Zurich University
of Applied Sciences

zhaw

**School of
Engineering**

ICP Institute of
Computational Physics

Development of new features in the e-Exercises app with ASP.NET Blazor

Solving practice problems has a central role in studies. Especially in STEM subjects (mathematics, information technology, natural sciences and technology), this kind of learning is characteristic. If there were an online platform on which practice exercises could be solved and discussed, this would be more than an innovative alternative to the status quo. Using the advantages of digitalization in a course offers opportunities: gamification, learning at one's own pace, efficient evaluation of the results and ongoing feedback to continuously view the learning progress for students and lecturers. With e-Exercises, or eEx for short, this online platform is to be created.

In a previous project, a prototype of the e-Exercises app was developed to enrich the exercises in physics classes with elements from the gaming industry (gamification). The app distributes the exercises via an online platform, points are awarded for correct solutions and a help system supports the solving of the exercises, whereby each hint costs points. eEx was tested during six weeks in class and was well received by students and the teacher. Based on the lessons learned, the app was re-implemented in ASP.NET Blazor as a single page application.

Currently, key features for classroom use are missing. In this work, two of these features were implemented. The first innovation concerns the Multiple Choice question type, which allows single or multiple choice tasks to be set, scored and rewarded with points. For the second innovation, a graphical user interface for creating or editing questions was designed and partially implemented. For the new features, requirements were elicited using user stories and the architecture was designed. The implementation of the new functionality was done using ASP.NET Blazor model classes, extending context and service classes, and Blazor components. It was tested and iteratively refined in reviews.
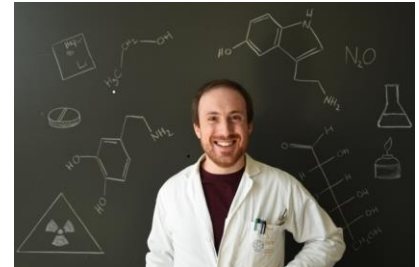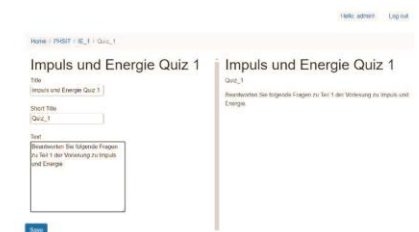
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Dozierende
Kurt Pernstich
Walter Eich
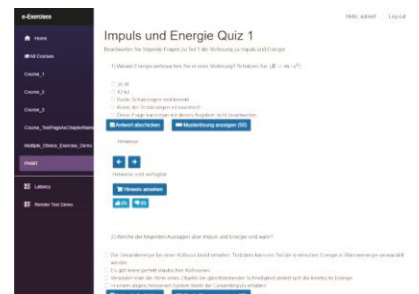
Single Choice and Multiple Choice exercises in eEx

An existing assignment is edited in eEx