

# Creating Personalized Online Courses based on Competencies and Open Educational Resources

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## Abstract

Digital technologies take over a central role in today's society and with that also in education. They enable new hybrid teaching and learning formats such as *blended learning*, full online environments such as *massive open online courses (MOOCs)*, or even *personalized open online courses (POOCs)*. The project *DigiFit4All* aims to generate individualized online courses in computer science and digital education based on competency models together with pre-testing the learners. For this purpose, a platform supporting the creation of online courses and enabling the automatic import into a learning management system is developed. In this workshop, the teachers' and learners' workflows are presented and can be tested on the platform by the participants.

## Keywords

personalized learning, online course, open educational resources, competencies.

## 1. Introduction

Digital technologies have a deep impact on today's society and with that also on education. Over the last years, the number of online teaching materials in the form of *massive open online courses (MOOCs)*, which offer courses on various topics, arose. *Personalized open online courses (POOCs)* are the next step to individual learning in online settings with customized content. The Austrian project *DigiFit4All* aims to generate POOCs for computer science and digital education for pupils, university students, teachers, and administrative staff, to support educators and lecturers. It is a four-year cooperative project of the *University of Klagenfurt*, the *Johannes Kepler University Linz*, the *University for Continuing Education Krems*, and the *Vienna University of Technology*, which started in May 2020.

For the purposes of the project, an online platform is developed, which is based on several components [1]. It supports the organization of competencies and competency models, the collection of learning resources in the form of *open educational resources (OER)*, pre- and post-tests for individualization and assessment, and the direct export to a learning management system. The *GECKO (Graph-based Environment for Competency and Knowledge-Item Organization - <https://gecko.aau.at>)* platform enables the organization of competencies and the connection to learning resources and test questions, which are also stored on the platform.

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Assessment and pre-tests are performed via *KAUA (Košice and Alpen-Adria University Assessment - <https://kaua.aau.at>)* [2], and a plugin regulates the import of learning material into a *Moodle (<https://moodle.org/>)* course.

After two years of development, the platform and the materials are prepared to start a pilot study in autumn 2022. In the workshop, the participants will be able to test the functionality of the platform and take a look at created resources. They learn how to operate the system, how it supports the creation of online courses, and how it can be used for their own purposes.

## 2. Creating Courses by Competency Selection

In the role of teachers or lecturers, the workshop participants can use the *GECKO* platform to follow the workflow for a course creation. After they defined a course, teachers select the first competency they want to reach in their course from a predefined pool of international competencies. As the system stores dependencies of the competencies as well [3], it suggests necessary foreknowledge in the form of competencies which should be reached before. Teachers decide if they want to add these suggestions to the course or not. Each of the competencies is connected to one or more learning resources prepared to reach the competency. So, as the next step, the teachers select the learning materials for their course. They repeat the steps until they have integrated all the competencies for their course. After that, the course can be imported into *Moodle*. Overall, the participants learn about a platform that can help them create their online courses.

## 3. Testing the Learning Resources

After the participants created their own courses, they change their role and become learners. They can enrol in their own courses and participate in a pre-test to find out which competencies they already have acquired. The test items are also connected to competencies and with that to the learning resources of the course. Following the results of the pre-test, the course only shows the material of those competencies the learner has not yet reached. In this role, the participants can take a look at the developed materials, which are mainly in German but will include translations or subtitles, and provide feedback.

## References

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