



Learning Technologies NASA STEM Learning MMO Game Plan

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NASA Education Strategic Outcomes

The NASA Education portfolio is guided by three desired outcomes:

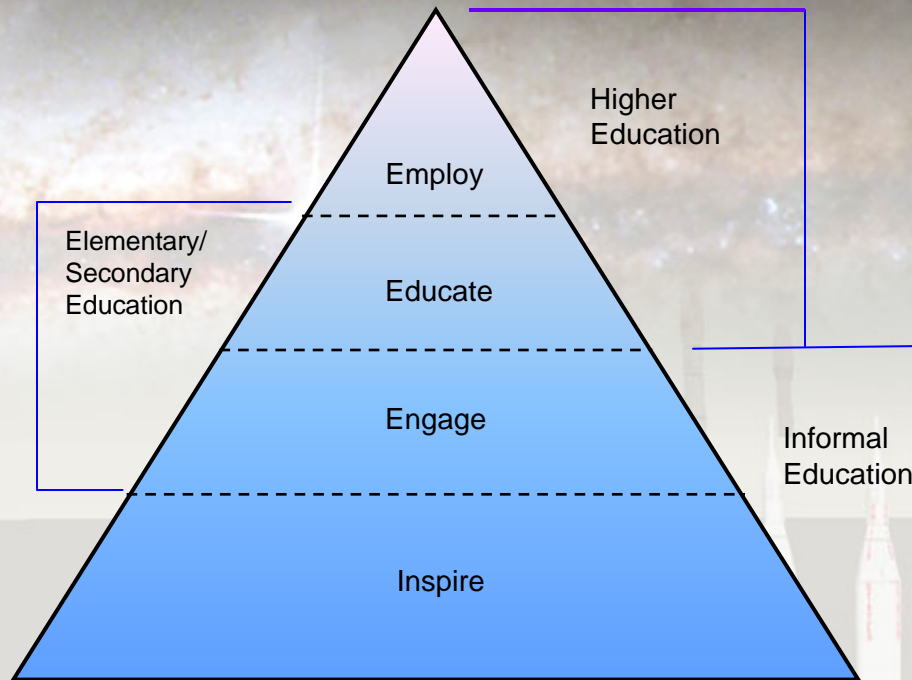
Outcome 1: Employ - Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals, through a portfolio of investments

Outcome 2: Educate and Engage - Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers and faculty

Outcome 3: Inspire - Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission



eEducation Role in Strategic Outcomes



Outcome 1: Employ - eEducation computer-based simulations and synthetic engineering environments will facilitate learning, development and collaboration among future and current aerospace researchers.

Outcome 2: Educate, Engage - eEducation fields instructional technology tools that support best practices of inquiry-based learning. eEducation technology products and services enhance the educational process for formal and informal education.

Outcome 3: Inspire - eEducation supports *inspire* efforts by highlighting the amazing activities unique to NASA by using NASA TV and the Web. These events are exciting, interactive, informative and educational.

eEducation crosscuts Education Programs, Mission Directorates and Field Centers is a **common thread** within each level of the Education Framework is a **central tenet** in addressing each of the Education Outcomes is an **overarching outcome** on diversity and accessibility



NASA eEducation Roadmap

**NASA eEducation Roadmap:
Research Challenges in the Design of
Persistent Immersive Synthetic
Environments for Education & Training**

Prepared for NASA eEducation

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The roadmap establishes a coordinated agenda for the funded research and development work of eEducation. It relies heavily on the application of game technology. eEducation encourages other parties with an interest in educational technology research and development and games as learning media to participate and contribute to this agenda.



