October 25, 2013

Dear Nord Grant Committee members,

We propose to create an online, multi-player educational quiz game that can be used by all Case instructors. The purpose is to provide a student self-assessment tool that is more interactive and engaging than what is currently available. We request $3,500 to hire an undergraduate student for 8 weeks during Summer 2014.

BACKGROUND

Self-assessment can be a highly effective learning technique, provided that students are motivated to participate. An online quiz is a form of self-assessment that is interactive and can provide immediate feedback. Many web-based services exist that allow instructors to conveniently provide online quizzes. However, students may lack interest in a standard quiz as a pure study aid without additional reward. The significant popularity of multi-player online games suggests that a live quiz competition could be highly effective in motivating students to participate. We are aware of only one service that provides such a feature (http://socrative.com/). However it is only designed for live use in the classroom and cannot be used by students outside of class.

Previously we developed a basic self-assessment tool that does not have multi-player capabilities (see Fig. 1 and our working demo at http://tutor-neurocomp.rhcloud.com/). The intent of that project was to investigate alternatives to the typical question-and-answer format. For example, we incorporated an adaptive hint feature. The system was successfully tested as a pilot for a small class of 16 students with a very limited amount of course content. We have not attempted to use the system with subsequent classes due to the lack of personnel needed to develop additional course content. Our system is ideally suited for developing a multi-player competition because it already contains all of the primary components of an online quiz system.

GOALS

We propose to transform our previous system into a multi-player quiz game that can be used by all instructors at Case. Instructors will be able create their own quizzes, and students will be able to answer questions in a multi-player format that allows friendly competition (see Fig. 2). We will first evaluate the system with a large class of about 300 students before inviting other instructors to participate.
We expect two specific outcomes. First, we predict that a wide range of students will be motivated to use the system and thus benefit from the additional studying and self-assessment. Students can participate at their own pace non-competitively, or they can use the competition feature in small and large groups.

Second, we predict that instructors will be able to use statistical data on student performance to quickly and informally evaluate overall student comprehension levels. The quizzes can actually provide performance feedback sooner than graded assignments if the two are offered concurrently. We anticipate that the students’ experiences will give rise to ideas for other pedagogical features.

Three major tasks will be required to engineer a multi-player system that supports multiple courses: (1) The multi-player functionality will involve a major redesign of the previous system as well as testing; (2) a large number of quiz questions must be written in order for students to benefit throughout the length of the first course; and (3) the system must be expanded to support multiple courses and provide a convenient instructor interface.

To accomplish the three tasks above, an initial version will be created with educational content designed for a single course offered through the Case School of Engineering: ENGR 131, Introduction to Computer Programming. Professor Fietkiewicz has many years of experience teaching ENGR 131. Preliminary testing can be done at the end of Summer 2014 with a small class of about 20 students. A thorough evaluation of student participation can be done during Fall 2014 with a large class of about 300 students before opening the system to more Case instructors.

Please see the attached budget that discusses our request for $3,500 to hire an undergraduate student for 8 weeks during Summer 2014. We are grateful for the Committee’s consideration.

Sincerely,

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