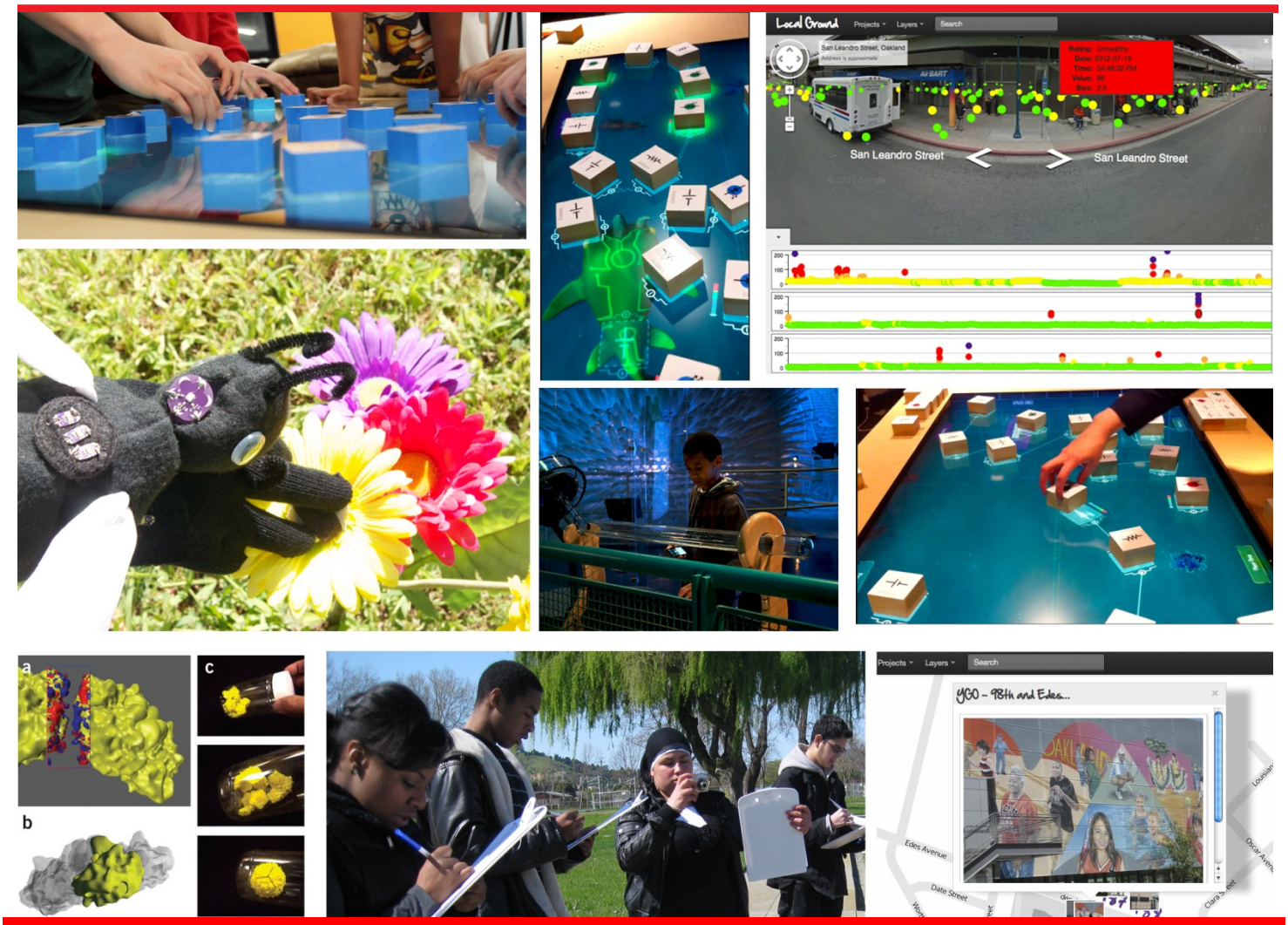
Cyber Learning

The Center for
Innovative Research in Cyberlearning
(CIRCL)



2014 CyberLearning Summit

June 9th – 10th, 2014

Memorial Union, University of Wisconsin-Madison

Madison, WI

SRI International

NSF

EDC Learning transforms lives.

The Center for
Innovative Research in Cyberlearning
(CIRCL)

2014 Cyberlearning Summit

June 9-10, 2014
Madison, WI

Welcome to the 2014 Cyberlearning Summit!

Sunday, June 8th, 2014
Birds of a Feather Dinner (self-pay) at local restaurants. Meet outside Great Hall at 6pm.

Event Logistics, Materials, Virtual Participation
http://circlcenter.org/events/cyberlearning-summit-2014/

Webcast Registration
http://learningtimesevents.org/circl/

Wireless Internet Access (Meeting Space)
Log-in: tmp-cyber
Password: dJ$aH9

Acknowledgments

Summit Chair
Sherry Hsi (Lawrence Hall of Science, UC Berkeley)

Summit Co-Chairs
Jeremy Roschelle (SRI International)
Sarita Pillai (EDC, Inc.)

