C_3PO: Customizable Computer Coaches for Physics Online

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Problem-solving plays a crucial role in introductory physics. However, most introductory physics students are not skilled enough in problem-solving to use it effectively as a learning tool. These students need coaching to improve their problem-solving skills as they learn physics. In the past 30+ years at the University of Minnesota, integrating problem-solving in the classroom has shaped the pedagogy and structure of how the introductory physics courses. As part of the current curriculum, students are coached in solving physics problems by teaching assistants and instructors, primarily in the classroom. Computers are a potential tool to also provide this coaching since they are patient, non-threatening, and available 24/7 over the Internet. This talk will describe the underlying pedagogical models which are used to develop the online coaches and how they fit into the overall existing course structure. The utility and educational impact of the coaches as used in the first semester of large calculus-based physics at the University of Minnesota will be explored. Also, this talk will address how the results of this implementation are being used as input to the design of the second version of these coaches called C_3PO: Customizable Computer Coaches for Physics Online. This work was partially supported by NSF DUE-0715615 & 1226197.