Roadmap Components

The following technology components are integral to implementing the concepts set forth in the Roadmap. These components will build a firm foundation for an immersive, synthetic 3D Web application for NASA science education:

- the central component is a Massively Multi-player Online Game (MMOG)
- the MMOG acts as a front-end to a larger synthetic environment
- the MMOG contains a developers toolkit to support expansion
- the MMOG uses a powerful physics engine to support accurate science and engineering concepts and challenges
- the components support both formal and informal education



The Concept and Planning Documents

“Harnessing the Power of Video Games for Learning”

Federation of American Scientists, 2006

<http://www.fas.org/gamesummit/>

“A Guide to Educational Uses of Games for NASA”

Learning Technologies Project Office, 2005

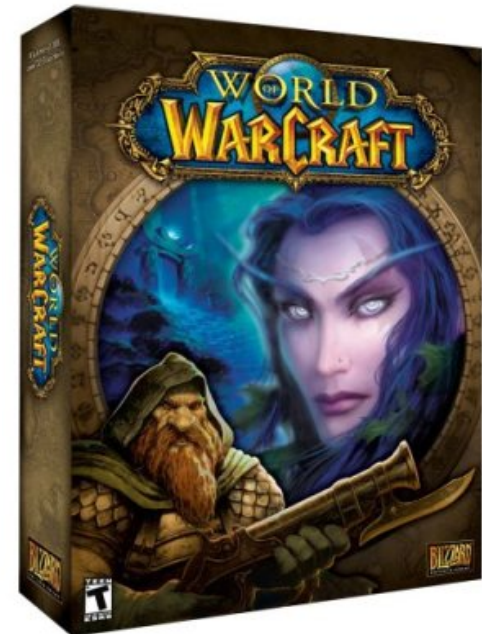
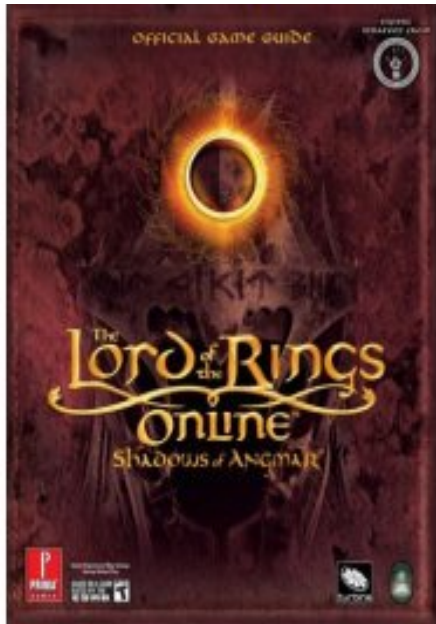
<http://learners.gsfc.nasa.gov/NLT/road.html>

“Learning Federation Science and Technology Roadmaps”

