

Exploring the Solar System in Two Classrooms

In Spring 2009, I taught a course on Serious Games at DePaul University to 14 undergraduate game development majors. The course content focused on learning sciences and empirical evaluation of learning. The project work for the course was completed with the cooperation of a 7th Chicago Public School teacher and her class. Planetary science was chosen as the topic area for our games because it was included in the Illinois Standard Achievement test for 7th grade, but not included in their curriculum. From the Illinois State Assessment Framework, we identified the relevant standards and used them to motivate game ideas.

My students formed two project groups. Each group included students with concentrations in game production, development, graphic design, and music. In an initial brainstorming session, students individually generated game ideas, then shared them with their group, selected several, and refined them. In a second session, the groups discussed all of their game design ideas, evaluated them, refined them, selected the best, and presented them to the class as a whole. Independently, the groups created a complete game design using a combination of Winn's (2009) Design, Play, and Experience Framework and a framework adapted from a regular game development class. The completed design included an introduction, the core mechanic, learning layer, storytelling layer, gameplay layer, user experience layer, technology layer, drawings, content, and publisher schedule.

In one game, *Planetary System Builder*, the player starts with a solar system which only has the sun, and launches the planets (by dragging them at the appropriate distance and speed) into orbit. In the other game, *SolarSurveyor*, the player is given the goal of constructing probes to send to collect detailed information about the planets. When the player selects a planet, the game provides some initial information about it, including its composition, atmosphere, size, and distance. The player then constructs a probe by combining an appropriate engines, landing gear, and sensors, and launches it to the target planet.

The groups created paper prototypes of their designs and performed playtesting. Then they refined the designs and made their initial implementations. We took the implementations to the 7th grade class, along with a short multiple choice pretest on planetary science that the groups had created. The 7th graders completed the pretest then viewed the prototypes, and gave their feedback. In the next two weeks, the project teams created their final versions of the games. For our final exam, we again visited the school, and let the students play the games. Then we administered the posttest, went back to our classroom, and quickly analyzed the data. We found a small learning gain. This was somewhat surprising given the informal nature of the testing, the limited amount of time that the students interacted with the games, and the fact that it was the last week of school. In any case, it was clearly a powerful learning experience for my students who had the opportunity to see urban kids playing games that they had created, and perhaps learning from them.