3rd workshop – Games and tools for programming

On 9th and 10th of January 2019, the third GLAT workshop "Games and tools for programming" was held at the University of Rijeka, Department of Informatics. The workshop gathered focus group of junior grade teachers from primary schools in Rijeka who were introduced to the basic programming concepts and various games and tools that can be used for learning programming.

The main learning outcomes of this workshop were:

- describe principles of Inquiry Based Learning
- describe the elements and process of computational thinking
- recognise the basic programming concepts in examples of different didactic games
- find, analyse, and remix existing examples of didactic games
- create learning scenarios in order to develop innovative ideas for using games with elements of coding.

After the introductory greetings and the overview of the 2nd workshop follow-up activities, the main activities of the 3rd workshop were announced. The introductory part was followed by the lectures, demonstrations and practical work sessions attended by the teachers from the focus group.

In the first session, Daniela Tuparova (South-West University Neofit Rilski) and Jasminka Mezak (Faculty of Teacher Education) introduced participants to the concept of Inquiry Based Learning (IBL) and possibilities of using games for learning basic programming concepts (algorithm, sequence of instructions, conditional sentence, loop, and variable).

Through individual and group activities, teachers analysed examples of games and tools for learning programming like Run Marco!, Code.org, Blockly Games, and Scratch.

Irena Nančovska Šerbec (University of Ljubljana) held a presentation about learning programming with games and stories in the second session. She explained the concept of computational thinking and possibilities for its development with visual programming language Scratch. By using Scratch, students can program their own interactive stories, games, and animations.

Participants were given the task to find, analyse and compare different examples of games and digital stories in Scratch.

2nd workshop follow-up activities

Teachers from the focus group applied the acquired knowledge from the second GLAT workshop "PBL, online quizzes and logical tasks" to design their learning scenarios. The designed scenarios contain quizzes and logical tasks in order to encourage creativity, logical thinking, and problem-solving skills. Experts from partner organizations provided online mentoring within the e-course in the LMS MoD.

The teachers implemented the designed scenarios in classes with their students and shared their experiences in the LMS.

The outstanding three scenarios, translated into English are:

1. *Addition to 5,* Mathematics (1st grade).

2. *Months of the year,* Nature and Society (2nd grade).

3. *Spatial orientation,* Nature and Society (3rd grade).

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glat@inf.uniri.hr
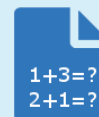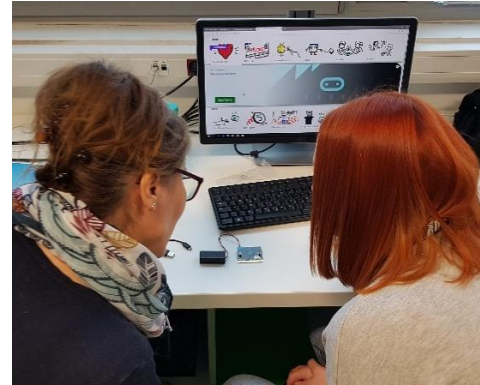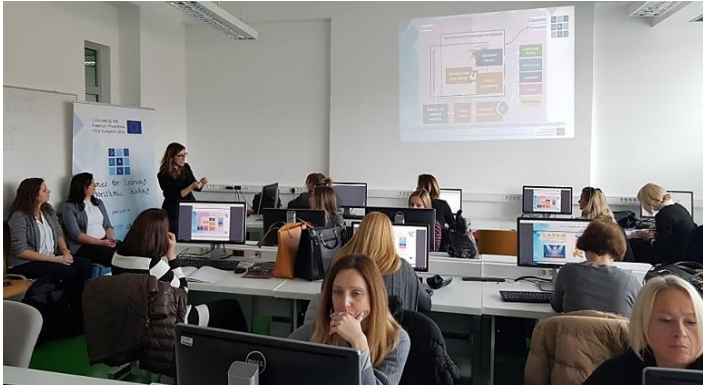
In the third session, Anja Luštek and Mateja Bevčič (University of Ljubljana) presented possibilities of the Scratch in more detail. Participants were first asked to test few previously prepared examples, then they were introduced to the basic principles of the way Scratch works (how to start, where and what are blocks, how to move them), and at the end of the session they were encouraged to change and remix existing Scratch projects to create their own stories.

During the second day of the workshop participants had a chance to learn how to apply micro:bit for encouraging algorithmic thinking. In the session led by Vladimir Trajkovik (Ss. Cyril and Methodius University in Skopje), the role of games in development of computational thinking was further explained and participants were introduced to the ways to incorporate technology and digital tools to engage their students. Afterwards, they explored the functionalities and features of micro:bit and its development environment as well as possibilities to apply this technology in different school subjects.

With the help of experts from project team, teachers started with creation of their game-based learning scenarios. They could use some of the existing games for encouraging algorithmic thinking or design a game or a story in Scratch with their students who will help to define the main elements of the game: the story, the goal of the game, the characters, the scenes, and logical tasks for directing the flow of the game.

At the end of the workshop, an evaluation was carried out. This was the last of the three workshops so, beside survey regarding the activities of the 3rd workshop, teachers participated in a survey about their expectations regarding the development of algorithmic thinking during GLAT workshops. The results will be compared with the matched survey conducted at the beginning of the 1st workshop.

The future project activities will include preparation and evaluation of the final enhanced version of syllabus with the learning materials and the best examples of learning scenarios as well as organization of a final video conference for dissemination of project's results.

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