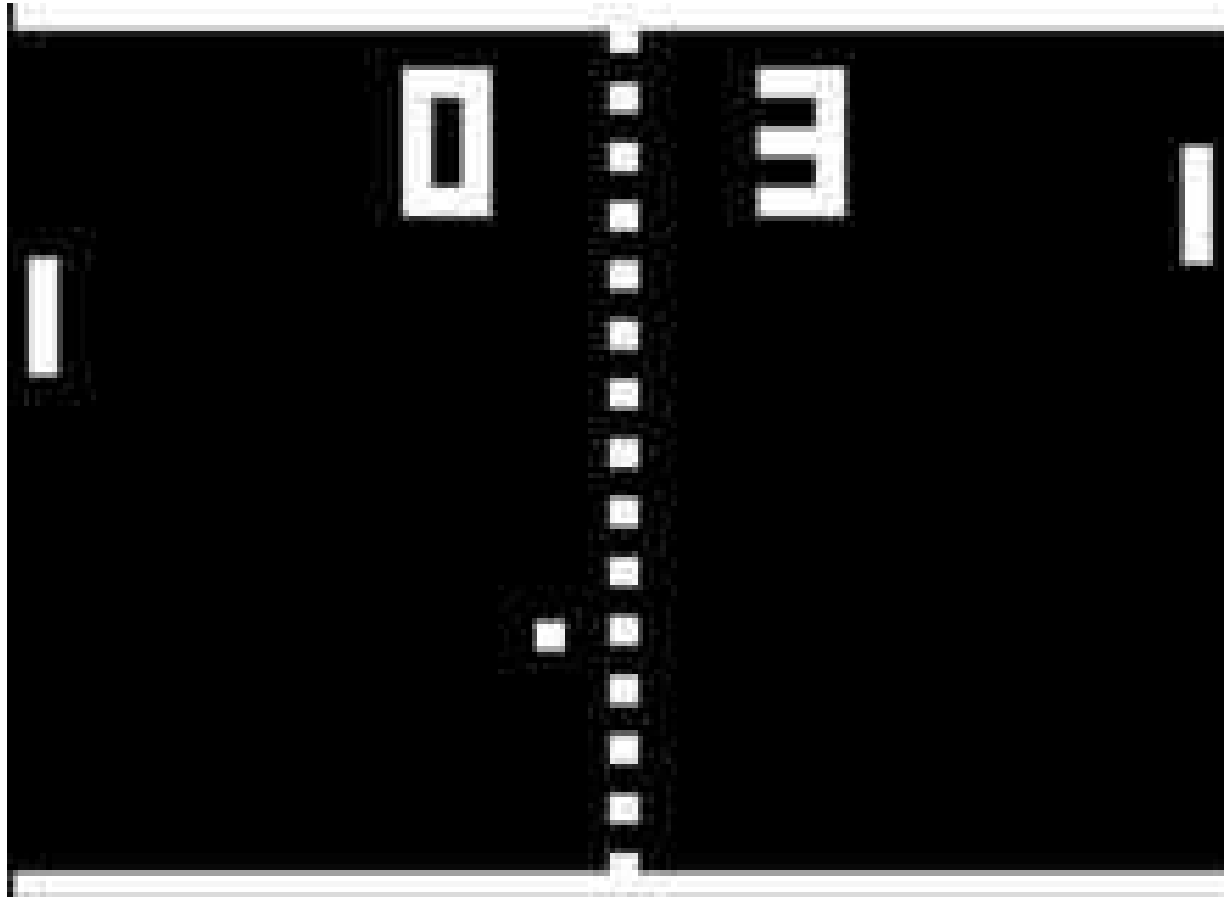
Federation of American Scientists, 2003

<http://www.fas.org/main/content.jsp?formAction=297&contentId=69>

Massively Multiplayer Online Games



Pong, 1972



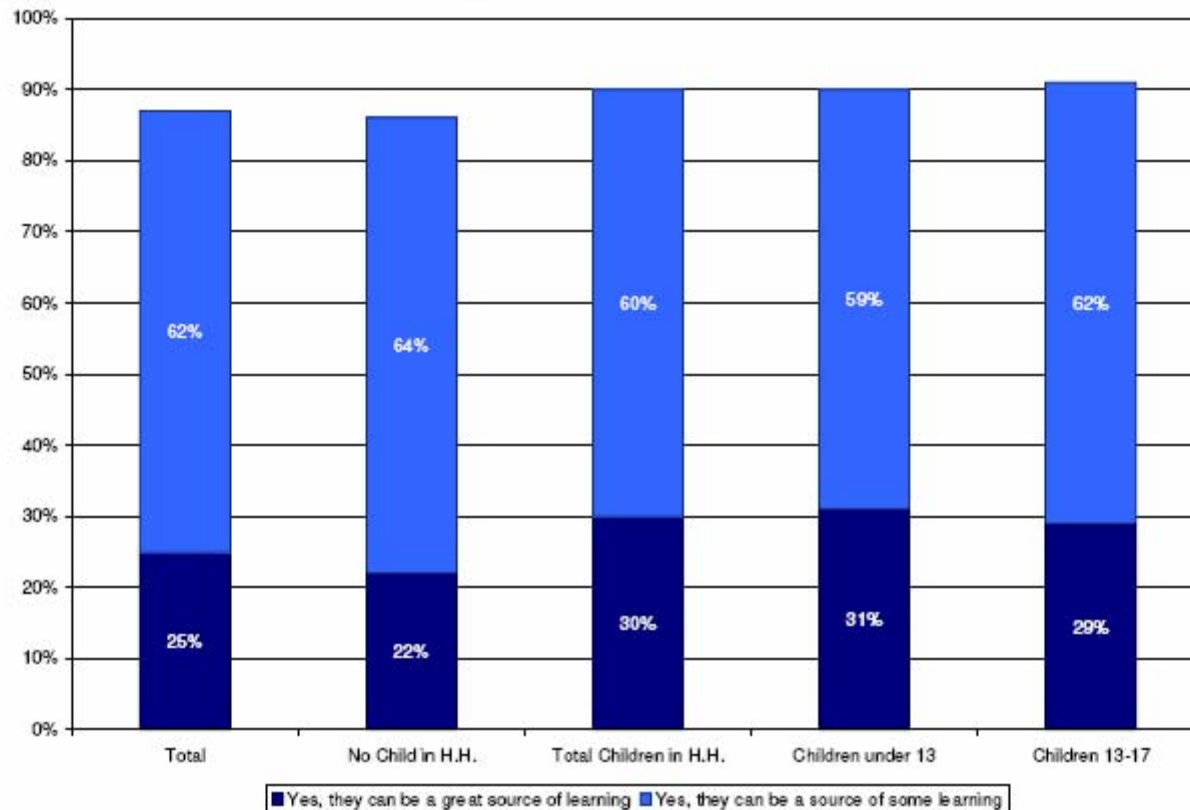
World of Warcraft, 2006



Real Life Government in Second Life Inaugural Meeting



The majority of families believe that video games can be a potential source of learning



Q3: Do you consider video games to be a potential source of learning?



LT Solicitation Plans FY08

- Gather creative input and generate interest through a request for information
- Solicit for an experience development partner directly
- Solicit for academic and educational expertise directly
- Recruit NASA SMEs directly





Phase 1

- Phase 1: RFI asking how NASA can build a MMO STEM learning game (Complete. 168 submissions totaling 800 pages)
- Phase 2: Review RFI Submissions (Complete. 35 reviewers from all Center Ed Offices, SMD, ESMD, SOMD, OCP and IPP)
- Phase 3: Release RFP for development partner and Pre-proposal Workshop (April 21, 2008)

