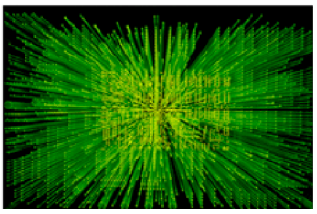
AERA SIGs Learning Science & Advanced Technology for Learning



In 2008 we celebrate the first official year for the Learning Sciences SIG (formerly EST). The new focus is evident in the sessions we are sponsoring this year, which investigate learning across a wide range of innovative environments, through a broad set of theoretical lenses, and using a variety of methodological approaches. Below, we outline plans for the joint LS/ATL business meeting, and provide a schedule and overview of sessions sponsored by the SIGs or otherwise of interest to our members. Please join us for a lively business meeting, and at as many other sessions as you can.

SIG LS/ATL Business Meeting
Tue, Mar 25 - 4:05pm - 7:00pm
New York Marriott Marquis, Westside Ballroom, Salon 2, 5th Floor

We have a double length business meeting this year in order to accommodate a number of presentations as well as time for socializing. We will set up some food and drinks at 4:00pm, and start with SIG business at 5:30. The meeting will feature a discussion of graduate programs with a Learning Sciences emphasis and a presentation of the new Project-Based Inquiry Science curriculum.

SIG Business
- State of the SIG
- Nominations for LS Chair
- Student Paper Awards Presented by Leap Frog Inc.
- Introduction to Sponsors
  - Leap Frog
  - Concord Consortium
  - SRI International
  - UC Davis School of Education

How Will They Find Us? A Guide to Graduate Preparation in the Learning Sciences
Cynthia Carter Ching (University of California, Davis)

Implementing What We Know About Learning in a Middle-School Curriculum for Widespread Dissemination: The Project-Based Inquiry Science (PBIS) Story
Janet L. Kolodner (Georgia Institute of Technology), Mary L. Starr (University of Michigan), Daniel C. Edelson (Northwestern University), Joseph S. Krajcik (University of Michigan), Jennifer M. Leimberer (Northwestern University), Brian J. Reiser (Northwestern University), Michael T. Ryan (Georgia Institute of Technology), Rebecca M. Schneider (University of Toledo), Leeann M. Sutherland (University of Michigan)

Refreshments at the meeting are generously supported by Concord Consortium, SRI International and the School of Education at UC Davis.

SIG LS/ATL Sessions (Overview)

Monday:

Enhancing Mathematics Learning With Technology: Civic, Teacher, Student, and Content Perspectives on Scaling Up SimCalc
Time: Mon, Mar 24 - 2:15pm - 3:45pm
Place: Hilton New York. Murray Hill Suite B, 2nd Floor

Hawkins Award. To See the World in a Shutter Click: A Learner-Centered Approach to Technology in Early Childhood
Time: Mon, Mar 24 - 4:05pm - 5:35pm
Place: Hilton New York, Sutton Complex, Regent Parlor, 2nd Floor

Tuesday:

SIG – SIG ATL & SIG LS Business Meeting
Time: Tue, Mar 25 - 4:05pm - 7:45pm
Place: New York Marriott Marquis Times Square, Westside Ballroom, Salon 2, 5th Floor

Wednesday:

Designing and Investigating Environments for Learning (Roundtables)
Time: Wed, Mar 26 - 8:15am - 8:55am
Place: Hilton New York / Trianon Ballroom/Petit Trianon, 3rd floor

Electronic Learning Environments That Foster Math and Science Professional Development: Design, Facilitation, and Evaluation
Time: Wed, Mar 26 - 8:15am - 10:15am
Place: Hilton New York, Harlem Suite, 4th Floor

Advanced Technology for Learning Discussions (Roundtables)
Time: Wed, Mar 26 - 10:35am - 11:15am
Place: New York Marriott Marquis Times Sq., Broadway Ballroom, Broadway North, 6th Floor

Representational Affordances of Different Modeling and Visualization Tools (MVTs) in Facilitating Student-Centered Science Learning
Time: Wed, Mar 26 - 10:35am - 12:05pm
Place: Hilton New York / Hudson Suite, 4th Floor

Games and Participation: Why Games Matter to Educators
Time: Wed, Mar 26 - 12:25pm - 1:55pm
Place: Hilton New York / Murray Hill Suite A, 2nd Floor

Science and Technology Learning Posters
Time: Wed, Mar 26 - 12:25pm - 1:55pm
Place: Hilton New York, Americas Hall, 3rd Floor

Thursday:

