GLASSLAB
RESEARCH

Students who play Mars Generation One for three hours with two hours of instruction can make as much as one year of learning gains.

Overview

Results from a field study of Mars Generation One, conducted in collaboration with Educational Testing Service and Pearson, show that students who play Mars Generation One for three hours with two hours of instruction can make as much as one year of learning gains in key aspects of argumentation.

GlassLab games generate learning insights for students and adults while improving student performance on complex challenges. By leveraging embedded, unobtrusive assessment, student and teacher reports and advanced psychometric models (Mislevy, Corrigan et al., 2014), our games detect improvements in student performance and deliver just-in-time feedback. They do all of this while motivating students to engage with tough concepts over extended periods, and return for more.

The Innovation

Mars Generation One is a text-based futuristic adventure game developed in **collaboration with Educational Testing Service, NASA and the National Writing Project**. The year is 2054. The setting is the first human settlement on Mars. Citizens settle their differences and make important policy decisions by sending robot assistants—or "argubots"—into debates reminiscent of the assemblies in ancient Greece. Aligned to Common Core ELA standards for the middle school grades, the game introduces and develops players' core argumentation skills. These include: identifying evidence in text, organizing evidence to support claims, and evaluating and critiquing arguments through use of critical questions.

Pilot Participants and Implementation

Students from across the country participated in the Mars Generation One field study, drawn from classes taught by twelve teachers in nine states. The study involved over five hundred students (n = 589) in grades five through nine and yielded **over 3 million game-based learning events in a six-week period.** Implemented over five class periods, the pilot included three 45-minute periods of game play, in addition to two traditional classroom routines, each lasting approximately 20-30 minutes.

Analyses & Results

Overall results show that students who play MGO for three hours with two hours of instruction **can make as much as one year of learning gains in key aspects of argumentation.** Students who play the game can increase their competency significantly in identifying argument components, organizing arguments, and evaluating the arguments of others. For students just beginning argumentation in middle school, playing MGO can help them move from skills such as identifying a reason or piece of evidence that supports a specific claim towards being able to identify and generate multiple reasons in an argument. For students with a higher level of competency in argumentation, playing MGO can help move them from skills such as identifying and organizing multiple pieces of evidence that support a claim towards being able to evaluate others' more complex arguments and rebut others' critiques of their own arguments.

MGO's in-game assessment also proved to be a valid measure of argumentation. This means that **simply playing MGO provides a solid assessment of student argumentation ability**. These results also highlight the effective learning design of the game, as in-game debate strategies significantly indicated argumentation skill. In addition to being a valid instrument for learning and assessment, MGO effectively motivated students. **Over 80% of students reported persisting through hard parts of the game**, and 72% of students reported that the game taught them "a lot" about good argumentation.

Three out of four students playing **Mars Generation One** are **mastering** core aspects of **argumentation.**

Conclusion

MGO engages students and supports their success in the challenging skill of argumentation. Through game-based tutorials, personalized feedback and scaffolded design, students who play MGO for three hours with two hours of instruction can make as much as a year of learning gains in key aspects of argumentation. Moreover, three out of every four students playing Mars Generation One are mastering core aspects of argumentation—matching evidence to claims, identifying argument schemes, and evaluating and critiquing others' arguments.