### FY11 Innovations in Teaching with Technology Awards: Stage Manager Calling Simulator

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<tr>
<th>Proposal Title:</th>
<th>Stage Manager Calling Simulator</th>
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<td>Investigators:</td>
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<td>Department(s):</td>
<td>Theatre Arts</td>
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<td>Funding Awarded:</td>
<td>$25,000</td>
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In the performing arts, part of a stage manager's role is to verbally signal all lighting, sound, special effects, and stage automation sequences. On a normal theatrical production, a stage manager may verbally call 300-700 cues and trigger another 20-50 cues through a switchboard of signal lights.

It is very difficult to teach students how to successfully call a show due to the production and labor costs of a live performance. It also would be very dangerous to place an inexperienced student in the calling position due to the safety concerns of moving scenery and automation. So, much like the simulators that air traffic controllers use to train and to improve their focus and stamina, we would create a simulator for stage managers calling theatrical cues.

This simulator project would begin with a series of instructional videos on calling cues based on text, music, automation, and actor movement. These videos would go beyond classroom instruction in that we could use sequences from an actual production to show the outcome of rushed, late, and incorrect cuing. The simulator would increase in difficulty, starting with calling established cues from a prepared script and advancing to writing cues in a blank script based on data from lighting and sound designers. Students would also learn to call cues based on a musical score and standard dance cuing notations. The project would also include interviews with prominent stage managers from Broadway and large-scale extravaganzas such as Cirque du Soleil about advanced calling techniques.

The simulator consists of a video of a show recorded from the stage manager's booth. Using voice recognition software and a timeline synchronized to the video, the simulator would record whether cues were called successfully and deliver immediate feedback to the student. The feedback would be displayed as a series of colors on the frame of the video (e.g., green for a successfully called sequence, yellow for minor errors, red for missed cues or serious errors). If a student makes multiple mistakes,
they will also receive immediate audio feedback. One of the intended lessons of this teaching tool is for students to learn how to recover quickly after errors rather than miss additional cues while dwelling on previous mistakes. At the end of the lesson, the simulator would give more extensive feedback and allow the student to go back and practice sections that caused them difficulty. There is also a separate audio track of a professional stage manager calling the show so that students can follow along in their own scripts.

The goals of this simulator are to enable students to improve their calling stamina while remaining focused on possible disruptions to a given performance. We would record multiple performances and interweave sequences so that the simulator changes each time it is used. In a normal show, the performance time might vary by 2-4 minutes for each hour of performance. Mechanical problems are more prevalent than we would like, so this simulator would also offer students the chance to make immediate adjustments rather than rehearse to the same video recording. As students improve, we can increase difficulty by adding outside distractions or crew operating errors.

At present, the Stage Management program in Theatre Arts only offers training in calling shows at the graduate level and we need to limit enrollment in that course to 8 students due to the time-intensive nature of the training. The simulator would allow us to teach this critical aspect of stage management to undergraduates and to give all of our students the opportunity to call a greater range of performing arts productions.

The only course that currently addresses calling cues in detail is 049:200:001 Stage Management: Special Topics and it is only offered every other fall with a prerequisite course. So a MFA graduate student may not take this course until the last year of our three-year program. The students spend the ten weeks of the semester learning a 2-hour show and 90% of the class time during those weeks is spent by one student calling cues to a displayed video while all other students watch. While we offer undergraduate courses in stage management, we cannot offer cuing training due to class size and the need to cover other important course topics.

Learning how to call cues is much like learning to play a musical instrument. But with an instrument, students can go home or to a studio and practice. While we give videos to our students, they cannot determine whether they called a sequence successfully. It would be like learning to play an instrument without actually hearing what you played.

And while most students can call a minute or two of cues, it requires stamina to remain focused on all possible outcomes for an hour or more without a break. And though two hours of calling practice is certainly helpful, this simulator would allow us to offer our students 6-10 hours of shows to practice and to learn alternative methods of recording cues in their scripts.
How will it improve student learning?

Through a request to the Center for Teaching, graduate student Lisa Johnson has been researching the impact of simulators on student learning. This proposed simulator would provide experiential learning, which Hoover and Whitehead describe as occurring when a personally responsible participant cognitively, affectively, and behaviorally processes knowledge, skills, and/or attitudes in a learning situation characterized by a high level of active involvement. The feedback and variety of problem-solving opportunities would also follow the three components of Kolb’s Process-of-Learning Model: experience, reflection, and active experimentation to test student concepts.

