



**GAMES, LEARNING & SOCIETY CONFERENCE:
JUNE 23-24, 2005—MADISON, WI
PROPOSAL SUBMISSION TEMPLATE**

1. Proposed session format (exhibit, symposium, discussion, etc.): Individual Presentation
2. Title of proposed session: Learning through Game Modding
3. Abstract (please follow instructions as outlined in session format descriptions. For symposia, please include each separate abstract and title):

Statement of Interest

Some researchers have suggested that designing and implementing games can lead to deeper forms of learning than simply playing games created by others. Learner design efforts may benefit from the increasing number of computational engines that allow users to customize and expand game behaviors. We seek to understand how modifying, or *modding*, existing games can lead to various forms of learning.

Background

Game design can be a powerful motivator for learning complex skills. For instance, studies of elementary school children who designed educational games suggested that programming could be a medium for personal and creative expression as well as helping learners develop informal notions of mathematical and computational formalisms (Harel, 1991; Kafai, 1994). Learning by designing provides opportunities to engage in rich problem solving activities that resemble those of expert game designers.

Unfortunately, designing and implementing games is a daunting task. Building games with high-level computer languages requires a great deal of work unrelated to game play, and simpler authoring tools often fail to provide the realism that learners see in modern video games. Fortunately, designers began abstracting their games from the underlying engines that handle graphical rendering, camera control, lighting and so. These engines allow games to be modified, and communities of players now routinely alter and share *modded* games with others. Modding also involves some degree of learning, but the overhead of tweaking these game engines is significantly less than other options, especially if the goal is to produce products that resemble current, commercial games. More so, we believe that modding can lead to opportunities to learn by designing.

Presentation

Our session will describe the types of learning that can occur while modding games, e.g., computer programming, mathematics, physics, artificial intelligence, and software engineering. We will present these ideas through case studies of high school and college students' modding in classroom settings and qualitative analyses of what they learned by creating working demonstrations of video games. We will focus on the curricular activities designed to ease the complexity of modding game engines and discuss difficulties that emerged during the courses. Student comments on the degree of effort required to work with different game engines will also be presented, as those have helped us to understand how to design modding exercises that promote learning of various domain skills. In the end, we hope to promote a new direction for research, in particular promote the research in the design and development of tools that can emphasize learning by modding.

References

- Harel, I. (1991). *Children designers: Interdisciplinary constructions for learning and knowing mathematics in a computer-rich school*. Norwood, NJ: Ablex Publishing.
- Kafai, Y. B. (1994). *Minds in play: Computer game design as a context for children's learning*. Mahwah, NJ: Lawrence Erlbaum Associates.

Participants

Magy Seif El-Nasr, Assistant Professor, The Pennsylvania State University, School of Information Sciences & Technology, magy@ist.psu.edu.

Magy Seif El-Nasr is an assistant professor of Information Sciences & Technology at PSU. Her research explores the computational design of interactive, immersive experiences.

Brian K Smith, Associate Professor, The Pennsylvania State University, School of Information Sciences & Technology + College of Education, bsmith@ist.psu.edu, 814 863 0012.

Brian K Smith is an associate professor of Information Sciences & Technology and Education at PSU. His research focuses on enhancing everyday learning and performance with computational tools.

4. Additional materials. If consideration of your proposed session requires the GLS Conference Program Committee to review additional materials (e.g. slides, video, images, etc.), please list them here and include them with this email attachment or provide us with a URL to their online location:

N/A

5. *"I am aware that adherence to copyright laws and standards for the use of copyrighted materials is my responsibility."*

Please specify by typing "YES" and your name: YES. Brian K Smith