21st-Century Curriculum: Reflexive Play Spaces and the Quest Atlantis Project
Time: Thu, Mar 27 - 12:25pm - 1:55pm
Place: New York Marriott Marquis Times Square, Marquis Ballroom, Salon C, 9th Floor

Current Research on Online Learning
Time: Thu, Mar 27 - 4:05pm - 5:35pm
Place: Hilton New York, Hudson Suite, 4th Floor

Detailed Descriptions of SIG LS/ATL Sessions

Monday:

Enhancing Mathematics Learning With Technology: Civic, Teacher, Student, and Content Perspectives on Scaling Up SimCalc

Time: Mon, Mar 24 - 2:15pm - 3:45pm
Place: Hilton New York. Murray Hill Suite B, 2nd Floor

Chair: Jeremy Roschelle (SRI International)
Discussant: Barry J. Fishman (University of Michigan)
Participants: Bill L. Hopkins (University of Texas - Austin), Jennifer Knudsen (SRI International), Stephen Hegedus (University of Massachusetts - Dartmouth), Theodore Chao (University of Texas - Austin), Philip J. Vahey (SRI International), Nicole Shechtman (SRI International), Susan B. Empson (University of Texas - Austin), Luz A. Maldonado (University of Texas - Austin), Steven Greenstein (University of Texas - Austin), Deborah G. Tatar (Virginia Tech University), Theodore Chao (University of Texas - Austin)

Abstract: The concept of a "geography of opportunity" (see conference theme) neatly captures a central goal of our scaling up research project. The session reports interlocking perspectives from a successful large-scale experiment with SimCalc's integration of curriculum, technology and professional development to introduce more advanced mathematics across varied neighborhoods, schools and regions in Texas. A contextual perspective connects the problem of fitting an intervention to a new state to civic responsibility. A content perspective discusses how the mathematical content, dynamic mathematics environment and assessments of student learning fit together. A student engagement perspective relates differences in student engagement to teaching practices. A teacher perspective looks at how teachers related to the materials and to their students use of the materials.

Hawkins Award. To See the World in a Shutter Click: A Learner-Centered Approach to Technology in Early Childhood

Time: Mon, Mar 24 - 4:05pm - 5:35pm
Place: Hilton New York, Sutton Complex, Regent Parlor, 2nd Floor

Chairs: Rand J. Spiro (Michigan State University), Barry J. Fishman (University of Michigan)
Participants: Cynthia Carter Ching (University of California - Davis), X. Christine Wang (SUNY - Buffalo State College)

Tuesday:

SIG – SIG ATL & SIG LS Business Meeting

Time: Tue, Mar 25 - 4:05pm - 7:45pm
Place: New York Marriott Marquis Times Square, Westside Ballroom, Salon 2, 5th Floor

Wednesday:

Designing and Investigating Environments for Learning (Roundtables)

Time: Wed, Mar 26 - 8:15am - 8:55am
Place: Hilton New York / Trianon Ballroom/Petit Trianon, 3rd floor

Change in Action: Learning and Identity Development in a Youth Apprenticeship
Joseph L. Polman (University of Missouri - St. Louis), Diane Miller (St. Louis Science Center)

Creative Bytes for the Learning Sciences: The Technical, Creative, and Practices of Media Art Production

Kylie A. Peppler (University of California - Los Angeles), Yasmin B. Kafai (University of California - Los Angeles)

Interdisciplinary Collaboration in Educational Technology Design Teams: A Cross-Case Analysis Using the TACIT Framework

Christopher Hoadley (The Pennsylvania State University), Joey John Lee (The Pennsylvania State University), Beth R. Sockman (East Stroudsburg University)

Student Evaluation of Playing and Learning in Multi-User Virtual Environments

Cathleen D. Galas (California Arts Project), Yasmin B. Kafai (University of California - Los Angeles)

Toward a Phenomenology of Mathematical Artifacts: A Circumspective Deconstruction of a Design for the Binomial

Dor Abrahamson (University of California - Berkeley), Michael J. Bryant (University of California - Berkeley), Mark Howison (University of California - Berkeley), Josephine J. Relaford-Doyle (University of California - Berkeley)

Electronic Learning Environments That Foster Math and Science Professional Development: Design, Facilitation, and Evaluation

Time: Wed, Mar 26 - 8:15am - 10:15am
Place: Hilton New York, Harlem Suite, 4th Floor

Chair: Joni K. Falk (TERC)
Discussant: Brian E. Drayton (TERC)
Participants: *Joni K. Falk (TERC), *Brian E. Drayton (TERC), *Wesley Shumar (Drexel University), *Andee Rubin (TERC), *Susan Doubler (Terc), *Rebecca K. Scheckler (Radford University), *Flora McMartin (Broad-based Knowledge)

Abstract: Electronic environments, including electronic communities, digital libraries, online courses and virtual conferences, have become an integral part of the professional development experience for math and science educators. The proposed symposium will present results from 6 different, long-term lines of work in this field, addressing theory and results in relation to the nature of the learning experienced, the structure and development of the communities, the human infrastructure supporting their evolution, and what may be appropriate measures of success. The discussion of commonalities and differences will explore what the field has learned about electronic environments as a locus for professional learning, and open questions for further inquiry and development.