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Program Cover - Collage Photo Credits
BioSim Bee Puppet: Kylie Peppler, Indiana University
Blocks/Table: Marianne Spoon, University of Wisconsin
Computer Science students: Roy Kaltschmidt, Lawrence Berkeley National Lab
Students in field: Tapan Parikh, UC Berkeley
Museum photo/Zydeco: Christopher Quintana, University of Michigan
Yellow molecules: Jodi Davenport, WestEd

2014 Cyberlearning Summit – Monday June 9th, 2014

Day	Time	Activity	Purpose
DAY 1 – Monday, June 9th	7:30-9:00	**Breakfast** (Great Hall) **Registration** (Main Lounge)	**Register for meeting, get acquainted, set-up posters, set-up and test demos**
	9:00–9:25	**Summit Starts** (Great Hall)	**Welcome and Opening Remarks** **Welcome from GLS by Kurt Squire** **Special Introductions** **Agenda & Game Overview**
	9:25-9:50	**Speed Networking** (Great Hall)	**Speed Networking** Describe your program/research to the person across from you: Round 1: Name, Org, Mission, Activities, Resources to Share/Take Round 2: Most impactful example of cyberlearning you've seen Round 3: Favorite place to learn something new
	9:50–10:00	**Second Welcome** (Great Hall)	**Welcome Online Audience**
	10:00-11:15	**Strand 1 - Role of Teachers in Cyber-enabled Classrooms** (Great Hall)	• **The Scalable Architecture for Interactive Learning (SAIL): An Extensible Framework for Distributed and Collective Forms of Inquiry** (Jim Slotta) • **STEMGenetics: Teachers Growing Future Scientists** (Michelle Williams) • **Mini-cloud for Online Biology Experimentation and Learning Analytics** (Ingmar Riedel-Kruse) • **Connecting Young People's Expressive Activities with the Tools of Math and Science** (Michelle Hoda Wilkerson-Jerde) • **What We Know and Don't Know About the Use of Simulations and Games for STEM Learning in the Classroom** (Cynthia D'Angelo) • **Q & A**
	11:15–11:30	BREAK	
	11:30–12:00	**Poster Preview** (Great Hall)	**Poster Session Preview** • **Using the VideoMosaic Repository for Creating Multimedia Artifacts for the VMCAnalytic** (Cindy Hmelo-Silver) • **Studying Implicit Science Learning in Digital Games** (Elizabeth Rowe) • **Earthquake Rebuild: Math Learning through Modeling and Design (**Fengfeng Ke) • **Connected Learning and STEM Pathways: The Development of Identity, Interest, and Information Literacy** (June Ahn) • **The WeatherBlur Platform: Co-creating an Online Learning Community** (Ruth Kermish-Allen) • **Initial Version of FUN! Tool** (Taylor Martin & Deborah Fields)

Day	Time	Activity	Purpose
	12:00-2:00	**Posters** (Tripp Commons)	Lunch
	2:15-3:45	**Strand 2 – Playful Environments** (Great Hall)	• **Aggregating Collaborations for Informal Learning** (Leilah Lyons) • **Local Ground: Supporting Data-Driven Youth Community Inquiry** (Tapan Parikh) • **A New Generation of Learning Games** (Dan White) • **Mindstorms 2.0: Programming and Play in Powerful Networks** (Yasmin Kafai) • **Cities of Learning: Increasing STEM Participation through Neighborhood Identity Building** (Nichole Pinkard) • **Q & A**
	3:45 – 4:15	Break & Set-up for Technology Demos	
	4:15 – 6:00	**Demo Festival** (Tripp Commons)	**Technology Demos and Light Appetizers** 1. **CTSiM - Computational Thinking through Simulation and Modeling** (Gautam Biswas) 2. **In Touch with Molecules: Learning Biology with Origami, Magnets and Augmented Reality** (Jodi Davenport) 3. **Integrating Mobile Observation Tools within an Immersive, Room-Sized Simulation: New Supports for Science Inquiry** (Jim Slotta, Michelle Lui, Chris Quintana) 4. **InquirySpace, CODAP and Learning with Graphs** (Chad Dorsey) 5. **Turn Up the Heat!** (Michael Horn) 6. **Build-a-Tree: A Phylogenetic Puzzle Game** (Michael Horn) 7. **Thermogame: A Playful 3D Simulation for Engineering Education** (David Gagnon, John Pfotenhauer) 8. **BioSim: A Participatory Simulation** (Kylie Peppler) 9. **Craft Technologies 101** (Deborah Fields) 10. **CyGaMEs Metaphorics – Instructional Games that Work…the Way the Mind Does** (Debbie Denise Reese) 11. **Games, Learning and Society Unleash the EcoNauts** – (Robert Bohanan, Paul Olson)
	Evening	Free Time – See “Things to do” in Madison!	

Plenary Sessions (Webcast)	Free/Networking Time	Working Group Sessions	Plenary sessions (No Webcast)

2014 Cyberlearning Summit – Tuesday, June 10th, 2014

Day	Time	Activity	Purpose
DAY 2 – Tuesday, June 10th	7:30-8:30	**Breakfast** (Great Hall) **Registration** (Main Lounge)	**Late Registrations**
	8:30–9:45	**Joint Keynote with GLS Playful Learning** (Great Hall)	• **Opening Comments** (Kurt Kiefer, Assistant State Superintendent at the Wisconsin Department of Public Instruction) • **Keynote** (Deborah Fields and Yasmin Kafai) • **About CIRCL** (Jeremy Roschelle)
	9:45–10:00	BREAK	
	10:00-11:30	**Strand 3 – Deep Learning** (Great Hall)	• **Citizen Science Journalism** (Joe Polman) • **Developing Computation as Practice in K-12 Science Classrooms** (Pratim Sengupta) • **Human-Technology Partnership in Facilitation of Discursive Instruction** (Carolyn Rosé) • **Using Log Files, Eye Tracking, and Computation Techniques for the Development of Next Generation Learning Environments** (Janice Gobert) • **Affect-Aware Cyberlearning Technologies for Deep Learning** (Sidney D'Mello) • **Q & A**
	11:30–12:00	Transition to groups & box lunch	
	12:00– 1:45	**Working Session** (Various)	**Synthesis & Integration Groups** • **Planning Proposals** • **GLS Doctoral Consortium** • **Conference and Journal Submissions** • **Getting to Know Each Other/Perspectives** • **TBD**
	2:00-2:45	**Partnering for Impact Panel** (Great Hall)	Janice Gobert, Natalie Harr, Michael Jay, Joyce Malyn-Smith, Rajiv Ramnath Moderator: Jeremy Roschelle
	2:45-3:00	BREAK + Announce game winners	
	3:00-3:45	**Reflectors Panel** (Great Hall)	Barbara Means, Darrell Porcello, Elliott Soloway, Stephanie Teasley Moderator: Barry Fishman
	3:45-4:00	**Closing Remarks**	NSF/CIRCL

