FACULTY OF EDUCATION

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Projects at the Department of Informatics, Faculty of Education, CU

KEGA

Project name: Comprehensive innovation and educational support of the subjects of the study program " Informatics Teaching " with the integration of the issue of "Internet of Things"
Grant agency and project no.: KEGA 008KU-4/2020
Project duration: 2020-2022
Project leader for FE CU: doc. Ing. Igor Černák, PhD.

Annotation:

The basic goal of the project is to fundamentally innovate and modernize the current study program " Informatics Teaching " for the 1st and 2nd level of university studies based on content integration of "Internet of Things" across the entire program and with a close connection to creative use in practical life. The introduction of the "Internet of Things" issue into the teaching process is aimed at supporting students' creativity and analytical thinking, which will be reflected in the meaningful incorporation of new information into already acquired skills and habits in accordance with current development trends. At the same time, the study program will become more attractive, the profile will be improved and its graduates will be better applicable in practice in a difficult-to-predict future.

To support the achievement of this goal, the content of the project also includes the processing of:

- **educational support in the form of e-learning materials** - E-learning materials will be prepared for individual subjects of the innovated study program, which will serve to support teaching as well as for self-study and self-evaluation. This educational support will be intended not only for full-time and part-time study, but also for other forms of education that are implemented within the university (e.g. extended education for teachers from practice or specialization courses) or lifelong learning courses (for example at the University of the Third Age).

- **university textbook -** to improve education, a university textbook on the "Internet of Things" will be prepared and published, which would provide students and participants

in various courses with a basic comprehensive overview of theory and practical use in all areas of individual life and in the corporate or other social environment. The textbook will also cover this issue from a software and hardware point of view.

- **educational and methodological materials -** in accordance with the preparation of innovated subjects of the study program and the preparation of new ones, basic educational and methodological materials will be thought out and processed. The aim will be the closest possible connection of individual subjects, monitoring their continuity and common goal - the best possible understanding and mastery of this issue by students and course participants. In this area, the involvement of students in the processing of bachelor's, diploma, final theses or Student Scientific Activity competition theses is also expected.

- **a web portal to support the teaching of the "Internet of Things" in accordance with the innovated study program -** part of the project is also the creation of a web portal, which will be gradually filled with processed educational materials that will be accessible to students and teachers, or those interested in this issue. It is expected to be used as a communication portal for the exchange of experiences, dissemination of new knowledge, or solving problems of the "Internet of Things". It should also be a source of inspiration, software and hardware solutions. Participation in this project will be made possible by a wide community of teachers, students and other interested parties.

Project name: Implementation of new trends in informatics into the teaching of algorythmic thinking and programming in the subject of Informatics in secondary education.
Grant agency and project no.: KEGA 018UMB-4/2020
Project duration: 2020-2022
Project leader for FE CU: Ing. Jana Jacková, PhD. (responsible researcher of the cooperating workplace of FE CU)

Annotation:

The project is motivated by the knowledge that the students have biggest problems with algorythmic problem solving. This fact is supported by communication with computer science teachers and our survey, which we did in the previous period. This is also confirmed by analyzes and statistics from various programming competitions (e.g. iBobor) as well as the papers presented at the 25th Conference on Teaching Informatics DidInfo 2019. The project is focused on the development of algorythmic thinking of students in the teaching of Computer Science in secondary education in accordance with the innovated State educational program. The aim is to

create new teaching materials and teaching methodologies in the subject of Informatics, which in an appropriate way, develop algorythmic thinking, based on current and appropriately selected tasks, using computer programming and new programmable kits. The second goal is the creation of such materials and new methodologies that transform selected attractive tasks of the current state of knowledge in the field of informatics, artificial intelligence and robotics, etc. so that they are appropriate for secondary education. In the second goal, we will, using appropriately designed examples, create and verify models of artificial intelligence and robotics so that it is possible to assess what they can be used for and where their current boundaries are. The output of the project will be online methodological and teaching materials, available to all computer science teachers, seminars and workshops which, in addition to algorithmic thinking, will bring new modern topics and tasks to the subject of Informatics, such as cloudy, image recognition, robot tracking, obstacle avoidance, etc.