Chapter LXXI
Children as Critics of Educational Computer Games Designed by Other Children

Lloyd P. Rieber
The University of Georgia, Athens, USA

Joan M. Davis
The University of Washington, USA

Michael J. Matzko
Independent Consultant, USA

Michael M. Grant
The University of Memphis, USA

ABSTRACT

*We have long worked collaboratively with middle school students to help them design their own educational computer games. An interesting question has emerged from this work: Do students, **other than those who do the designing**, find the games to be motivating? We gave a classroom of middle school students the opportunity to play educational games created by other middle school students. These students' opinions of the games were studied and compared to their actual play behavior. This study also explored the reasons behind the children's play behaviors and critiques through interviews. Important game characteristics identified by the children included the following: (1) storyline or context; (2) challenge; and (3) competitive affordances, especially those that promoted social interaction. Interestingly, two game characteristics touted in the literature were **not** found to be important to these children: (1) integration of a game's storyline and educational content; and (2) a game's production values.*

INTRODUCTION

Electronic gaming has become an integral part of the everyday lives of children, and they devote much time to gaming activities (Gee, 2003; Prensky, 2001, 2006; Provenzo, 1991; Turkle, 1995). Children also spend tremendous amounts of time in school. Unfortunately, children often find schoolwork uninteresting and disconnected from their lives. Student motivation continues to be one of the most difficult aspects of teaching (Ames, 1992; Ruenzel, 2000). We have long wondered if there is a way to merge the natural interests of children outside of school with the demands placed on them inside school.

One effort to do so is Project KID DESIGNER, in which elementary and middle school children have been given the opportunity and support to design their own computer games to teach classroom content (Noah, Nolan, Sharma, Matzko, Bourdeau, & Rieber, 1999; Rieber, Luke, & Smith, 1998a; Rieber et al., 1998b). While schools have typically resorted to extrinsic motivating factors, including reward systems, praise, and punishments, Project KID DESIGNER has relied on the students' intrinsic motivation based on their personal goals, objectives, and curiosities. Project KID DESIGNER has also freed the children from external criteria for how their products would be judged. Instead, the children generated their own criteria, though negotiated in design teams, for what makes a superior game.

The historical and philosophical roots of Project KID DESIGNER are founded on principles closely associated with constructionism (Harel & Papert, 1991; Kafai & Resnick, 1996; Papert, 1991; Rieber, 1996; Rieber, Smith, & Noah, 1998c). Consequently, the focus of Project KID DESIGNER has been on the role of the "child as designer" of computer games. Project-based approaches typically have students design and build working prototypes or other artifacts which represent, at least in part, their understanding of the content on which the design is based. Learning from these approaches comes from ways students must translate their understanding of the content into a design that can be shared in a public forum. Such a design process also helps students to see where gaps or inconsistencies exist in their understanding. In our previous research, we have used a research methodology best known as design research (Brown, 1992; Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Edelson, 2002). With this methodology, "the researcher sets a pedagogical goal and finds out what it takes in terms of materials, organization, or changes in the technology to reach the goal" (Newman, 1990, p. 10). Among the advantages of using design research are that it provides a useful perspective for theory development and it produces results that are directly relevant to the improvement of school curricula (Edelson, 2002).

Some of the most powerful examples of project-based learning are when students work collaboratively in design teams. A good example is a study by Kafai and Ching (2001) in which elementary school students developed computer projects in teams about neuroscience. Kafai and Ching found the team-based project approach afforded many unique opportunities for discussions about science *during* the design process. Planning meetings gave students an authentic context to engage in systemic discussions about science. Team members who had prior experience in the team project approach often extended these discussions to consider deeper relationships.

A key assumption in all project-based approaches is that the students will find the project authentic and relevant (Blumenfeld, Soloway, Marx, Krajcik, Guzdial, & Palinscar, 1991). One way to determine this is to look at what children do with computers when given the freedom to choose. As Papert notes, a good computer project "must have roots in the culture of children; it must feel to a kid like it is connected with the kinds of things that kids do, and in particular with the kinds of things that kids do with computers" (1996, p. 114). Papert contends that the two best