Plenary Sessions (Webcast)	Free/Networking Time	Working Group Sessions	Plenary sessions (No Webcast)

Summit Speakers

Cynthia D'Angelo
SRI International

Cynthia D'Angelo, Ph.D., is a researcher specializing in science education, simulations, games, and learning. She is interested in how we can leverage data gathered through online technologies to better understand how it is that students learn STEM concepts and practices. She has a background in physics and science education.

Sidney D'Mello
University of Notre Dame

Sidney D'Mello is an Assistant Professor in Computer Science and Psychology at the University of Notre Dame. His interests include affective computing, artificial intelligence in education, human-computer interaction, natural language understanding, and computational models of human cognition. D'Mello received his Ph.D. in Computer Science from the University of Memphis in 2009.

Janice Gobert
Worcester Polytechnic Institute

Janice Gobert (Ph.D., U. of Toronto, 1994) is an Associate Professor of Learning Sciences and Psychology and the Co-director of the Learning Sciences and Technologies Program at WPI. Her specialty is in simulation-based learning and assessment in science via log files and data mining, and intelligent tutoring systems for science.

Natalie Harr
National Science Foundation
Natalie has been an early childhood educator for nine years. She has specifically worked to promote STEM (science, technology, engineering, mathematics) education in the early grades. In addition to teaching, she has served as a researcher/educational outreach coordinator at Palmer Station, Antarctica and has published several articles on science and learning.

Michael Jay
Educational Systemics

Michael Jay, a long time educator and President of Educational Systemics, Inc. creates lasting change in how we learn and educate through work with organizations that serve pK-12 education. His diverse expertise includes educational and corporate leadership, market analysis, product development, instructional design, and tested knowledge of all facets of K-12 education. His work combines a vision that generates success for education organizations while advancing quality education. Michael is in his third year of chairing the AAP Content in Context (CIC) conference. He and his organization have considerable experience in using metadata to describe and manage instructional assets, data interoperability, market analysis, and business strategy.

Yasmin Kafai
University of Pennsylvania

Yasmin Kafai is Professor of Learning Sciences at the University of Pennsylvania. She is a researcher, designer, and co-developer of online tools and communities (scratch.mit.edu, stitchtfest.org, and ecrafting.org) to promote computational participation, crafting, and creativity across K-16. Her book publications include Connected Code, Computer Clubhouse, Textile Messages, and Beyond Barbie and Mortal Kombat. Kafai earned a doctorate from Harvard University while working with Seymour Papert at the MIT Media Lab. She is an elected Fellow of the American Educational Research Association and a past President of the International Society for the Learning Sciences.

Leilah Lyons
University of Illinois at Chicago, Illinois & NYSCI

Dr. Leilah Lyons conducts research at the intersection of human-computer interaction and the learning sciences, partnering with domain specialists and informal educators to innovatively apply human-computer interaction techniques to introduce learners to STEM topics. She is both an assistant professor at the University of Illinois in Chicago in the Learning Sciences Research Institute as well as the Director of Digital Learning Research at the New York Hall of Science (NYSCI). She is the PI of the NSF INSPIRE grant "Studying and Promoting Quantitative and Spatial Reasoning with Complex Visual Data Across School, Museum, and Web-Media Contexts." Dr. Lyons earned her Computer Science Ph.D. and Museum Studies Certificate from the University of Michigan.

Joyce Malyn-Smith
Education Development Center, Inc.

Joyce Malyn-Smith leads a body of work focusing on how individuals develop knowledge and technology skills in formal and informal settings, then translate those into productive and rewarding careers. She served NSF as PI for 7 projects, the Department of Education as lead for the IT Career Cluster, and Boston Public Schools as a teacher & administrator.

Barbara Means
SRI International

Barbara Means, Ph.D., is director of the Center for Technology in Learning at SRI International. She is an educational psychologist whose research focuses on ways in which technology can support students' learning of advanced skills and the revitalization of classrooms and schools. Recently named as a fellow of the American Educational Research Association, Means is regarded as a leader in defining issues and approaches for evaluating the implementation and efficacy of technology-supported educational innovations.

Tapan Parikh
University of California at Berkeley

Tapan Parikh is an Assistant Professor at the School of Information at the University of California, Berkeley. Tapan's research interests include human-computer interaction (HCI), mobile computing, paper and voice UIs and information systems for microfinance, smallholder agriculture, global health and education. He holds a Sc.B. degree in Molecular Modeling with Honors from Brown University, and M.S. and Ph.D. degrees in Computer Science from the University of Washington, where his dissertation won the William Chan Memorial award.

Nichole Pinkard
DePaul University

Nichole Pinkard is an Associate professor at DePaul University focused on the design, development, and implementation of blended learning environments to support youth development of 21st century literacies across formal and informal contexts. She is also the Founder and Director of the Digital Youth Network launched on Chicagos South Side to engage low-income students in the production of and participation with digital media. She is the PI of the NSF RAPID project that is creating an approach for tracking STEM program participation among young people by using youth's badging and online participation histories. With Co-PI Denise Nacu, she is the PI of an NSF Cyberlearning DIP project that focuses on designing "blended learning" environments and helping teachers take on and learn to productively use digital technologies in their classrooms to help students learn disciplinary content, disciplinary skills, and the many communication, collaboration, and inquiry skills so important to their futures.

