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CURRICULUM

Increasing The Competency of Computer Science Teaching Undergraduates On Coding Education

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Introduction

In the age that we live, technological developments are getting incredible speed. Today's children are born into technology and are heavily influenced by technological developments. In every information environment, which people are exposed to, the human brain is shaped together with the information coming from the stimuli in the environment and the schemas are based on these experiences. Therefore, the acquisition of "algorithmic thinking" starting from early ages and making it sustainable by further coding education is considered important for children to better understand the rapidly developing and changing world.

The understanding and learning of the specific language of the technology that is now confronted in every usage will also save the children from becoming a technology consumer and open their way to being a technology producer. More effective technology production and the quicker actualization of new ideas will contribute greatly to the development of countries. Today's children will be able to adapt to changing living conditions at an incredible rate tomorrow.

General Purpose

In this framework, a curriculum for coding education was prepared for the teaching practices of BIT / STEM undergraduate students studying at the partner universities in the EDUCODE project.

The purpose of this program is to raise the awareness of BIT /STEM undergraduate students who are studying in the partner universities about the topic, emphasize the importance of coding education, and to show how to deliver coding education effectively, how to use educational materials and tools and how to evaluate the gain levels in the delivered education. Therefore, practical studies will took part during the training and how to prepare the sample lesson plans will be shared with the undergraduate students.

Target Group of The Training

BIT/STEM Undergraduate Students

Unit 1	Acquisitions	Content	Teaching Methods	Teaching Materials	Evaluation Methods
Covers the 10% of the total duration allocated to the training activity.	1. Discuss the basic concepts underlying coding and programming education. 2. Explain the importance of computational thinking and problem solving. 3. Understand the critical role of ICT & STEM Teachers for the successful delivery of coding education. 4. Understand the importance of coding education in STEM	**The importance of Coding Education and ICT /STEM Teachers**	•	•	•
Unit 2	**Acquisitions**	**Content**	**Teaching Methods**	**Teaching Materials**	**Evaluation Methods**
Covers the 20% of the total duration allocated to the training activity.	1. Use the beneficial websites to teach coding more effectively. 2. Design graphical representation of algorithms via flow chart or class diagram. 3. Select appropriate motivational tools (CS unplugged, pedagogical games, algorithm visualization) to engage students in coding education. 4. Finding out the ways of how to collaborate with other people teaching coding. 5. Find high quality free e-textbooks and resources for coding. 6. Find specific video/movie/cartoon which can be used to in coding education in online platforms.	**Teaching Materials and Tools of Coding Education**	•	•	•

Unit 3	Acquisitions	Content	Teaching Methods	Teaching Materials	Evaluation Methods
Covers the 30% of the total duration allocated to the training activity.	1. Understand the importance of using various teaching strategies, methods and techniques. 2. Understand the advantages and limitations of teacher centered coding education. 3. Implement problem/project/game-based learning in coding. 4. Develop case studies, example problems/solutions etc. to use directly in teaching 5. Select the appropriate methods of how to engage students in the topic of coding.	**Teaching methods of Coding Education**	•	•	•

Unit 4	Acquisitions	Content	Teaching Methods	Teaching Materials	Evaluation Methods
Covers the 15% of the total duration allocated to the training activity.	1. Describe assessment methods for coding education. 2. Evaluate code and working examples of projects written by children. 3. Check plagiarism in the context of coding education. 4. Conduct a formative assessments as a continuous form of providing feedback to students 5. Use peer assessment in the context of coding. 6. Use different applications which can support assessment (e.g. Kahoot, Socrative and book widgets for instance).	**Assessment of Coding Education**	•	•	•

Unit 5	Acquisitions	Content	Teaching Methods	Teaching Materials	Evaluation Methods
Covers the 15% of the total duration allocated to the training activity.	1- Lesson Plan Development and adaptation 2- Lesson Learning outcomes 3- Time planning	**Design lessons plans for relevant coding topics**	•	•	•

Unit 6	Acquisitions	Content	Teaching Methods	Teaching Materials	Evaluation Methods
Covers the 10% of the total duration allocated to the training activity.	1. Know how to use and integrate coding into STEM, robotics and internet of things *a. Notice the working procedures of developing applications* 2. Know appropriate development tools for teaching coding (e.g. WowWee Elmoji, LEGO Boost Robotics Creative Toolbox, Primo Toys Cubetto, Microduino's mCookie, Microbit, etc.)	**Applied Coding**	•	•	•