Games for Learning

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Every prospective or new teacher soon faces two salient facts about our schools: all sorts of people criticize them (far fewer praise them) and all sorts of people have different ideas about how to reform them. Teachers are inundated with new fads and fashions and constant hype about "silver bullets" that will leave "no child behind".

Today there is a great deal of interest in and a lot of hype about using video games in schools. This includes commercial games like *Civilization*, *The Sims*, *Portal*, or *Minecraft* or "educational games" like *Dragon Box*, *Quest Atlantis*, *Immune Attack*, or the *i-Civics* games. Video games are a new "silver bullet". Games can create good learning because they "teach" in powerful ways, but what many people miss in the rush to bring games to school is that the teaching method good games use can be implemented with or without games (though games are one good platform with which to deliver such teaching). In fact, the theory behind game-based learning is not really new, but a traditional and well-tested approach to deep and effective learning, often instantiated in the best problem-based and project-based learning.

Recent work on learning suggests that human beings do no learn primarily from generalizations and abstractions. They learn from experiences they have had and shared with others. They find patterns in these experiences with the help of good teachers. With enough experience they can eventually generalize from these patterns to form larger generalizations or principles.   For example, a learner who has learned, through simulations or actual experiences in a lab or the

world, how Newton's Laws of Motion apply to one situation (e.g., an accelerating car in a race) gain an embodied and situated understanding of those laws. As they gain such understanding in more and more situations, they eventually come to see the laws as quite general and can think about them in quite abstract ways as applying to a great many situations.

Words in a text or textbook gain their meanings from the experiences people have had, not from definitions in terms of other words. They words in a manual for a game are about the actions and images in the game; the words in a biology text are about the actions and images in the world as biologists engage with it. The game or the world of plants, animals, and cells is what gives meaning to the game manual or the biology text. If a student has no experiences (no actions or images) to being to a text, the student cannot understand the text deeply. That is why doing comes before reading. You need experiences before texts make sense and then you can use them to learn new things and improve the learning you do in new experiences.

Because learning is based on experience, students do not learn facts ("information") well if we just focus on facts themselves. They learn and retain facts best when they use these facts as tools to solve problems. Teaching that focuses on facts can get paper-and-pencil tests passed, but such learning does not lead to problem solving. Teaching that focuses on problem solving and that uses facts as tools to solve problems leads both to fact retention and problem solving.

However, there is a problem with learning from experience. It can take a lot of time and learners can fail to know what to pay attention to in their experiences. The sorts of experiences that lead to the best learning are experiences that are well designed and well mentored via good teaching.

And here is where games become one good tool among others: games are just well designed experiences in problem solving.

So how do good video games teach?

- They focus on well-ordered problems, not facts and information.

- They give players good tools with which to solve the problems (including other players in multiplayer gaming and facts and information as tools).

- They have clear goals, but, nonetheless, encourage players to rethink their goals from time to time.

- They lower the cost of failure so that players will explore, take risks, seek alternative solutions, and try new styles of play and learning.

- They put performance before competence and they put experiences and actions before words and texts. This means players learn by doing and that they have images and experiences to give deep meaning to the words and texts they read later in order to resource their play and learning.

- They give copious feedback and they assess all along the way to ensure that the player is always well prepared for what comes next.

- They connect playing and learning to social interaction and mentoring through collaborative and competitive play, as well as through interest-driven fan sites where players can extend and articulate their knowledge and even produce new knowledge and designs.

- They ensure that at each new level, players face new problems that challenge the routine mastery they have developed through lots of practice on the last level (this has been called "the cycle of expertise").

- They use narrative in two ways to create engagement. They often have stories that make clear why the players are doing what they are doing and what it means. And they allow players to create their own stories through the consequential choices they have made in the course of game play.

- They hold everyone to the same high standard (everyone, for example, fights the same "bosses"), but allow players to reach these standards in different ways and in different amounts of time (so it does not really matter where or when one started, only where one finishes).

- They deal with transfer as "preparation for future learning." You can see how well players have learned by seeing how well they do in similar later and harder games or problems in life.

- Gamers have to think like designers even to play, since they have to figure out how the "rule system" in the game works and how it can be used to accomplish their goals. They can go further and "mod" the game (make new levels or versions) by using the design software by which the game was made.

Teaching this accomplishes all of the above factors I will call "Teaching as Designing" (TAD)—that is, designing good experiences where students solve problems. Good game designers are teachers and good teachers are designers of good learning experiences.

There has been over the last few years a quite specific interest in using games to teach language and literacy as part and parcel of learning content. It should be clear that TAD is a good deal closer to how people acquire new languages *in situ*, rather than in standard classrooms with textbooks or drill sheets. And we should be clear that learning a language and learning literacy are problem solving activities when and if they are to become real skills and not just test passing skills. Learners need to use the language or literacy skills they are learning to carry out communicative or cognitive goals, actions, and functions that are consequential to them.

Good video games have design features that are particular relevant to language learning. They often use "concentrated samples". Concentrated samples are situations where you present players or learners with many more instances in a short time of important cases than they would see in reality.   This is an important tool in language and literacy learning. Good games can lower the affective filter by creating engagement and situations where learners' fears are by-passed. Good games can create talk and text both in the game and outside of it in an interest-driven site where players discuss the game, game play, and problem solving, gaining meta-cognitive and meta-linguistic skills. Games can create hours of practice by placing lower-level skills inside larger more motivating and engaging problems.

But the main thing games can do for language learning is to "situate meaning". Games associate words with images, actions, goals, and dialogue, not just with definitions or other words. Learners come to see how words attach to the world's (contexts, situations) they are about and help to create or manipulate. If learners can only "cash out" words for words, they have a purely

verbal understanding of talk and texts. This may be good for test passing, but it is not good for deep understanding. If they can "cash out" words for images, experiences, actions, goals, and dialogue—for a virtual theater motivated action in their minds—then they have deep understanding and real learning.

In the end, teachers should remember that children have important experiences in and out of school. School alone cannot solve all the problems of our society. Children who do not have rich well-mentored learning experiences out of school are at risk for school failure and failure in later life. We all, as educators, have to insist as strongly on social reform as we do on school reform.

Note: For research relevant to the claims in this article, see: Gee, J. P., *Situated Learning and Language* (Routledge, 2004); Gee, J.P. & Hayes, E.R., *Women as Gamers: The Sims and 21ˢᵗ Century Learning* (Palgrave/Macmillan, 2010); Gee, J.P. & Hayes, E.R., *Language and Learning in the Digital Age* (Routledge, 2011); and Tough, P., *How Children Succeed* (Houghton Mifflin, 2012). For readers looking for a place to start, see (and follow) Edutopia (edutopia.org), including their section on Game-Based Learning. For a first game, download *Dragon Box* (dragonboxapp.com), a game that is great preparation for future learning in Algebra, even if you hate algebra.