Joseph Polman
University of Colorado at Boulder

Joe received his B.A. in Comparative Literature from Brown University and Ph.D. in Learning Sciences from Northwestern University. He designs and studies technology-supported inquiry learning environments in schools and community-based programs. He focuses on learning and identity connected to the disciplines of science and history, and the professional practices of journalism.

Darrell Porcello
Lawrence Hall of Science, University of California at Berkeley

Darrell Porcello is the Chief Technology Officer of the Lawrence Hall of Science at UC Berkeley, and leads the Center for Technology Innovation. His group consists of technical project managers, developers, graphic designers, science educators, and learning scientists, all committed to producing high quality, effective, and research-driven educational technology products.

Rajiv Ramnath
Ohio State University

Rajiv Ramnath is Associate Professor of Practice in Computer Science and Engineering, Director of the Collaborative for Enterprise Transformation and Innovation (SETI), and an evangelist for AweSim (www.awesim.org). Dr. Ramnath received his Doctorate and Master's degrees in Computer Science from OSU and his Bachelor's degree in Electrical Engineering from IIT Delhi.

Ingmar Riedel-Kruse
Stanford University

Ingmar Reidel-Fruse is an Assistant Professor in Bioengineering at Stanford University School of Medicine and Engineering. With Co-PI Paolo Blikstein, he is the PI of a Cyberlearning: Transforming Education DIP project that is building and evaluating a technological and curricular infrastructure to empower scalable, low-cost experimentations for undergraduates and K-12 students in the life sciences. With research interest in interactive biophysics and programming of multicellular systems, the Riedel-Kruse Lab combines experiments and theory to understand the dynamics and biophysics of multicellular systems (such as animal development or biofilms); and engineers platforms that enable open-ended interactions with microbiological systems (such as true online labs and biotic games) for education and learning analytics.

Carolyn Rosé
Carnegie Mellon University

Dr. Carolyn Rosé is an Associate Professor of Language Technologies and Human-Computer Interaction in the School of Computer Science at Carnegie Mellon University. Her research program is focused on better understanding the social and pragmatic nature of conversation, and using this understanding to build computational systems that can improve the efficacy of conversation between people, and between people and computers. In order to pursue these goals, she invokes approaches from computational discourse analysis and text mining, conversational agents, and computer supported collaborative learning. She serves on the Board of Directors of the International Society of the Learning Sciences and the Executive Board of the International Artificial Intelligence in Education Society. She serves as Associate Editor of the International Journal of Computer Supported Collaborative Learning and the IEEE Transactions on Learning Technologies.

Pratim Sengupta
Vanderbilt University

Pratim is an Assistant Professor of Learning Sciences at Vanderbilt University. His primary research, supported by an NSF CAREER award, focuses on the design, development and curricular integration of agent-based computational programming and modeling in K-12 STEM. He is passionate about supporting long-term development of generative representational practices in children. An avid modeler, he also collaboratively builds models of non-linear phenomena diverse domains - political economy, art, environmental engineering, etc. – including a crowdsourced model of artist networks that was exhibited at the MoMA, NYC.

Jim Slotta
University of Toronto

Jim Slotta is an Associate Professor of education at The University of Toronto, where he holds the Canada Research Chair in Education and Technology and directs the ENCORE lab (http://encorelab.org) - a team of talented students, designers and developers who investigate collaborative inquiry in smart classrooms and distributed technology environments.

Elliot Soloway
University of Michigan

Elliot Soloway is Arthur F. Thurnau Professor at the Department of CSE, College of Engineering, University of Michigan. For 15 years, Elliot's research has been guided by the vision that mobile, handheld – and very low-cost – networked devices are the only way to truly achieve universal one to one in schools – all across the globe.

Stephanie Teasley
University of Michigan

Stephanie Teasley, Ph.D., is a Research Professor in the School of Information at the University of Michigan. She is also the Director of the USE Lab- a community of scholars who investigate how information technologies and digital media are used to innovate teaching, learning, and collaboration. Her work has been funded by the NIH, NSF, the Bill & Melinda Gates Foundation and the MacArthur Foundation She is on the Executive Board of the Society for Research on Learning Analytics (SoLAR). Her current work focuses on how Learning Analytics can be used in higher education to improve every students' learning experience.

Dan White
Filament Games

Dan White is a founding partner and Executive Producer at Filament Games, where he directs both business and development operations. White earned an M.S. in Educational Communications and Technology from the University of Wisconsin – Madison and a B.S. in Communication Technologies from Cornell University. During his tenure at UW, Dan worked with leading games and education researchers, Dr. Kurt Squire and Dr. James Gee. He helped create the most popular game called "Do I Have a Right?" about constitutional rights as part of the game iCivics, the brainchild of retired U.S. Supreme Court Justice Sandra Day O'Connor. Previously, White worked as a Producer on the Cornell Theory Center's NSF-funded SciCentr Project, a series of innovative online virtual worlds for informal science and technology outreach. White serves on the advisory board for Games for Change and is a founding member of the GLS (Games Learning Society) organization at UW-Madison.

Michelle Wilkerson-Jerde
Tufts University

Michelle Wilkerson-Jerde is an assistant professor of Education at Tufts University. She studies how young people reason about complex and data-intensive systems, and how they adopt and make use of computational tools to support such reasoning. As part of this work, Michelle designs and studies toolkits that connect familiar expressive activities such as sketching or storytelling with the formal tools of computation, mathematics and science. With Co-PI Brian Gravel, she is PI of SiMSAM, an NSF Cyberlearning EXP project to develop and explore the pedagogical potential of an integrated stop-motion animation, computational simulation, and data analysis tool. In 2014 she was awarded an NSF CAREER grant to study middle school students' data visualization competencies, including through the development and study of DataSketch, a programmable tablet-based dataviz sketchbook.

