



E111 Using Online Learning and Gamification to Enhance Reasoning Skills

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Learning Overview: After attending this presentation, attendees will understand how and why a reasoning skill curriculum was created for forensic science students.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by highlighting the importance of improving reasoning skills for forensic science students by incorporating online learning and gamification.

The goal of this research was to enhance students' reasoning skills using online content and gameplay. Curriculum used in the online modules and the modified version of Clue® were created by a student and a professor. Student involvement in curriculum design allows students to modify content to their own predisposition. Allowing students to have a say in what they learn and how may create a more engaging environment for education, increasing the motivation of students to learn. As a student, taking on the role of creating content and assessments assisted in a deeper understanding of teaching pedagogy.

Using the Online Learning Initiative (OLI) environment, modules focused on improved reasoning skills in the sciences were developed. Modules were equipped with videos, definitions, and activities to provide diversified means to grasp the content. The modules combined with the game were implemented in a flipped-classroom setting where students completed the online modules, then applied their knowledge while playing the game. Flipped-classroom models consist of lectures, online learning, and other various learning interphases outside of the classroom. This enables students to apply their knowledge in the classroom where thinking errors can be corrected and automatic feedback is feasible and encourages educators to be more of a mentor than a teacher.

Students were asked to complete the online modules at their own pace within a week timeframe. The primary analysis compared pre-test versus post-test scores to assess students' knowledge gain. Next, a group of students played a modified card-based version of Clue®. Only some of these students had completed the online modules. Students were asked to play the game once without any further instruction. For the second game, students were asked to play again and complete a worksheet to track their thoughts and identify reasoning processes. Analysis of the game included a comparison of answers between those who completed the online modules and those who did not. This research demonstrates how online learning and gamification can enhance reasoning skills.

Results indicate that students are learning the different types and modes of reasoning through the online content. Additionally, students who have completed the online modules prior to playing the Clue® game were better able to identify their own reasoning processes while playing the game. Overall, this work provides an engaging format to teach reasoning skills to forensic science students. Furthermore, the interaction between an educator and a student enhances the design process and develops new skills for the student.

Education, Reasoning, Learning