

# Transforming Undergraduate Education

## A New System – Wide Competitive Program



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Academic  
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## Transforming Undergraduate Education - Background

- Proposed by Interim Chancellor Shine
- A tangible demonstration of the System's strong commitment to teaching and learning
- General Purpose
  - Develop new teaching and learning methods for future use across the entire System
  - Engage and challenge the creativity of the faculty towards innovation
  - To recognize and challenge the capabilities of our students
- Approved by the Board of Regents at \$2.5 million
- Managed by Pedro Reyes, Office of Academic Affairs



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## Transforming Undergraduate Education - Background

- To inspire – a vision for greater undergraduate success
- To enable – create constructive collaboration
- To leverage – significant return on investment
- To inform – showcasing innovative projects
- To influence – constructive ways for student achievement
- To evaluate – metrics for evidence of student success and performance on new instructional model

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## Transforming Undergraduate Education - Criteria

- An innovative and transformative new program, not simply a continuation
- Not duplicative of programs at other UT campuses
- Have potential for wide applicability throughout the System
- Based on sound educational and evaluation principles
- Principal investigator on UT faculty
- Inter- campus collaboration where appropriate

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## Transforming Undergraduate Education - General Results

- 50 proposals submitted from 12 Institutions
- 11 projects funded from 7 different institutions

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• UT Austin 3	\$736,631
• UT Dallas 3	\$555,338
• UT San Antonio 1	\$247,424
• UT El Paso 1	\$231,365
• UT Southwestern 1	\$229,357
Collaborations	
• UT Arlington / Dallas 1	\$249,981
• UT San Antonio / UT Pan American 1	\$249,904

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## Transforming Undergraduate Education - General Themes

- **Mathematics and Science**
  - Calculus
  - Organic chemistry
  - Biology
- Engineering
- Nursing
- History
- Success in large classes
- Retention and graduation rates
- Learning communities
- Inquiry learning
- Team learning
- Adaption to university culture

**5 projects employ serious gaming technology**

**8 projects are strongly interdisciplinary**

**2 projects are collaborations**

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## Transforming Undergraduate Education - Serious gaming

- **Serious gaming** is : “ a mental contest, played with a computer in accordance with specific rules that uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives” Zyda, 2005.
- **Our students** – technically sophisticated – gaming offers new ways to engage, motivate, educate
- **UT Office of Academic Affairs initiative**
  - Dr Tom Lineham ( UT Dallas) – Fellowship support
  - Major emerging themes
    - How to teach difficult subjects
    - International cultural awareness
    - Avoiding laboratory costs
    - Assessment

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## Transforming Undergraduate Education - Serious gaming

- “Digital calculus coach” – UT Dallas
- “ Building immersive instructional experiences and learning communities in Second Life” – UT Austin
- “Development of a Game-based experiential learning program to help students adapt to the University of Texas culture” – UT Dallas
- “Can game play teach student nurses how to save lives...in pediatric respiratory diseases with a living World Gaming construct” - UT Arlington / Dallas
- “Use of gaming technology to improve minority / disadvantaged college student’s performance in Organic Chemistry” – UT Southwestern

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## Transforming Undergraduate Education - the projects

- **“Digital calculus coach” – UT Dallas**
  - Players control Avatars representing themselves through gameplay worlds that are powered by equations, functions and calculus concepts
  - Move in a non- linear hierarchical manner learning concepts
  - The Calculus coach!
  - Self paced, reduces costs, reaches out to at risk students
- **“Transforming engineering programs in order to improve retention and graduation rates” – UT San Antonio**
  - Create a new mathematics sequence with engineering applications
  - Revamp the engineering curriculum to new math sequences
  - Continuous improvement model to assess progress

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## Transforming Undergraduate Education - the projects

- **“Transforming undergraduate education to create significant learning” – UT San Antonio and UT Pan American**
  - **Combination biology and history**
  - Use internet and information technology
  - Web version and modules towards Hybrids
  - Focus upon thinking and creativity
- **“ Building immersive instructional experiences and learning communities in Second Life” – UT Austin**
  - Second Life is a virtual world technology
  - Avatars representing participants
  - Creating a System –wide virtual learning community
  - An “island archipelago” – 49 islands – 2 System islands
  - Integration of virtual learning activities into existing curricula
  - Both classroom and online

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## Transforming Undergraduate Education - the projects

- **“Use of gaming technology to improve minority / disadvantaged college student’s performance in Organic Chemistry”**
  - **UT Southwestern**
    - Focus on minorities / disadvantaged students
    - 6 week enrichment experience expanded to 12 weeks
    - Develop game approach – experimental design
    - Measure specific achievement outcomes
- **“The Large Class Dashboard: Incorporating technology to promote student success in large classes” – UT EI Paso**
  - Enhance success / faculty effectiveness
  - “Dashboard” in digital grade book
  - Monitor participation, communicate with classes, effective interventions
  - Evaluate technology interventions
  - Apply to large classes

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## Transforming Undergraduate Education - The projects

- **“Inquiry learning across the sciences : a new model for teaching science to non- science majors” – UT Austin**
  - Non –science majors to get core scientific understanding and scientific method
  - A refocus on how undergraduate courses are delivered
  - Change from discipline specific courses to broad overviews
  - “Big Ideas” in science through modules
- **“Development of a Game-based experiential learning program to help students adapt to the University of Texas culture”**
  - **UT Dallas**
    - Online learning environment - day by day issue
    - Financial and time management
    - Promote analytical thought rather than seek and find
    - Pointers to where help can be found
    - Analysis of outreach programs – develop new approaches

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## Transforming Undergraduate Education - the projects

- **“Peer led team learning: creating a community of scholars in math and science” – UT Dallas**
  - Learning by doing - “Doing math “ as a ‘contact sport’
  - Small group mandatory weekly study sessions
  - Faculty set questions / problems – not during group work
  - Extend to organic chemistry and physics
  - Identify key concepts and reinforce
- **“Can game play teach student nurses how to save lives...in pediatric respiratory diseases with a living World Gaming construct” - UT Arlington / Dallas**
  - **Unscripted process for learning through simulation**
  - Virtual clinical experience – realistic setting
  - Complexity – changing patients symptoms
  - Assessment of student performance

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## Transforming Undergraduate Education - the projects

- **“Substantive redesign: the large American History Survey – UT Austin**
  - Richer intellectual communication
  - Student collaboration around computer –based databases
  - Collaborative problem based learning
  - Focus on those intending to be teachers
  - Links to Uteach
  - Development of modules for middle and high school history classes

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## Transforming Undergraduate Education - conclusion

### Variety of approaches

- Gaming
- New technology
- Core courses
- Large classes
- Rethinking traditional methods
- Focus on at risk students
- Evaluation and assessment

### Next steps

- Project interaction ? Synergy ? – group meeting of innovators
- Project outcomes to be evaluated
- Project outcomes to be shared System – wide
- New funding being sought from Foundations
- New phase of innovations