Michelle Williams
Michigan State University

Michelle Williams' research interests center on student learning and teaching in science education. Her work combines inquiry learning with the topic of genetics and uses a technology-enhanced learning environment to take advantage of research in the learning sciences to improve scientific literacy among precollege students. Williams' work also involves exploring the relationships between students' learning outcomes and teachers' classroom practices.

PRESENTATIONS

Strand 1 - Role of Teachers in Cyber-enabled Classrooms

The Scalable Architecture for Interactive Learning (SAIL): An Extensible Framework for Distributed and Collective Forms of Inquiry

Jim Slotta, University of Toronto

This talk will present a cyberlearning infrastructure called SAIL, the Scalable Architecture for Interactive Learning. SAIL enables distributed learning, where students engage in sustained sequences of inquiry activities across learning contexts and environments. It also supports collective inquiry, where students engage as a learning community to create a knowledge base that advances their understandings and serves as a resource for further inquiry. SAIL has been created over the past decade with funding from U.S. and Canadian national science foundations. It is currently supporting research in three NSF-funded projects, including a Cyberlearning project in which students are engaged in tangible and embodied interactions within richly instrumented learning environments. The presentation will draw on examples from several research projects, including an immersive room-sized simulation of a Sumatran rainforest, a "smart classroom" for physics problem solving, and the use of dynamic, aggregate representations for collective inquiry about embedded phenomena in an elementary classroom.

STEMGenetics: Teachers Growing Future Scientists

Michelle Williams, Michigan State University

Genetics is an extremely relevant topic in our changing global society. In issues relating to genetic modification and gene therapy, among other things, understanding genetics plays a vital role in everyday health-related decision-making. While previous research has largely focused on older students' understandings of this topic, relatively little has explored the genetics-related conceptions of younger students. In this presentation, I will explore the use of learning technologies for helping students make sense of genetics in the most effective way possible. Additionally, I will discuss ways in which teachers can develop best practices for using these learning technologies to monitor and assess student learning. In particular, this presentation is informed by the use of the STEMGenetics curriculum model, which utilizes an open-source, interactive learning platform that allow teachers to assess student progress as they work through the curriculum together. Having a powerful curriculum model is needed to support both teachers and students in deeper classroom learning with technology.

Mini-cloud for Online Biology Experimentation and Learning Analytics

Ingmar Riedel-Kruse, Stanford University

We developed multiple cloud experimentation platforms that represent a new paradigm for online learning by enabling multiple students in parallel to carry out biology experiments over the web. The different platforms address different scales and biology questions (such as experiments lasting one

minute vs. multiple days, what biological material to use, etc.). We used one of these platforms (a LEGO-based mini-cloud that enables to study the chemotaxis response of the slime mold physarum) throughout a Stanford biophysics graduate class and performed a user test study. Students executed guided and open ended "biology cloud experiments". The system demonstrated not only its utility as an effective educational tool, but the potential for students to make genuine biological discoveries. Hence the system could even be used to "train" scientists as it enables true open-ended discovery and exploration over the web. We also logged all user data, and also interviewed the students. Analysis of this data enabled us to identify different behavioral types of how students approach experimentation hence this type of platforms can be effective for learning research.

Connecting Young People's Expressive Activities with the Tools of Math and Science

Michelle Hoda Wilkerson-Jerde, Tufts University

To prepare an informed citizenry and broaden participation in STEM disciplines, educators must balance two related goals. Students should learn that disciplines like science or statistics involve specialized tools and careful practices. And, students should recognize that they have access to those tools and practices to explore their own ideas and make new contributions. I argue one way we can support both of these goals is by bridging familiar forms of personal expression–like storytelling, drawing, or animation–with specialized forms like data visualization or computational simulation. To illustrate, I will describe SiMSAM, a constructionist toolkit that integrates stop-motion animation, computational simulation, and data analysis for scientific modeling in middle school. With careful support and facilitation, learners using SiMSAM create increasingly explanatory and predictive scientific models, exercise ownership over their models, and come to recognize the specialized ways computational simulation enables them to express, test, and share ideas.

What We Know and Don't Know About the Use of Simulations and Games for STEM Learning in the Classroom

Cynthia D'Angelo, SRI International

Simulations and games are being used in many classrooms to help students learn. But what does research say about how well students can learn with and in these kinds of technology-enhanced learning environments? Results from two recent meta-analyses on simulations and games for learning will be presented, looking at what we currently know about simulations and games and what we still don't know (and why). Both simulations and games proved to be effective in promoting student learning, although certain design features and implementation details moderated this effect. Designing and conducting appropriate studies to measure student learning in complex digital environments such as simulations and games will require a lot of effort from the field but should ultimately be worthwhile.

Strand 2 - Playful Learning Environments

Aggregating Collaborations for Informal Learning

Leilah Lyons, University of Illinois at Chicago & NYSCI

Informal learning is a term often applied to anything that doesn't look like what happens in a traditional classroom. Museums, zoos, neighborhood planning meetings, hobbyist clubs – these settings share little except that the learners are there by free choice. Research shows that we often learn best when we can make choices in our explorations of problem spaces, but giving learners choices poses particular challenges for designers of computer-based learning experiences. Ideally, designers should give learners control over choices that affect outcomes in which learners have some interest or investment. The presence of multiple learners can complicate the distribution of control, however, as learners may make choices that interfere with their companion's choices. While conflict can be productive for learning, it can also engender negative emotions that run counter to the social experiences many informal learners are seeking out. The research presented here examines an alternative model for distributing control amongst multiple informal learners: aggregational control. Under an aggregational control scheme, each learner makes choices that contribute to a shared experience, but their actions do not disenfranchise their companions. Designs that support aggregational control, and the opportunities they provide, are highlighted across a number of projects in different informal learning settings.