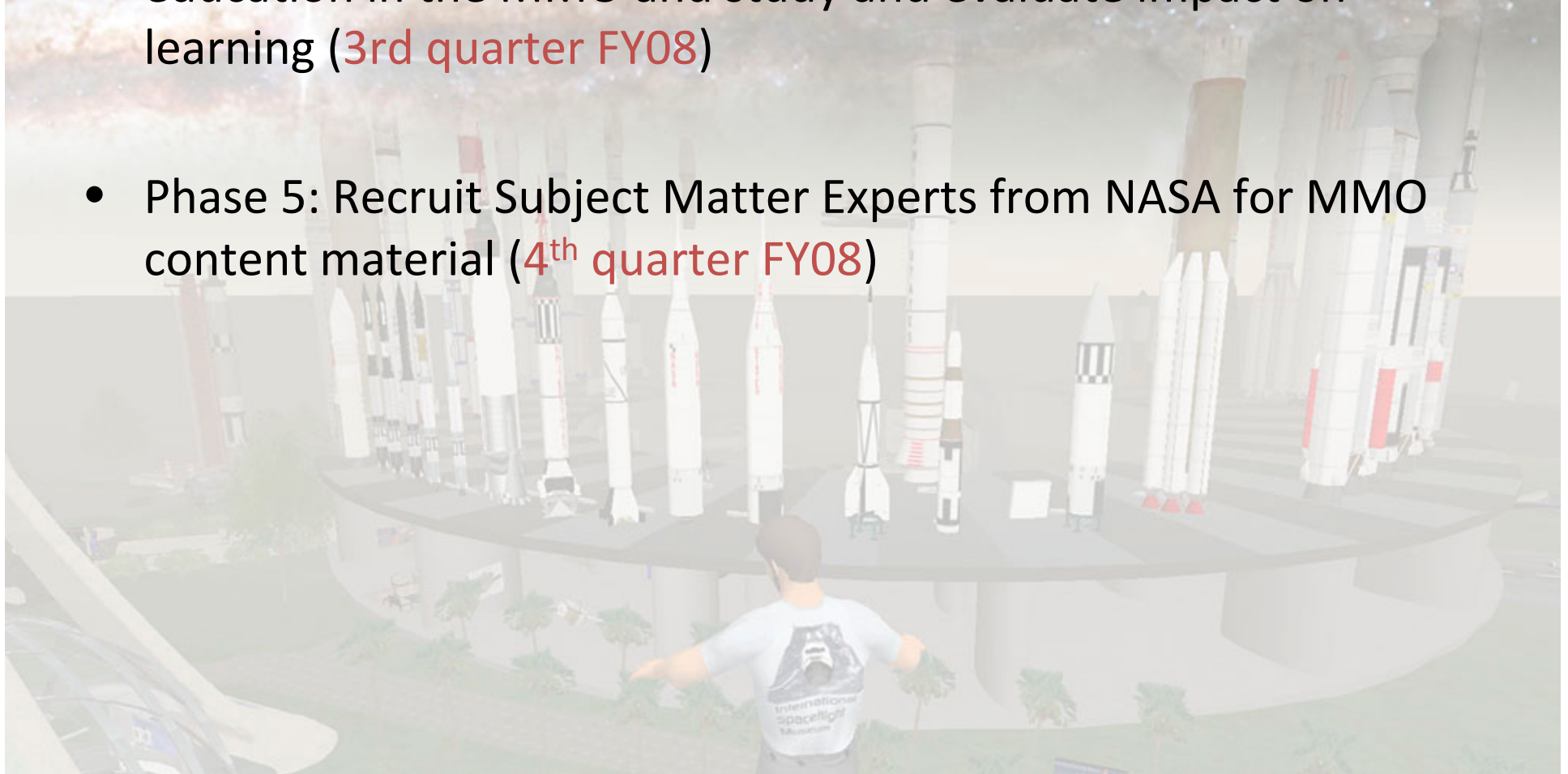
<http://ipp.gsfc.nasa.gov/mmo/rfp.html>

NOTE: Proposals due 60-days from RFP release



Phase 2 and 3

- Phase 4: Release CAN for academic partners to enhance education in the MMO and study and evaluate impact on learning (3rd quarter FY08)
- Phase 5: Recruit Subject Matter Experts from NASA for MMO content material (4th quarter FY08)





Phase 1

RFP for a non-reimbursable Space Act Agreement

- Solicit for an experience MMO development partner
- This partnership vehicle provides greater flexibility needed for an innovative project
- Encourages only serious, committed proposers with significant resources
- Taps commercial quality game development expertise and funding
- Encourages the partner to generate a revenue stream from the project



Phase 2

Cooperative Agreement

- Engage academic partners in the MMO
- Solicit for instructional design support for game development
- Solicit for evaluation experts to assess the impact of the game on learning
- Address eEducation research roadmap questions
- Fund up to \$500K per year



Phase 3

Recruit NASA SMEs

- Engage NASA mission experts in game content development
- Prevent propagation of science and engineering misconceptions
- Fund up to \$350K per year
- Seek Mission Directorate contributions of SME time





