

# UNIVERSAL DESIGN OF A TIER 2 FRACTION VIDEO GAME

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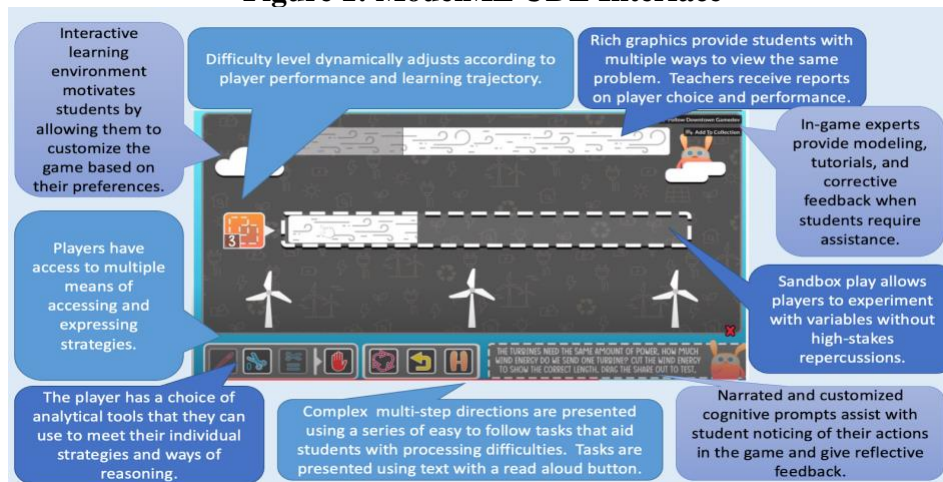
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The 2017 National Assessment of Educational Progress highlights stagnant and declining performance in mathematics, foundational to STEM and ICT, in both 4th (17% proficient) and 8th (9% proficient) grades. At the same time, promoting diversity in the workforce is paramount for U.S. innovation in STEM and ICT fields. Individuals with disabilities are underutilized members of the STEM and ICT workforce. In this poster, we report on Model Mathematics Education (ModelME), a universally designed video game embedded into a student-centered Tier 2 (i.e., supplemental) mathematics curriculum.

## Access, Advancement, and Power: Universal Design and Student Centered Instruction

Universal Design for Learning (UDL) addresses the need for students to access different tools to learn and express knowledge. Instruction is guided by three principles: (a) multiple means of engagement (i.e. considering how to engage students in multiple ways), (b) multiple means of representation (i.e. providing content in multiple formats), and (c) multiple means of action and expression (i.e. providing opportunities for students to demonstrate their understanding in multiple ways (see Figure 1).

**Figure 1: ModelME UDL Interface**



In session, we will demonstrate ModelME's use of student-centered design features and report on initial usability data with elementary school students.

## References

CAST (2020). Universal Design for Learning Guidelines version 2.2. Retrieved from <http://udlguidelines.cast.org>  
Hunt, J. H., Martin, K., Khounmeuang, A., Silva, J., Patterson, B., & Welch-Ptak, J. (2020). Design, development, and initial testing of asset-based intervention grounded in trajectories of student fraction learning. *Learning Disability Quarterly*, 0731948720963589.