Local Ground: Supporting Data-Driven Youth Community Inquiry

Tapan Parikh, UC Berkeley

Local Ground is a data collection, mapping and information visualization tool that helps youth develop data skills by making connections between different representations of empirical phenomena. Students begin by collecting open-ended qualitative data, in the form of free-hand drawings, pictures and audio interviews. Based on these observations, students can design of structured data collection instruments for more systematic inquiry and analysis. These various forms of data are combined into narratives that can articulate youth perspectives to a variety of stakeholders. In collaboration with various community partners, Local Ground has been used to involve youth the planning of a public park, ground-truth civic data about food access, and document air quality issues across the BART transportation system. In this talk, I will describe the design of the system, the results of several case studies and some motivating research questions for the future.

A New Generation of Learning Games

Dan White, Filament Games

We all have fond memories of *Oregon Trail*, and we can all agree that things have been slow to evolve in the time since. Fortunately, the industry is about to get a fresh coat of paint. Learning games are back with a vengeance, and there's a lot to be excited about. This talk will share a new generation of learning games, why they work, how they're made, what they look like in 2014 and when they'll return to prominence!

Mindstorms 2.0: Programming and Play in Powerful Networks

Yasmin Kafai, University of Pennsylvania

More than 30 years ago, Seymour Papert proposed in *Mindstorms* a radical vision of how children could program computers for learning. Today we are witnessing a remarkable comeback of computer programming. With computers accessible everywhere, particularly outside school, millions of children and youth are connecting to wider networks of other young users, and coding is about not just computational thinking but also computational participation, for making more meaningful connections online. Mindstorms 2.0 promotes a vision that has children program games, stories and animations for others; that uses the emergence of youth design communities as models for collaborative learning environments; that discusses the practices and ethical challenges of remixing (rather than starting from scratch) as ways to introduce coding; and that moves coding beyond stationary screens to tangible materials to broadening computational participation and play for all.

Cities of Learning: Increasing STEM Participation through Neighborhood Identity Building

Nichole Pinkard, DePaul University

Each summer many youth experience summer learning loss due in some measure to the lack of academically oriented summer programming in which they participate. This lack of participation can be due to factors such as programming costs, transportation, awareness, and/or interest. The summer learning loss is most dramatic for underrepresented youth for whom continual limited STEM summer informal learning participation greatly contributes to their underrepresentation in STEM majors in college. In this talk I will discuss a design research approach that combines social learning design patterns, online STEM learning activities, online mentors, and learning analytics to create a hybrid game that challenges youth to complete online and face-to-face STEM activities in pursuit of helping their neighborhood level up in a citywide Chicago City of Learning Neighborhood challenge. We hypothesize that our approach of situating STEM learning within a social gaming context (i.e. help my neighborhood) while providing each child a personalized list of recommended STEM activities informed by the child's demographics, participation patterns, badge portfolio, and the participation patterns of other youth in their neighborhood can provide insights into how to sequence learning opportunities in ways conducive to increasing youth STEM participation.

Strand 3 - Deep Learning

Citizen Science Journalism

Joseph Polman, University of Colorado at Boulder

"Citizen science" is a growing trend, generating enthusiasm as well as considerable research and development in the science education community. In this presentation, I will describe an emerging network of youth and educators involved in "citizen science journalism." Rather than public participation in scientific research, citizen science journalism engages the public in science communication. We have found that youth increase their science literacy when they research and craft science news stories and infographics to be considered for publication in an authentic and rigorously edited publication. In this presentation, I will discuss the design of a sociotechnical system spanning schools and out-of-school programs that supports learning and engagement with STEM through journalism. This includes contextualizing science in life by combining personal, scientific, and societal concerns; the provision of peer and editor feedback; critical consideration of the functional credibility of web-based sources; and youth designing multimodal representations of data and ideas.

Developing Computation as Practice in K-12 Science Classrooms

Pratim Sengupta, Vanderbilt University

It has been long argued that integration of computational modeling in science classrooms can foster conditions for authentic scientific inquiry. In fact, many researchers have developed agent-based computational modeling and programming languages for young children, that can teach very powerful concepts in both and programming to relatively young learners. However, the integration of these tools in authentic classroom settings has received little (if any) attention. In this talk, I present findings from two NSF projects, that address the issue of classroom integration along multiple dimensions for elementary and middle school science classrooms:

1. What are implications for the design of agent-based programming languages for integration in science classrooms?
2. What are the implications for the curricular design (i.e., design of learning activities)?
3. What does effective classroom instruction for teaching in such learning environments look like?

Human-Technology Partnership in Facilitation of Discursive Instruction

Carolyn Penstein Rosé, Carnegie Mellon University

A challenge of learning at scale is meeting the massive support demands while considering limitations on instructor capacity. An under-utilized resource is the students themselves. A decade of research shows that students benefit from interactions in learning groups when interactive and context sensitive support is provided. We have adapted teacher facilitation techniques for use in collaborative learning interventions that use intelligent software agents triggered by automated analyses of collaborative discussions in real time to provide discussion facilitation. In addition to the positive local effect of improved collaboration and increased pre to post-test gains on small groups of collaborating students,

we see that students who have experienced a supported small group collaboration experience bring the positive effect back to whole class teacher led discussion. This result suggests that technology for supporting small group collaboration may extend the reach of the support capacity of instructors in learning at scale.

