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Designing Educational Games For Early Learners

Competing and Complementary Perspectives of Developers, Researchers, and Learning Experts

Naomi Hupert (Education Development Center), Jillian Orr (WGBH), Camellia Sanford (Rockman et al), & Phil Vahey (SRI Education)

Abstract

This panel includes experts in digital game development, research, child development, and the learning sciences. Together they represent the various stakeholders in the development of games to support and promote learning in early childhood. They will discuss and debate their unique perspectives with respect to the goals and design of educational games as well as the ways their perspectives work in combination and in opposition to each other. For example, game developers often prioritize engagement and the fun features of a game that make children want to continue playing, while a researcher might prioritize the ways we know that young children use technology and the features that are associated with learning outcomes, and a child development expert might highlight the need for developmental appropriateness in content and usability. Thus, they all want the game to motivate and engage, but the way and extent to which learning is prioritized might differ.

Digital Games for Learning in Early Childhood

Recent research suggests that technology and media, when used in developmentally appropriate ways, has unique affordances for improving STEM learning in early childhood (e.g., Clements & Sarama, 2008; Linebarger & Piotrowski, 2009; Neuman, Newman, & Dwyer, 2010; Penuel et al., 2011). However, despite these documented affordances, integration of technology and media in early childhood classrooms is not common, partly due to concerns about the effects of screen time on young children's cognitive and social development. These concerns certainly contain some merit, but those voicing these concerns often lack information about how media, and especially digital games, are being developed with educational purposes at the core and with interactive and non-digital components integrated into the game play. They may also lack ways of differentiating between effective and non-effective digital educational games. This panel will address these concerns, drawing out the unique ways that various stakeholders engage in the design and development of games and the affordances and concerns they see with the use of such games in early childhood settings.

Panelists will provide examples from their own work with digital resources for young learners that spur and support rich social interactions and complement effective, established teaching practices for preschool children involving hands-on experiences (NAEYC, 2011). They will discuss the collaborative and, at times, challenging process of creating and evaluating such resources while managing the

competing interests of partners. Participants will also hear the various perspectives of the panelists on how to structure a game for intentional scaffolding and opportunities for children to learn at their own pace, how to track individualized pathways through content, and how to provide essential information for teachers to better understand the skill level of individual children and thereby inform instruction. Finally, they will hear ideas about what makes a usable interface for young children, for example encouraging focused task completion as opposed to overstimulation or potential distraction onscreen and also providing moments for reflection, thought, and learning.

Session Format

Panelists will begin by introducing themselves and their areas of expertise, highlighting their general approach to the design, evaluation, and/or use of educational games geared towards young children. Then targeted questions will be used to generate discussion and debate. Audience participation will be encouraged and there will be ample opportunity for audience members to pose questions to the panelists. Sample questions that will guide the conversation include:

- What makes a digital game educational?
- What do you see as the primary goal of educational games?
- What are features of digital games that are developmentally appropriate? How do these features relate to learning?
- How do you envision digital games being used in early childhood classrooms?
- How do you envision digital games being used in informal early childhood and family settings?
- How do digital games support, complement, and/or supplement traditional learning in early childhood?

The Panelists

Panelists hold expertise in digital game design, educational research and evaluation, child development, and the learning sciences.

Naomi Hupert, MS.Ed.is a Research Scientist at the Education Development Center's Center for Children and Technology. Her work addresses the supports required to provide all students with engaging and challenging academic instruction. This work has incorporated technology as a valuable tool and includes research, development, and evaluation of programs that make use of technology to support teachers, children, and families. Her current work includes formative and summative evaluations of digital media designed to support early learning in literacy, science, and mathematics, and examines best practices for integrating digital media into formal and informal learning settings.

Jillian Orr, Ed.M., is the Executive Producer at WGBH Educational Foundation in the Children's Media Group. She has led the development of digital assets on several NSF-funded projects, such as Next Generation Preschool Math (NGPM) and Next Generation Preschool Science (NGPS), and has developed educational games for PBS television shows like Curious George and Arthur. Her expertise lies in producing digital educational resources and games for children, and supporting materials for

teachers and parents, through a participatory design production model. She has also written, tested, and refined algorithms for gameplay progress reporting.

Dr. Camellia Sanford is a Senior Researcher at Rockman et al. She has extensive experience conducting evaluations of educational and program impact within informal settings such as museums, homes, and the web. She then uses these findings to support partners in making design decisions. She leads several media-related projects that include television, online games, and app components and has written several articles on family learning in informal environments, exploring how measures such as time spent, engagement, and content conversations are used in these settings.

Dr. Philip Vahey is the Director of Math Learning Systems at SRI. Dr. Vahey has an established track record in leading design efforts that integrate technology into pre-K–12 mathematics education. He is currently the co-PI of the Next Generation Preschool Math project, a DRK–12 grant to develop and test a digitally enhanced preschool math curricular supplement, and leads the Cornerstone Mathematics and SunBay Mathematics programs, which are integrating Web-based resources into middle-school mathematics classes in England and Florida.

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