Rather than watch other students work for 2 hours before having 20 minutes of instructor time (in front of the entire class), each student could work at a simulator on different projects while the instructor gives additional feedback throughout the classroom. For the undergraduate course of eighteen students, the instructor can demonstrate techniques and then send students home to practice. In fact, an instructor could use this simulator to assess student growth through the entire practice period.

We can assess the impact of this teaching tool based on previous offerings of the course and current student feedback. We would first measure how much material can be addressed effectively: if we were able to teach 2 hours of calling exercises with an average student grade of X on final exams, can we increase the amount of material while maintaining student proficiency? We can also teach one sequence using the old method and another sequence using the simulator and measure how much more quickly the students were able to master the material. We would also conduct surveys of the students engagement and satisfaction with the simulator.

While this simulator would be used primarily in stage management courses in theatre, it could also be used in dance and opera. In addition, we could offer this simulation to introductory courses in theatre so that all students can experience what it would be like to call a full live production. We would also make this simulator available to other colleges and universities, many of which do not offer any coursework in stage management even though they have students perform as stage managers on productions. This simulator and its accompanying videos would offer a series of best practices to students who would not have any other opportunity to learn how to call cues before walking into their first technical rehearsal.

We have access to the performance content for the simulator. Our prototype will be based on recordings of the 2010 UI Dance Gala and the 2011 New Play Festival. If we eventually sell this simulator to other schools/users, we would like to offer nominal fees to all artists involved in these recordings.
I met with Jason Bridenstine and Nathan Sams at Budcat Creations, a subsidiary of ATVI that has helped program the popular Guitar Hero line of simulator-games. They provided the following estimates if they were create this simulator:

- Voice Recognition (limited vocabulary recognition of 10 words + numbers + letters): 3-4 weeks
- Client/Server relationship: 2-3 weeks
- Video Display: 1 week
- Feedback frame with timer: 1-2 weeks
- Keystroke Recognition for Cue Lights: 1 day
- Post-Simulation Assessment Screen: 2-3 weeks

Total: 2-3 engineers for 3-4 months. Potentially an artist for pre/post screens and the frame.

In its present design, the simulator would be offered as downloadable content for a desktop/laptop with a server connection for feedback and assessment. We would also experiment with using a fully integrated system such as an iPad since it would streamline the microphone use and system settings. In addition, if we offered the simulator through a portal such as iTunes, we would resolve many distribution challenges and have the ability to send users new content to prolong the usefulness of this simulator.

I am allocating $2,000 from my personal research account from the First Year Seminar program to begin work on the prototype of this simulator. The Department of Theatre Arts has dedicated an additional $1,000 towards the creation of the simulator.

In addition to the ITTA, I will be applying for funding from the UI Enterprise and the New Venture Challenge from the Pappajohn Entrepreneurial Center.

Ideally, I would like to draw upon the expertise of the ITS-Instructional Services staff for much of the project and to hire an outside firm such as Budcat Creations for specific elements. For instance, it appears that our ITS staff have minimal experience with voice recognition software, so it might be most cost effective to hire an outside engineer for that component.

Year 1: $25,000
- Phase 1a: Overall simulation design in initial implementation with user input via keystroke.
- Phase 1a Costs: $10,000/ITS-Instructional App Developer
- Phase 1b: Voice recognition and user assessment/feedback.
- Phase 2b Costs: $15,000/Budcat Creations or similar software design company

Year 2: $17,000
<table>
<thead>
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<th>Rough estimate of costs</th>
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<tr>
<td>• Phase 2a: Implementation in Fall 2012 graduate and undergraduate classes</td>
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<td>• Phase 2a Costs: $2,000/ITS Support for classroom implementation/adjustments for initial roll-out to 25 students</td>
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<td>• Phase 2b: Client/Server, Distribution through online service such as iTunes, additional content*, potential distribution through a self-contained system such as the iPad.</td>
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<td>• Phase 2b Costs: $15,000/ITS</td>
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* Both Cirque du Soleil and the Blue Man Group have expressed interest in this project. Both performance groups may allow their productions to be used for simulator content if the prototype meets their quality standards.

I will need to secure video equipment to record the performances but I am beginning discussions with the Dance Department’s videographer and UITV for recording services. The interviews with prominent stage managers would be paid for separately from this award.

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