Using Log Files, Eye Tracking, and Computation Techniques for the Development of Next Generation Learning Environments

Janice Gobert, Worcester Polytechnic Institute

Recent frameworks for K-12 Science education (NRC, 2013) call for authentic science practices that are richly integrated with content knowledge, in turn, permitting transfer. The framework states that what is needed is ***rigorous knowledge*** about learning processes and ***better assessments*** of these. The design of many current science learning environments attempts to address these issues; such systems log all students' interactions within the system and if fully leveraged, these can provide assessment of and feedback on students' inquiry skills. Our group (http://slinq.org) has developed such a system called Inq-ITS, which assesses and assists students in real time as they conduct inquiry with scientific microworlds. Based on educational data mining and knowledge engineering on log files, the system provides assessment reports to teachers on students' inquiry skills as well as provides feedback to students via our pedagogical agent. These algorithms have also been shown to be generalizable across many topics.

Affect-Aware Cyberlearning Technologies for Deep Learning

Sidney D'Mello, University of Notre Dame

Deep learning is inherently an emotionally rich experience as learning events elicit a range of positive and negative emotions, which in turn, modulate cognition in striking ways. Hence, a deeper understanding of emotion-cognition relationships is needed to develop next-generation cyberlearning technologies that help students learn in a manner that is optimally coordinated with their emotions. We have been developing several such systems over the last decade. This talk will provide examples of two such systems. The first is a learning environment that promotes learning by automatically sensing and responding to boredom, frustration, and other negative emotions. Taking a somewhat different approach, the second system helps students' develop critical thinking skills by inducing cognitive disequilibrium in order to inspire deeper processing. Recent efforts to expand the bandwidth of affect-aware cyberlearning technologies by incorporating models of mind wandering as well as affect-aware educational games will be discussed.

POSTER SESSIONS

1) Using the VideoMosaic Repository for Creating Multimedia Artifacts with the VMCAnalytic

Cindy Hmelo-Silver[1], Carolyn Maher[2], Marjory Palius[2], Robert Sigley[2]
[1]Indiana University, [2]Rutgers University

Video is an important resource for understanding how students learn and how teachers recognize the details of student learning. In the Video Mosaic Collaborative (videomosaic.org), we provide opportunities for teaching and learning through the use of a cyber-enabled video repository that offers resources for the creation of multimedia artifacts, the VMCAnalytic. This builds on longitudinal research conducted over the last 25 years to examine the development of mathematical reasoning from elementary grades through high school and beyond. The research has produced over 4500 hours of video and related metadata, a subset of which is currently stored and available on the open-access Video Mosaic Repository (VMC) at Rutgers University. These artifacts enable new forms of scholarly production for students across disciplines. Our poster will present several examples of VMCAnalytics from Mathematics Education and the Learning Sciences.

2) Studying Implicit Science Learning in Digital Games

Elizabeth Rowe[1], Jodi Asbell-Clarke[1] & Ryan Baker[2]
[1]Educational Gaming Environments (EdGE) group @ TERC, [2]Teachers College, Columbia University

Games have become a powerful tool for learning; one of their strengths is that they can promote implicit learning, so that a player may not even realize that they are engaging with academic content. This poster will describe how researchers use data logged from the game *Impulse* to study players' implicit science learning, as manifested by the strategies players develop to deal with Newtonian behaviors of particles. Through video analysis of 70 high school players, EdGE researchers coded strategies and linked those codes to the game log data. Independent coders were able to replicate the coding of 10 videos with Kappas exceeding 0.70 for constructs related to implicit science learning. Researchers are currently mining game log data to build automated detectors of these strategies using classifiers and student-level cross-validation methods. With these detectors, we will identify common player strategies and how strategies are deployed based on the game state.

3) Earthquake Rebuild: Math Learning through Modeling and Design

Fengfeng Ke, Valerie Shute, Gordon Erlebacher, Kathleen Clark, Matthew Ventura
Florida State University

This poster presents the preliminary findings of an ongoing, design-based research project that examines how participating in architectural design and modeling via an architecture simulation game will involve middle-school students in an integrated and active learning of mathematics. In particular, we will report the design conceptualizations, prototypes, and design-based functional specifications of Earthquake Rebuild, a 3D architecture game that promotes versatile representations and epistemic practices of mathematics in design and building quests. The first-year data of this longitudinal design research were collected via observation, semi-structured interviewing, and think-aloud protocol during

iterative expert reviews and the user testing of the game prototypes. Besides design narratives and contextually-defined design generalizations, the poster also presents phenomenological research findings on the interdisciplinary design collaboration among experts of diverse fields (e.g., education, architecture, and scientific computing) for the learning game development.

4) Connected Learning and STEM Pathways: The Development of Identity, Interest, and Information Literacy

June Ahn, Mega Subramaniam, Amanda Waugh, Anthony Pellicone, Jinyoung Kim, Elizabeth Bonsignore
University of Maryland, College Park

Sci-Dentity is a Cyberlearning EXP project where we developed and implemented after-school programs in public school libraries within inner-city Washington, DC. The program engages middle school students in science fiction storytelling using social media and other new media technologies. We worked with and followed a cohort of students for 3 years, through grades 6-8, and are developing deep case studies of focal learners to understand how interest-driven, technology-enhanced, informal learning experiences (e.g. Connected Learning) relate to their development of deeper identification and aspirations toward STEM-related futures. We aim to develop a more holistic, longitudinal account of how STEM pathways develop with evidence for how aspects of identity, interests, and information literacy interact over time to strengthen or obstruct the development of these pathways. Our goal is to understand how to design ecosystems around youth – technology, learning environments, peers, and educators – to help young people pursue these pathways across their lives.

