

# Students playing SimCityEDU made statistically significant gains in systems thinking.

**Game: SimCityEDU**

Research Date: 2014  
 Grade Levels 6-8  
 Sample Size: 400  
 Study Type: Program Effectiveness

**Overview**

GlassLab games improve student performance and generate insights into student learning by doing what games do best, dropping learners into complex environments, guiding their exploration and providing personalized feedback to motivate sustained effort and exceptional performance. A recent pilot study held in classrooms across the country showed GlassLab's learning games hold great promise as learning and assessment tools.

**The Innovation**

GlassLab games teach challenging concepts. They are also state of the art assessments. GlassLab's ability to design engaging learning experiences that afford real time performance-based assessment information is helping teachers better understand what their students know while making students' environments more responsive to their needs.

SimCityEDU, for example, puts students in charge of several busy cities in order to teach and assess systems thinking. The game supports learners in mastering three core systems thinking skills: identifying, investigating, and operating on multiple independent variables in complex economic and environmental systems.

**Pilot Participants and Implementation**

A recent pilot of SimCityEDU with over four hundred middle school students from across the country revealed major gains in performance on tough challenges. As a part of the eight day pilot, students participated in four 45 minute class sessions working with the game and another four 45 minute class periods with more traditional instruction introducing Common Core English Language Arts standards for reading informational text and creating models as aids for reasoning about complex systems.

**Analyses & Results**

Game log data were analyzed for improvements in students' ability to identify, investigate, and successfully manipulate multiple independent variables to improve economic and environmental conditions in their cities. Researchers from the Educational Testing Service, Pearson and GlassLab Games applied core principles of evidence centered design and best practices in educational data mining, including several iterations of exploratory and confirmatory analysis and statistical modeling (Mislevy, et al., 2014).

Key findings show student performances improved during engagement with SimCityEDU. Comparing players' first and best performances, the game leads to improvements in systems thinking with effect sizes from 0.47 to 0.87 standard deviations (Cohen's d). Those results match or exceed well researched education inputs, placing the game-based assessment and others like it among the top five researched classroom inputs (Hattie, 2009) for improving student performance.



**The game leads to improvements in systems thinking with effect sizes from 0.47 to 0.87 standard deviations.**

**Conclusions**

GlassLab's SimCityEDU improves student performance on complex systems thinking and problem solving tasks while also generating insights into student learning by providing personalized feedback to students and teachers. Results from this study document the potential of complex game experiences to support students' improvement on key 21st century skills.

**References**

Hattie, J. (2013). Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge;  
 Mislevy, R.J., Oranje, A., Bauer, M.I., Von Davier, A., Hao, J., Corrigan, S., & John, M. (2014). Psychometric considerations in game-based assessment. GlassLab Report.