Research Goal

• Enable a rich learning experience through a dynamic environment.
• Help students learn complex materials by interacting in an immersive virtual environment.
• Help teachers assess students by providing in-depth analysis based on student’s behavioral data.

Role in IMSC

• Vision: Enable immersive technology closely coupled with innovative curriculum design and meaningful assessment tools to increase efficiency and improve the quality of the learning experience.
  “Our mission is to pioneer a new learning paradigm with high presence, and high fidelity technologies.”
• BioSIGHT is strategically positioned to develop and test a new paradigm for the application of immersive technologies to science learning and education.

Research & Development Approach

• Research Approach:
  • The approach addresses how learning can be conveyed through games without diminishing learning content.
  • Accomplished through education oriented Immersive game:
    • Define learning objectives
    • Develop back story and game-play (task based)
    • Validate concepts and solutions with usability testing
  • Game development:
    • Use state of the art software development techniques: version control tool, defect database, code review...

Accomplishments

• Contributed to the “Metalloman” game scenario.
• Set-up a 3D authoring pipeline using 3D Studio Max, Quark, Photoshop and Torque world creator.
• Implemented 3 levels of game-play using a commercial engine (Torque Game Engine from Garage Games).
• Defined innovative game concepts to support student’s assessment and improve the learning experience: prototyping using usability tests.
• Integrated data mining technology to provide users with feedback and added support for 5.1 sound.

Results show a 10% improvement for students answering content related questions after game-play.

Uniqueness & Related Work

• Related Work:
  • Edutainment: Games for history.
  • Games to Teach: MIT students, game developers for math and engineering.
  • Mission to Arabic: ISI, USC. Uses A.I. and computer game techniques to make learning languages easier.
  • 2020Classroom effort Uniqueness:
    • Targets undergraduate biomedical engineering students.
    • Addresses the challenge at each level of content development, technology integration, learning and usability issues, as well as assessment.

5-Year Plan

• Complete development of the Metalloman mission.
• Design and implement game elements where physiological equations drive content interactions.
• Add support for 10.2 spatial sound.
• Use lessons learned to provide new directions for the development of advanced educational systems.
• Implement and assess novel interaction devices.
• Investigate analysis tools to improve learning and assess students.