Game-Based Learning: The Promise

SUSAN BROOKS-YOUNG

What do the U.S. military, medical schools, and Hilton Garden Inns have in common? They all regularly use game-based learning for training purposes. The time is now ripe for educational institutions to take a page from the public and private sectors. For two consecutive years, the authors of the *Horizon Report K-12 Edition* have identified game-based learning as one of the top education technology trends to watch. This shouldn't come as a surprise. A majority of K-12 students believe that digital gaming is an effective way to learn content and would like to have more opportunities to play online games in class. And increasing numbers of educators around the country indicate they are willing to explore ways computer and video games can be used to facilitate learning.

This isn't to say that games don't already have a presence in education; they've been a classroom staple for Friday afternoons and rainy days for years. They're used in learning centers or as sponge activities to help students focus on the topic of a lesson. In addition, students in upper elementary, middle, and high school grades are often provided opportunities to engage in simulation games that take several hours to complete. What's different is the notion that game-based learning could be used not just to reinforce skills or content understanding, but as a vehicle for learning the material to begin with.

Do Games Support Learning?

Think for a moment about the attributes of any popular game. To withstand the test of time, a game must

- have a clear objective;
- offer some form of structure through rules of play;
- build on increasingly difficult challenges;
- deliver an engaging sequence that keeps players involved;
- permit learning through experimentation; and
- provide immediate feedback.

Sounds a lot like a well-designed lesson plan, doesn't it? Gaming also provides environments in which players develop skills in the areas of teamwork, communication, and problem solving—all behaviors educators recognize as critical life skills. Andrew Hsu, founder of Airy Labs (airylabs.com) which develops social learning games for kids, says, "Games are an all-purpose medium. They can teach almost anything—math, language, economics, leadership, manners… anything. The best games are those that are easy to pick up but hard to master."

What Kinds of Games?

Experts have written thousands of pages discussing what constitutes an educational game. For simplicity's sake, I'll begin with an explanation provided in the *Horizon Report 2011 K-12 Edition* (bit.ly/pTjCQD). The set of all games ranges from traditional paper/pencil, card, and board games to multifaceted MMO games (massively multiplayer online) where large numbers of players interact with one another online. Games can be grouped into three broad categories.

The first type is games that are not digital. Today's most common education games fall into this category and typically are used to provide practice in applying newly acquired skills or knowledge. The second type is games that are digital but that do not support collaboration. The third type consists of collaborative digital games. Both kinds of digital games are played using some type of hardware such as a computer, game console, or mobile device (e.g., cell phone or tablet). Digital games may be software- or app-based, or accessed using an online interface.

What differentiates consumer games from those designed for education is the underlying purpose of the game. The primary purpose of consumer games is usually to learn strategies for playing the game itself. In the case of educational games, focus is expanded to include both mastery of the skills required to play the game and the content presented during the game. There's even a Serious Games initiative (seriousgames.org) that promotes the blending of significant content with play.

Levels of Complexity

Games can reinforce content knowledge without requiring much in the way of problem solving or higher-order thinking skills. This means that another area to consider when exploring ways to use educational games with students is the level of complexity of each game. Experts generally group digital and offline games into two categories when talking about complexity. They have various names for these categories, but here they will be referred to as being either simple or complex. What's the difference?

Simple games can be digital or offline. They may be played in 60 minutes or less and usually focus on one basic topic. A simple game can offer multiple levels of play, but all levels retain their emphasis on the original rudimentary concept. Due to their intricate nature, complex games are usually in some type of digital format. They require much more time to play—at least 10 hours, but often as much as 100 hours or more. Complex games also include multiple levels of play, but in these cases players are required to master complicated challenges before moving from one level to the next. Players of complex games learn various skills during the game and often are required to participate as members of a team rather than individually.

This explanation helps educators understand one of the fundamental reasons why classroom use of games has remained limited, even as more interesting and complex games have been developed over the last decade. Yes, there are issues related to whether the school's infrastructure can support more than minimal gaming, questions related to the value of learning through play, and the need to ensure that games have a direct tie to the curriculum. But one of the greatest obstacles to implementation of effective game-based learning is the fact that use of complex games requires so much time.

Laying the Groundwork for Instructional Use

It will be a while before education institutions fully embrace use of complex games in creating learning environments. In the meantime, there are steps teachers can take to make certain that any classroom gaming experience is designed to make the best possible use of students' time. Here are several suggestions.

- **Start small**—While it may be tempting to jump into game-based learning with both feet, take time to plan. Think about the attributes of simple and complex games. Consider how both types of games could be used in your current situation. There is nothing inherently wrong with using simple games. What's important is recognizing them for what they are and using them accordingly. Teachers of grades pre-K to four will probably spend more time using simple games, while teachers of older students will likely be able to plan for using a mix of the two types. Select educational games that are aligned with the curriculum, offer multiple levels of play, and that will engage students over time.
- **Work with a partner**—It takes time to learn about and try out various gaming devices and games. One person working on his or her own may end up on game overload; but two or more people can make it a group effort, also gaining the added benefit of collaborating with one another to share resources, discuss ideas, and develop shared activities. Another option is to reach out to other educators by joining an online community like the Software & Information Industry Association's free Game-Based Learning Community (edweb.net/gaming).
- **Establish expectations**—The importance of planning how game-based learning activities will operate in the classroom cannot be overemphasized. Teachers must think through both basic management strategies and requirements for student behavior while gaming. For example, how will gaming teams be determined? Are there strategies students will be expected to try out while gaming? If so, how will these strategies be explained or modeled? How will game-based learning be assessed? It's not possible to anticipate every possible snag, but working through as many potential pitfalls as possible will go a long way toward ensuring success.

Tips for Planning

- **Using simple games**—Remember that simple games require anywhere from a few minutes to one hour to complete. Although their focus is narrow, they can easily be used to reinforce content and for skills practice. Because they require little time, some of these games can be used to give children a quick break. Multi-level simple games can be used to provide more practice during class or even to extend the school day if children have access to the appropriate technology away from school.

  Kevin Jarrett is Technology Facilitator for grades K-4 at Northfield Elementary School in Northfield, NJ. He often uses simple games to help youngsters learn and practice basic skills—in fact, the technology strand of New Jersey's Core Curriculum Content Standards actually addresses gaming skills and primary-aged students. Jarrett maintains an *Only 2 Clicks* site so students and parents can access these games at home for additional skill building. Visit his site at bit.ly/pq0l5b.
- **Using complex games**—Simulations are a format familiar to many educators and often fall into the

Continued on page 14