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Why Game Developers and Educators Need to Work Together: Developing Games as an Educational Tool to Teach 21st Century Job Skills

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As a professional who hires graduates from college, I have begun to notice a disparity between graduates' skill sets and what is necessary for a modern workforce. The modern workforce is primarily comprised of Thought Workers who either graduate from college or require at least two years of training. Thought Workers are people who need to solve problems, work well in teams, and communicate with a variety of clients, both internal and external.

Most will agree the current educational system is not preparing graduates for these kinds of jobs. The educational system promotes working independently, having limited contact and interaction with authority, and sitting quietly and absorbing information. The system does not reward problem solving, communication skills, teamwork, and collaborative behavior.

Additionally, most professors will work to accommodate complicated histories, personal lives, and input/interference from parents who have different philosophies about how their child should be taught, treated, and graded. This atmosphere is starkly different from the working world, and does a great disservice to the graduates, as bosses don't care about personal lives and often set rules that people must follow. . . or be fired.

What Can be Done to Bring these Two Worlds Closer Together?

There is one constant throughout childhood, regardless of how it is described – games and play. All children are attracted to play; as adults we call it “recreation” or “hobbies.” Games are fun; and, at the end of the day, those activities that attract our attention (and at which we excel) are the activities to which we devote more time.

My belief is that game development can teach the tactical level skills that are graded on papers, while training students for a life working in teams, having to deal with multiple and different kinds of people, and having to solve problems on their own.

There is a growing body of research that shows a link between games and the development of cognitive and social skills that are prerequisites for learning more complex concepts as children get older. Game development has a high potential for fostering many areas of a students’ growth because during the development process students must engage in specific activities not taught in other areas. First, students must create a game by negotiating and discussing with peers. Second, students create specific roles for each other and develop rules about how a team will coordinate. Third, students must learn a topic in depth in order to create gameplay.

Throughout school, many teachers use games to help with rote memorization, speed in calculation, and critical thinking. However, these games often have drawbacks. These games have a public, interactive factor that video or online games do not have. Students may be discouraged from playing, or playing well, due to social issues. Any student who is naturally shy, introverted, or

suffers from a stutter will not participate and can be turned off to the topic due to performance anxiety. This is the opposite effect the educator seeks.

The utilization of video games in the classroom has some obvious and direct applications. Students can play typing games (Typing of the Dead) to learn how to type faster and with higher accuracy. Math facts and spelling can be made interactive and more enjoyable.

Most of the games in education are put into the context of math, spelling, typing, color match, shape match, vocabulary, and other basics. These games are a step above rote memorization, but have more appeal to students. Aside from being solo experiences, they do not teach critical thinking or problem solving. Even a popular game like Oregon Trail was still a solo experience and did not teach other skills outside the understanding of a narrow point in history. These games can be important in learning basic skill sets and should be encouraged as study tools. But, to improve engagement and teach multiple skills at once, the entire way we view games and education needs to change.

People who actually create video games have to learn many new things on a regular basis. From new programming languages, to art techniques and base understanding of physics game developers are constantly learning. Additionally developers must utilize each of these skills daily: teamwork, communication, conflict resolution, critical thinking, and problem solving. Game development is easily accessible as a learning experience.

Tools

There are many tools available that allow for fast and easy game development. The best tool to use is the one you can teach

in. In selecting tools, one should consider that some gameplay lends itself better to 2D rather than 3D tools. Another point to keep in mind is that the development cycle needs to be quick, so there should be less focus on learning a complicated tool and more focus on learning material to create a game with a team. Some 2D tool suites like GameMaker, Construct, Stencyl, Corona, and GameSalad work to help students create games quickly. Unity and Torque are 3D tool suites, and should only be used by students who have experience in the tool or have a longer development timeline.

And, if you do not have computers readily accessible, that's OK! *Rules of Play*, by Katie Salen and Eric Zimmerman, has some great ways to create games based on real-world items: paper and pencils.