Advanced Technology for Learning Discussions (Roundtables)

Time: Wed, Mar 26 - 10:35am - 11:15am
Place: New York Marriott Marquis Times Sq., Broadway Ballroom, Broadway North, 6th Floor

Mixed Methods For Visual Analysis in Gaming Environments

Joseph C. Dipietro (University of Florida), Erik W. Black (University of Florida)

Technology-Embedded Scientific Inquiry (TESI) Model: Critical Conceptual Considerations

Jazlin Ebenezer (Wayne State University)

The Effects of a Virtual Pet Dog on Children's Development of Empathy

David M. Kaufman (Simon Fraser University), *Lily Tsai (Simon Fraser University), Lucy LeMare (Simon Fraser University)

Representational Affordances of Different Modeling and Visualization Tools (MVTs) in Facilitating Student-Centered Science Learning

Time: Wed, Mar 26 - 10:35am - 12:05pm
Place: Hilton New York / Hudson Suite, 4th Floor

Chair: Baohui Zhang (Nanyang Technological University)
Discussants: Daniel D. Suthers (University of Hawaii - Manoa), Chris Quintana (University of Michigan)

On the Representational and Epistemological Affordances of NetLogo-Based Curricula
Pratim Sengupta (Northwestern University), Uri J. Wilensky (Northwestern University)

Mapping a Model-Based Learning Progression From Genetics to Evolution: Representational Affordances and Epistemological Underpinnings
Janice Gobert (Worcester Polytechnic Institute), *Paul Horwitz (Concord Consortium), *Barbara C. Buckley (Concord Consortium)

Representing System Dynamics With a Learner-Centered Modeling Tool
Baohui Zhang (Nanyang Technological University), *Beaumie Kim (Nanyang Technological University), *Michael J. Jacobson (National Institute of Education - Singapore)

Affordances of 3D Isomorphic Models in Learning of Planetary Motion and Light
Beaumie Kim (Nanyang Technological University), Kenneth E. Hay (Indiana University - Bloomington), Hans Lossman (National Institute of Education - Singapore)

Abstract: Some computer-based modeling tools that have been used for about ten years and are still in use are presented here: Netlogo, Biologica, Model-It, and Astronomicon. The papers analyze the representational affordances of these modeling tools and their impact on student learning of a range of science subjects. The symposium seeks a common framework in guiding the development and integration of modeling and visualization tools (MVTs) in student-centered science inquiry and modeling activities. It intends to explore the general trends in researching and developing the next generation of MVTs.

Games and Participation: Why Games Matter to Educators

Time: Wed, Mar 26 - 12:25pm - 1:55pm
Place: Hilton New York / Murray Hill Suite A, 2nd Floor

Participants: Constance A. Steinkuehler (University of Wisconsin - Madison), Kurt D. Squire (University of Wisconsin - Madison), Sasha A. Barab (Indiana University - Bloomington), Douglas Thomas (University of Southern California)
Discussants: Kylie A. Peppler (University of California - Los Angeles), Eric D. Klopfer (Massachusetts Institute of Technology)

Abstract: Over the past decade, games have emerged as a medium and become regarded seriously as art, culture, and commerce, with important implications for educators. Just as books, film, and television dramatically shifted our culture and social institutions, videogames appear poised to as well. In this session, we will bring together scholars from education, literacy, and communication schools to explore theoretical, design, learning, and methodological questions with respect to games and learning. Each presenter will be asked to focus on games and participation and examine the types of issues and core content that is engaged through game play, with attention to the use of empirical data to justify arguments. Presenters will also focus on how games foster agency and voice.

