



## HOW VIDEO GAMES CREATE GOOD LEARNING

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Good video games—games like *Rise of Nations*, *Age of Mythology*, *The Elder Scrolls IV: Oblivion*—turn learning into pleasure. Here are some of the ways games do this:

They offer players strong identities. Learning a new area—whether science or furniture making—requires that we see the world in a new way, the way in which a physicist or furniture maker does. In video games, players learn to see the virtual world through the eyes of a distinctive and appealing identity (e.g., Solid Snake in *Metal Gear Solid*) or one they themselves have built from the ground up (e.g., in *The Elder Scrolls*). We see the point and “buy in” right from the get go.

They make players think like scientists. Game play is built on a cycle of “hypothesize, probe the world, get a reaction, reflect on the results, re-probe to get better results”, a cycle typical of experimental science.

They lower the consequences of failure. When players fail, they can start from their last saved game. Players are encouraged to take risks, explore, and try new things.

In good video games, problems are well ordered—that’s why we have level design—so that earlier problems lead to hypotheses that work well for later, harder problems.

Good games offer players a set of challenging problems and then let them practice these until they have achieved mastery. Then the game throws a new type of problem at the player (sometimes this is called a “boss”), requiring the player to rethink and move to a new level of mastery. This cycle of consolidation and challenge is the basis of the development of expertise in any domain.

Good games try to stay within, but at the outer edge, of the player's "regime of competence". That is, they feel "doable", but challenging.

Games encourage players to think about systems, not isolated events, facts, and skills. In a game like *Rise of Nations*, players need to think how each action they take might impact on their future actions and the actions of the other players playing against them as they each move their civilizations through the Ages.

Games encourage players to explore thoroughly before moving on, to think laterally, not just linearly, and to reconceive one's goals from time to time. Good ideas in a world full of high-risk complex systems.

Games recruit "cross-functional teams" just like modern high-tech workplaces. In *World of Warcraft* each player must master a specialty, since a Mage plays differently than a Warrior, but understand enough of each other's specializations to coordinate with them. Thus, the core knowledge needed to play is distributed among a set of real people in a team, much as in a modern science lab or high-tech workplace.

Games almost always give verbal information "just in time"—when players need and can use it—or "on demand" when the player asks for it. They don't make us read lots of stuff before we can see how it applies, though we can read a whole encyclopedia in *Civilization* when are ready.

Can we design video games with these deep learning features that teach the sorts of skills and content we value in school? That is the challenge of the emerging field of games and learning.