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Biology and Games: Changing the Medium to Maximize Learning

By Mark Szymanski <marks@pacificu.edu>

“School isn’t a game” teachers bark at their students when they become bored with traditional instruction: teachers talk and students listen. Before books lecturing and listening were the preferred method of teaching. Thus, teachers controlled the medium and the message.

Guttenberg changed this by building the first printing press. At that moment, teachers and religious leaders controlled the message but lost their grip on the medium. Once the print medium was developed, the dominant institutions of European culture, the church and governments, had to share the medium with other institutions and voices. History teaches us that as soon as control of a medium is distributed, a diversity of messages follows. So, educators should take heed and look back at this phenomenon, for we are in the midst of another medium shift. Visual and Audio media are gradually morphing with a number of distribution mediums, cable television, the internet, and wireless to create a fundamentally different medium.

School is a game; and students have become very adept at figuring out the rules of the game and creating strategies to succeed at the game of school. If tests and grades are important to students, they figure out how to get good grades; they learn test taking strategies; they learn what the teachers want from them; they lobby teachers for extra points. In short, they learn the patterns in the system and develop strategies to effectively and efficiently succeed. It’s learning at it’s best. It’s having a goal, taking inventory of your environment, and acting. It’s the natural process of learning.

“They can’t focus”; “they don’t stay interested”; “they aren’t on task.” These are familiar educator complaints. So, this begs the question: Why do teachers make these comments. One could argue that what they are experiencing is a mismatch of mediums and learning philosophies. Students are increasingly savvy at using and preferring new mediums for information delivery and interaction. The majority of our students are growing up in a digital world. They are coming to school having learned from television, video games, and the computer. Granted some
of these mediums are passive, but they are becoming increasingly interactive.

Why do students like games? Psychologically, they are drawn to games for a number of reasons. They meet our natural learning needs. In games there are clear goals, and as our skills increase, the challenges increase in parallel. This balance of skill and challenge is pleasing to the learner.

Csikszentmihalyi (1990) refers this as flow—a natural state we desire in a learning environment. In all activities there is a balance of challenge and skill. If a student complains they are bored, flow theory would argue that the student’s skill level exceeds the challenge. If a student complains that they are anxious and overwhelmed with a challenge, flow theory would argue that the challenge exceeds the skill level.

For example, the precocious second grader is bored by writing activities that require him or her to spell words he already knows. So successive 100% scores on spelling tests may please the teacher and parents, but secretly leave the child bored and daydreaming about video games.

In addition, it’s satisfying to figure out the strategies that allow skill improvement and thus increased challenges. Kids often share strategies for how to improve their scores and performance in a range of games.

Biology plays a role in kids attraction to games. Biologically, our eyes are drawn to movement, and our auditory systems are attuned to pick up and pay attention to a range of sounds. When a visual or auditory element in our environment is constant we attune to the stimulus, and often times, in a learning situation, boredom sets in (Zull, 2002). It’s how we are wired. In short, games satisfy our natural learning needs. Another characteristic of

So, Psychology and Biology are telling us that school as a game may be a useful metaphor to follow. The next question: Who is helping to make school more like a game? The answer: The Biology teachers.

As with most technological learning advances in schools, Science has traditionally led the way in adapting technology tools. The science teachers themselves are probably more comfortable with technology since they have been using technology as a standard tool in the classroom in lab situations.

Currently, some educators are beginning to create curriculum based on the game metaphor. A group of University of California professors have started a project that brings the sound Psychology and Biology theories of games into school.

The project is called Integrating Reflection and Immersive Learning in Science Education (3). A number of University of California Institutions are involved and are led by Barry Sinervo of UC Santa Cruz. The goal of the project is to develop multimedia content that is aligned with the course objectives and to provide the UC faculty with interactive educational content. At it’s
foundation is the assumption that emphasizing the natural way we learn with the new tools.

To accomplish this goal, the group has received funding to integrate two inquiry and technology-based science curriculums that have been developed over the past few years and used in K-12 and undergraduate settings. The two curriculums are WISE -Web-based Inquiry Science Environment (3) and Biogames—which focuses on role-play and games for science education (4).

“The WISE learning environment is built on research that explores (a) how to design science curriculum that helps students achieve a deep understanding of the dynamic nature of science, and (b) how computer technology can scaffold students as they perform such activities.” (3).

“BioGames (4) develops role-play simulation games that allow students to assume the role of an animal in an ecosystem. Through exploration of a simulation environment students gain an understanding of behavior, and the scientific method that scientists use in collecting data” (3). Biogames has developed a complete simulation environment that facilitates a high-level of interactivity, comparable to commercial video games.

In summary: We are in the midst of a revolution that is pushing educators to think differently about learning. Our tools are changing and our kids are giving us clues to what makes them tick. We just have to pay attention and challenge our old factory models of learning. Watch kids. They play games. Just watch the playgrounds, even playgrounds without fancy toys. When there are no rules, kids create them. When there are games, kids develop strategies for success. They share these strategies with other kids. Educators don’t have to master the games and the technology like the kids, they just have to understand why it works. Take a moment to watch and listen to kids. They are the key to helping educators improve instruction.

References


(3) http://www.uctltc.org/toolbox/funding/2001.02/awards.html#science

(4) http://www.biogames.com

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on February 4, 2014 at 9:04 AM said:

An outstanding share! I’ve just forwarded this onto a coworker who has been conducting a little homework on this. And he in fact ordered me lunch because I discovered it for him… lol. So allow me to reword this….
Thanks for the meal!! But yeah, thank you for spending some time to discuss this topic here on your internet site.

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on February 4, 2014 at 8:05 PM said:

I constantly spent my half an hour to read this web site’s articles everyday along with a mug of coffee.

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on February 5, 2014 at 4:19 PM said:

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Ministry Together
on February 6, 2014 at 12:52 AM said:

Thankfulness to my father who informed me concerning this blog, this blog is actually awesome.

Fallon
on February 6, 2014 at 1:26 AM said:

Greetings! I know this is kinda off topic but I was wondering if you knew where I could locate a captcha plugin for my comment form? I’m using the same blog platform as yours and I’m having difficulty finding one? Thanks a lot!

Jeffrey
on February 6, 2014 at 3:53 AM said:

Write more, thats all I have to say. Literally, it seems as though you relied on the video to make your point. You obviously know what you’re talking about, why waste your intelligence on just posting videos to your eblog when you could be giving us something enlightening to read?