

A web IDE for learning computer science languages

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Enki is a web integrated environment for learning computer science languages, such as programming languages or diagrammatic languages. This environment is one of the GUIs of Mooshak 2.0, the new version of Mooshak, a framework for automated assessment of computer science languages. Enki was designed for a wide range of use cases, from introductory high school or college courses, to massive online open courses. It assumes that the students may have little or no help from a teaching assistant and that they may not have the necessary tools installed on their computers. In fact, students may be accessing the Internet through a tablet rather than a computer, where these tools would be virtually impossible to install. In spite of these constraints, it aims to prepare students to the development environments typically used in computer, namely IDEs.

Enki can be described as an entry level IDE, a scaffolding to support the progress of students towards more complex environments and tools. It has simplified versions of common IDE tools, such as editors or launchers, and new tools required by a learning environment, such as a resource browser or a content recommender. Enki borrows from IDEs both the role of a tool integrator and the characteristic graphic user interface (GUI).

This web-based IDE that integrates several pedagogical tools designed to engage students in learning programming languages. It achieves this goal (1) by sequencing educational resources, either expository or evaluative, (2) by using gamification services to entice students to solve activities, (3) by promoting social interaction and (4) by helping students with activities, providing feedback on submitted solutions. The paper describes the system's main concepts and architecture, details its design and implementation. It also reports on use in several undergraduate courses, with different programming languages such as Java and C#, query languages such as SQL and diagrammatic languages such as Entity-Relationship.

