimed to get as many students involved to find out as much as possible about the scientific part behind this challenging topic and to find solutions. of real life problems in this area.

Developing mobile applications, evaluating project activities, sharing information and impressions were the main targets of this learning activity. STEM learning with LEGO is a program dedicated to students (14-19 years old) that aims to present the fascinating world of science and technology through a sports approach. Objectives of the activity: promotion of innovative pedagogical methods, promotion of open education and innovative practices in the new digital age, use and development of OER resources. The methods used were: problem solving, project-based learning, collaborative, student-centered learning and active learning.

On the first day of the mobility, the students from the target group answered the questionnaire to establish the initial level. The initiation of the students from the target group in learning STEM with LEGO Mindstorm was done by the students from the host high school and the computer science teacher Jolita Stankevičienė in the IT laboratory. The students of the host team presented their built robots. The teacher set the tasks for all students in the partner high schools, for the whole week in which the mobility took place, all activities aimed at building LEGO Mindstorm robots and using online instructions for programming the robots, so that they fulfill their chosen missions.

In the high school's festivities hall, the students of the host team presented their own LEGO Mindstorm robots built and creatively programmed. All the project partners watched how the built robots move, how they fulfill their various missions and what were the stages of their construction. Thus, the first robot was programmed to play a music song, the second robot was controlled by another used as a remote control and was able to move through obstacles, and the third robot was a Morse code translator.

Next, a Power Point about 3D printing was designed, which presented information about how the printer works, what materials it uses, and what steps you need to take to print an object. All participants had the opportunity to see how the 3D printer works and the products made with it.

The teams of one student from each partner country were formed through a game. The Lithuanian students presented the robots they built and their missions, robots that were to be built by the guest student teams as well. The necessary theoretical notions were transmitted, based on LEGO Mindstorms EV3 using the online environment. The activity took place in the computer science laboratory, under the guidance of IT, English and science teachers, in collaboration with the project coordinator, computer science teacher. Teamwork included developing skills and knowledge related to building and building LEGO Mindstorms robots, acquiring interdisciplinary knowledge, improving skills in using digital learning tools, critical thinking, problem solving, developing communication skills and the ability to cooperate, applying knowledge of science, technology, engineering and mathematics (STEM).

The students participated in a documentation visit to a Center - School of Robotics in Vilnius, a center for training students' skills and competencies in the fields of electronics, mechanics, engineering and programming. The activities carried out within this center were: presentation of 3D printed parts and two robots that will participate in a robotics competition abroad, watching a video about robotics competitions and the necessary preparations for such a competition, presentation of a device that verifies resistance a 3D printed article and a device that can measure the distance with an accuracy of 0.02 millimeters, the visit of a time capsule made by the students, where a role play was presented through which 4 players locked in this capsule (enclosure), by pressing some buttons and completing some logical puzzles, they had to manage to free themselves.

Another LTTA activity in Lithuania was the “Mathematics in English” workshop, where Kazys Karpauskas, a mathematics teacher, presented the CLIL method of teaching mathematics. He briefly described the objectives and tasks of a CLIL learning lesson, why these lessons are important for students who after graduating high school choose to go to universities abroad where they will study all subjects in English. Thus, the mathematical basics taught in English help students to study abroad, in technical faculties.

The teacher presented the lesson by using the CLIL method, the main terminology, the way students work, in pairs and groups, how they search for information on the Internet, create slides, videos, give presentations.

One of the papers developed by Lithuanian students was presented as a result of this teaching method entitled: "Angles". They were presented in Power Point: terminology, all types of angles and their names in English, and then a questionnaire was designed by Lithuanian students about geometric figures. The guests (students and teachers) participated in the test and answered questions. Participants who answered correctly received prizes in the form of sweets.

Next, the students continued to perform their work tasks, resulting in the programming of the robot movement, the fulfillment of the chosen missions and the preparation for the robot competition on Friday, in the RoboLabas center.

The coordinator of the host project team, IT teacher and robotics specialist Jolita Stankevičienė gave a lecture in the computer lab in front of all students and teachers in the project about the methods of teaching robotics at Panevėžio 5-oji gimnazija: objectives, online resources, information and materials didactics carried out during robotics seminars. Next, the teacher presented a practical lesson on how to learn to code if you don't have devices. The microbit.org website offers the possibility to encode micro: bit online. BBC micro: bit is a programmable micro-computer that can be used for all kinds of creations, from robots to musical instruments, the possibilities being endless. Then, the teacher gave an overview of the construction and programming of the various LEGO Mindstorm robots: the driving base and with color sensors, gyroscope, touch and ultrasonic. Construction instructions and program descriptions can be found at education.lego.com.

