

Creating Effective Personalized Learning for STEM Skills: An Introduction to LON-CAPA for New Users

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Abstract:

This introductory workshop shows how to create meaningful math-based assessments that are individualized to students. Using LON-CAPA, instructors can create online problems with randomized variables, enabling students to discuss and learn from each other without copying. Students can be given instant feedback and hints, and can repeat problems as needed to develop competencies. In the first part of the workshop you will experience LON-CAPA from the student's perspective by completing practice problems and receiving hints and immediate feedback to aid in mastering course material. The 2nd part of the workshop will guide you through learning the LON-CAPA interface and programming some basic problem types, including multi-part numeric problems using randomized variables, significant figures, and required SI units. In part 3, the Learning Management System (LMS) functions of LON-CAPA will be explained, and you will learn how to organize and distribute content to students, as well as manage topics like assignment points and due dates. Part 4 will take a deeper dive into LON-CAPA's functionality, including complex number handling, proper rendering of symbolic math equations, dynamic plotting linked to randomized variables, formula responses linked to randomized variables, interactive plotting, and use of 3rd party math applications for actions like solving symbolic math equations. Finally, Part 5 will show how instructors can use the assessment analysis features of LON-CAPA to get an overview of student performance individually and in groups, and how faculty can use the feedback from assignments to adjust lectures to address observed student difficulties and to create new, more targeted problems. This is a 3-hour workshop, and attendees should have basic familiarity with programming fundamentals.