Science and Technology Learning Posters

Time: Wed, Mar 26 - 12:25pm - 1:55pm
Place: Hilton New York, Americas Hall, 3rd Floor

Computer-Based Life Simulations and Young Adolescents: Identity Exploration, Information Learning, and Sense-Making
Kallen E. Tsikalas (Computers for Youth)

Groupwork as a Complex Adaptive System: a Methodology to Model, Understand, and Design Classroom Strategies for Collaborative Learning
Paulo Blikstein (Northwestern University), *Dor Abrahamson (University of California - Berkeley), Uri J. Wilensky (Northwestern University)

Managing Cognitive Load in Educational Multi-User Virtual Environments: The Spatial Contiguity Design Principle
Brian C. Nelson (Arizona State University), Benjamin Eric Erlandson (Arizona State University)

Teaching and Learning in Second Life: A Self-Study of Using Emerging Technologies in University Teaching
Florence R. Sullivan (University of Massachusetts - Amherst)

Utilizing an Eye Tracking Device to Design Virtual Environments for Individuals With Autism Spectrum Disorder
Sean Goggins (University of Missouri - Columbia), *Jesus Guajardo (University of Missouri - Columbia), *Matthew Schmidt (University of Missouri - Columbia), James M. Laffey (University of Missouri - Columbia), Joi L. Moore (University of Missouri - Columbia)

The Influence of Specific Labels and Diagrammatic Arrows in a Micro-Level Chemistry Animation
David A. Falvo (Delaware State University)

Virtual World, Real Impact: Gender, Race, and the Use of a 3-D Virtual World to Teach Concepts Around Water Quality
Janice L. Anderson (Boston College), Cindy Jong (Boston College), Michael Barnett (Boston College)

Science Internship Experiences in a University Biochemistry Laboratory
Pei-Ling Hsu (University of Victoria), Wolff-Michael Roth (University of Victoria)

The Acquisition of Procedural Skills: An Analysis of the Worked Example Effect Using Animated Demonstrations
Ronald David Lewis (University of South Florida - Tampa), *Ann E. Barron (University of South Florida - Tampa)

The Role of Interjections in Students' Engagement During Science Field Trips
Bruno de Oliveira Jayme (University of Victoria), Lilian Pozzer-Ardenghi (McGill University), Giuliano Pagy Felipe dos Reis (University of Ottawa), Wolff-Michael Roth (University of Victoria)

Thursday:

21st-Century Curriculum: Reflexive Play Spaces and the Quest Atlantis Project

Time: Thu, Mar 27 - 12:25pm - 1:55pm
Place: New York Marriott Marquis Times Square, Marquis Ballroom, Salon C, 9th Floor

Participants: Sasha A. Barab, Daniel T. Hickey, Melissa Sommerfeld Gresalfi, Adam Ingram-Goble, Tyler Dodge, Sinem Siyahhan, Timothy Reilly, Kenneth E. Hay (Indiana University - Bloomington), Steven J. Zuiker (National Institute of Education - Singapore)

Discussants: Michael F. Young (University of Connecticut), Linda G. Polin (Pepperdine University)

Abstract: In translating game design methodologies and technologies to a curricular context, we have been evolving a design theory around what constitutes a reflexive play space in relation to the design of a multi-user virtual environment known as Quest Atlantis, which has been used by over 5,000 children world-wide. In our description, a reflexive play space is a curricular context that (a) aims to support conceptual engagement within (b) a dynamic narrative context (c) that changes in response to user actions and (d) that provides opportunities to examine one's participation in relation to the impact of one's choices on the narrative context. Drawing on empirical data and implemented designs, we will present four different projects situated in the Quest Atlantis context.

Current Research on Online Learning

Time: Thu, Mar 27 - 4:05pm - 5:35pm
Place: Hilton New York, Hudson Suite, 4th Floor

Chair: Jody S. Underwood (ETS)
Discussant: Kenneth E. Hay (Indiana University - Bloomington)

A Pilot Study on the Design Effectiveness of a New Distance Learning System
Cindy S. York (Purdue University), *Melissa J. Dark (Purdue University), *Dazhi Yang (Purdue University), Voicu Popescu (Purdue University), Cristina Nita-Rotaru (Purdue University)

Networked Teachable Agents and Automated Feedback
Doris B. Chin (Stanford University), Brian Lukoff (Stanford University), Girija Mittagunta (Stanford University), Henry Kwong (Stanford University), Daniel L. Schwartz (Stanford University)

Scaffold Student Learning in a Web-Based Tutoring Environment
Young-Jin Lee (The University of Kansas), David Pritchard (Massachusetts Institute of Technology)

The Evaluation of Student Feedback in the Enhancement of Online Collaborative Activities
Halit Turgay Unalan (Anadolu University)

Sequentially Analyzing and Mapping the Interactional Processes of Knowledge Construction in Online Learning
Allan Jeong (Florida State University)