Topics

How could game development work in practice as an educational experience? Every educator has a series of topics students need to learn and will be graded on. For example, a chemistry educator may want her students to learn the periodic table, and how specific chemicals interact. Developing a game about the periodic table is simple, especially if you use a 2D engine that has some drag and drop aspects to it (GameSalad or Corona). The project could kick off by providing students a one-line summary of what they need to do: Build a game that teaches the periodic table.

Process

Start out by giving the students some time to 'play' with the development tools. Have them run through the tutorials so

that they can choose the development tool they would like to use. It is valuable to allow students at least two options throughout each step in the process. Some choices may be “wrong” or poorer choices, but they will learn from their poor choices and will have to “pick up the slack” later in the process. This is an important part of the learning process, having to deal with the consequences of one’s choices.

Once the students have gone through all of the tutorials, have them form teams. For something like the periodic table game, split them into teams of 3-4. The teams should be randomly assigned. The reality, in our professional lives, is that we often do not have any say regarding who we work with. Working with strangers is an important real life skill.

Each team has to have a leader. Throughout the school year, make sure to change up who gets to lead for different projects. Being a leader means being responsible for other people getting their work done. And being responsible for bringing up team problems – especially other students not pulling their own weight.

The team determines the type of game they want to create. Give them a limited amount of time to define their design—on paper. Each group will have a slightly different take and it is important to be open to student’s ideas. The only vetting question for the game should be, “How will students learn the periodic table through your design?”

Give the team deadlines to accomplish each stage of development, initial design, first iteration, second iteration, and so forth. Run this as if you were a project manager. If students ask how to do something—point them to tutorials, or Google. Review each project regularly, providing input and feedback based on whether or not you think someone can learn the periodic table from the game.

You should allow the students to ‘fire’ any team member. An evidence-backed argument must be presented, and you are the arbitrator. Anyone who is fired has to try to do the project on their own, or get a failing grade. This mechanism helps eliminate the slacker in a group. In the instance of social ostracism, dock the aggressors some of their individual effort scores. Grading can be done 75% team effort and 25% individual effort. This means the overall project is worth the largest part of their grade, but there is room for the educator to alter grades according to effort.

Real Life Example

In 2012, David Conover, of Pflugerville’s Connolly High School, had students create games about solar energy. The games were targeted at 8-12 year olds who were part of a solar car racing camp. The high school students had to split into five teams and build five different games. At the end of the four weeks, the games had to be completely playable. Students would be paid for their work, and could be fired if they did not pull their own weight. Each group researched solar panels, discussed ideas, and trimmed them until each title had a unique game.

The students learned communication, critical thinking, problem solving, teamwork, work ethic, conflict resolution, and how solar panels work in order to complete the project. No one got fired for slacking off—each person had a reason to be there and wanted to do a good job. As a game development professional, I was asked to review their processes (or lack thereof). Another professional donated a few hours as well, providing more guidance through the game development process.

Conclusion

Inherently, the game development process lends itself to the modern workplace. As a team-based development cycle, game development is interdisciplinary, with high requirements around teamwork and communication skills. Each person needs to be able to clearly convey ideas, listen intently to co-workers, and negotiate for their ideas.

Students like to play games, make things up and have fun. Video game development lets them do just that. Create a game, make up all of the rules, play your game to see if it worked, and have fun while learning about incredibly complex ideas.

Education is supposed to prepare students for their work life. The current education system is based on the assembly line: the ability to handle base memorization, follow orders, and get things done as quickly as possible. The modern workplace in the United States is changing rapidly due to globalization. It is important our education system keep up with the demands of the workforce. No longer is it just factory jobs being outsourced, but jobs requiring higher education as well. What will set graduates apart are the 21st century job skills. Pairing game development with teaching traditional topics can improve a student's chance of landing a position within their chosen field.

Jennifer Bullard is a 15 year veteran of the game industry, having shipped over 20 products and hiring over 150+ people. As a designer and product manager she has overseen the development of games, and been responsible for building teams and working with disparate groups of people to ship products in

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high pressure environments. Jennifer currently is focusing on improving the employee career cycle within the game industry.