Subsequently, teaching material on 3D printing was presented.

All project partners received addresses where they can find online resources: https://play.gaminu.eu/course/index.php?categoryid=8 (open online courses) and https://svietimas.inre.lt/pradzia (3D modeling with Solidworks program for schools). All participants in the project were able to follow the 3D printer and observe the 3D printed articles.

All the methods and devices presented allow and inspire students to participate in the digital world, make teaching and learning easy, efficient and creative!

On the last day of LTT in Lithuania, the projects carried out by the students were evaluated and analyzed and the online questionnaires for evaluation were applied..

The teachers participated in the festivity dedicated to the celebration of the International Teacher's Day, where the Lithuanian students prepared an anniversary show.

At the end of the activity, the teams went to the Robotics Center of the municipality of Panavezys: RoboLabas where the competition took place between the 4 teams of students, who presented the robots built and programmed to perform a maximum of 4 missions and took place the certificates of participation and awards.

Every day, after finishing school activities, according to the established Agenda, the hosts organized leisure events: trips around the city, in Bisons' Park, visits to museums, cultural evenings where the hosts presented dances, songs and national games. Project participants were also introduced to the Panevėžio 5-oji gimnazija scout movement. The physics teacher and the scout leader presented the scout's mission, to contribute to the life of the community in building a better world, to strengthen the ability of young people to face challenges. The scouts of the host school presented practical activities in the school yard, how to live in nature: to build a tent, to make a fire, to cook a porridge, to make herbal tea.

The movement of researchers at Panevėžio 5-oji gimnazija has been going on for many years and has developed strong, responsible, patriotic and mature personalities.

All these activities offered students the opportunity to develop their skills and behavioral attitudes, thus contributing to their training as active citizens. Communication in English, time spent together, friendships that have connected have contributed to the success of this mobility.

All participating students completed Reflective Journals.

To assess the knowledge gained in mobility activities, students completed an online questionnaire.

In order to measure the degree of satisfaction regarding the quality of the activities carried out, the students answered an online feedback questionnaire.

The results of the LTT activity in Lithuania were:

- Certification of competencies acquired in mobility through Europass Certificates and participation certificates
- 6 LEGO robots programmed to complete 4 missions
- 3 PPT Presentationsdiversificarea metodelor de predare si invatare, a activitatilor extracurriculare

- transfer of knowledge and experiences
- development of digital and communication skills in English
- developing positive life attitudes
- development of orientation skills in a foreign country
- development of social and civic competencies
- increasing the prestige of the school and its internationalization

The results of the mobility activity in Lithuania were disseminated as follows::

- publishing an article in the local press from each partner country in the project
- publishing online and on local and national television in Lithuania, interviews and films to promote the project.
- publishing the project results on the project's facebook page, in the eTwinning virtual space and on the project website, made by the Turkish partner
- organizing the dissemination workshop within the Teachers' Council, after returning from mobility
- organizing the dissemination workshop with the students from the target group
- publishing in the online environment the documentary film and the PPT presentation with the mobility activities, made by each team of students from the strategic partnership.

The evaluation of the results of the LTT activity in Lithuania was done by:

- mobility activity report
- the analysis report of the students' Reflective Journals
- feedback, initial and summative questionnaires
- questionnaires measuring the achievement of the project objectives.

The exploitation of the project results was achieved by organizing workshops in which students from the target group, together with teachers from the disciplines of science: mathematics and physics, built a LEGO robot that they programmed to perform 2 missions, using the platform LEGO. MINSTORM. Made teaching materials that will be part of the database of open educational resources, thus achieving the 3 objectives of the project.

A demonstration lesson on ICT was held, with the theme "Building and programming a LEGO MINSTORMS EDUCATION EVE 3 robot" at the Dacia Technological High School Pitesti, Romania, during the normal teaching-learning-

assessment program, in which the knowledge of mathematics, physics, ICT and programming with applicability in real life.

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Prepared by the project coordinator,

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