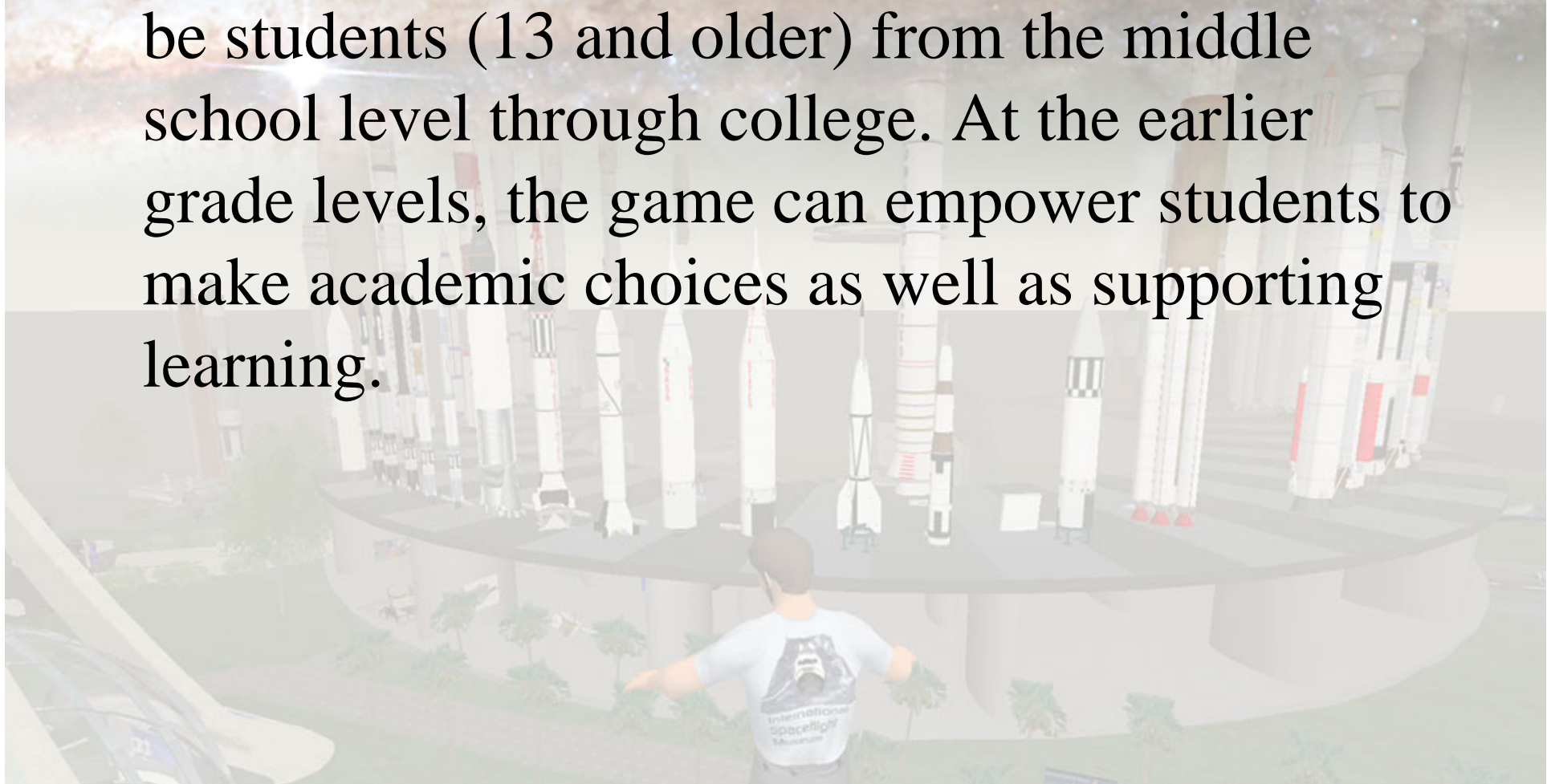
LT MMO Project Aims

- Include powerful physics capabilities that support compelling learning opportunities and virtual career exploration.
- Present real NASA engineering and science missions in a medium that is comfortable and familiar to the majority of students in the United States today.
- Provide opportunities for students to investigate STEM career paths.
- Contribute to the development of the critical skills and capabilities needed to build a pipeline of qualified scientific and technical employees required to fulfill the United States Space Exploration Plan.



Target Audience

The primary audience for this MMO game will be students (13 and older) from the middle school level through college. At the earlier grade levels, the game can empower students to make academic choices as well as supporting learning.





Threshold Requirements (1)

1. A commitment to developing an MMO game with an outstanding user experience.
2. Significant experience in successful design and implementation of an MMO game.
3. Support for realistic physics where practical and a commitment not to propagate physics and science misinformation and misperceptions.
4. Support for the development of a strong user community and extensive use of Web 2.0 style communications tools.



Threshold Requirements (2)

5. A commitment to work with NASA to enhance formal and informal education in alignment with *The NASA Education Strategic Coordination Framework: A Portfolio Approach*
6. Ability and commitment to support research on the proposed MMO as an educational tool and to build STEM education content and career exploration into game play.
7. Ability and commitment making the game accessible to disabled players.
8. No funding requirements from NASA.



Proposals Must Include...

1. Project plan describing the proposed game design and development including identification of the proposed platform and brief sample scenarios.
2. Documented metrics on the demographics and popularity of the proposed method.
3. Business plan describing the proposed method of funding and supporting the project.
4. Description of how the proposer will support infusion of educational elements and NASA content into the game.



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