5) The WeatherBlur Platform: Co-creating an Online Learning Community

Ruth Kermish-Allen[1] , Karen Peterman[2], Heather Deese[1], Christine Bevc[3]
[1]Island Institute, [2]Karen Peterman Consulting, LLC, [3]University of North Carolina

The WeatherBlur platform was developed using a design-based research approach over the past 18 months through close collaboration between Island Institute staff, web developers, education researchers, and advisors representing each of our participant groups. A comprehensive needs-assessment and a series of in-person and virtual advisor meetings ensured that the WB platform would meet the diverse needs and backgrounds of the platform's user groups. We have used social networking analysis (SNA) to begin to explore the patterns of interaction among the user groups, including dynamic network models that target the mechanisms of tie formation, specifically the likelihood to participate in a discussion. In comparison to other site users, students led in the frequency of discussions, specifically commenting and "liking". Interactions were found to increase over time as activities shifted from observations to discussions. Students' knowledge of key science concepts and their data literacy skills also improved at a statistically significant level from the beginning to the end of the field test period. Importantly, results also indicate that the number of times a student logged into the platform predicted their post-content knowledge. This poster will share the iterative design process of building the WeatherBlur site in partnership with stakeholders, highlight the first full investigation, and present

findings of the social networking analysis and performance based assessments in data literacy. In addition, the poster will explore the concept of

6) Initial Version of FUN! Tool

Taylor Martin & Deborah Fields, Utah State University

We have developed an initial version of a Functional Understanding Navigator! (FUN!) tool that can be implemented into Scratch to show automated assessments to teachers and students regarding learnersâ€™ programming. FUN! is the tool which will implement the cumulative results of our learning analytics and is meant to be utilized by teachers and researchers to make learning visible in both structured and semi-structured settings. FUN! is developed recursively and will show the cumulative progress of novice programmers over the course of their learning in Scratch, thus the inclusion of a factorial (!) in the name.

TECHNOLOGY DEMONSTRATIONS

1) CTSiM - Computational Thinking through Simulation and Modeling

Gautam Biswas, Vanderbilt University

Development of CTSiM environment has been funded by the NSF Cyberlearning program. Students synergistically learn science and CT concepts combining an agent-based modeling paradigm and visual programming environment. Students conceptualize given science topics in terms of agent properties and behaviors and then build computational models for the same using a domain-specific programming language. Students execute their agent-based simulations to study individual and aggregated agent behaviors. The system has been successfully deployed in the classroom, and has produced large learning gains in both CT and science concepts. We can demonstrate CTSiM units in two domains: (1) Kinematics and (2) Ecology.

2) In Touch with Molecules: Learning Biology with Origami, Magnets and Augmented Reality

Jodi Davenport, WestEd

The In Touch with Molecules project, a collaboration between Dr. Arthur Olson, at the Scripps Research Institute and WestEd, investigates the potential of cyber-enabled tangible models to transform molecular biology instruction and enable students to learn STEM content that would not otherwise be addressed. The Scripps team develops tangible molecular models augmented with computer-generated imagery and data, and the WestEd team leads research and development on implementing these models in classroom settings. The models include innovative 3D-printed, origami, and augmented reality (AR) models of viral self-assembly, DNA, protein folding and enzymes. The demonstration will outline classroom uses of the models for three topics: (1) molecular self-assembly using a model of a virus, (2) DNA structure and function using an articulated model in which magnets simulate hydrogen bonds, and (3) enzyme structure and function using an augmented reality iPad app. Participants will have the opportunity to interact with the models.

3) Integrating Mobile Observation Tools within an Immersive, Room-Sized Simulation: New Supports for Science Inquiry

Jim Slotta & Michelle Lui, University of Toronto; Chris Quintana, University of Michigan

Digitally augmented physical spaces (e.g. smart classrooms) offer opportunities to engage students in novel and potentially transformative learning experiences within a setting that can support knowledge-building and learning communities. Mobile technologies offer opportunities for students to engage in inquiry activities that traverse formal classroom and informal out-of-class settings. This demo combines two such projects via an immersive rainforest simulation (EvoRoom) and a mobile inquiry platform (Zydeco) where co-located teachers and students can collect observational data from the environment and other settings, explore their peers' data using large visualizations displayed in the classroom simulation space, and engage in discussions about emerging patterns within their observational data, as well as other aspects of their inquiry. This system was employed as a research environment for a recent

study of students learning evolutionary biology, and could potentially be applied in a range of applications within school, museum, and other informal settings.

4) InquirySpace, CODAP and Learning with Graphs

Chad Dorsey, The Concord Consortium

Science should be learned in the way scientists learn, using inquiry-based learning or "extended inquiry." But achieving this involves engaging with and visualizing data from a variety of sources in versatile ways. InquirySpace, an NSF Cyberlearning INDP project, provides tools that greatly expand the range and sophistication of meaningful open-ended science investigations. InquirySpace uses three proven technologies—the versatile modeling environments of NetLogo and the Molecular Workbench, real-time data collection from probes and sensors, and the powerful visual data exploration capabilities of the Common Online Data Analysis Platform (CODAP) based on Fathom and Tinkerplots—and integrates them into a coherent, Web-based environment enabling rich, collaborative scientific inquiry. This demo will share student modeling examples, analytical tools and open source software environments under development for supporting inquiry, as well as demonstrating additional technology-based approaches for improving data and graph literacy currently under development at the Concord Consortium.

5) Turn Up the Heat!

Michael Horn, Northwestern University

As a society we face unprecedented challenges related to global environmental sustainability. One largely overlooked contributor to energy consumption and greenhouse gas emissions comes from domestic heating and cooling systems and the use of residential thermostats. Turn Up the Heat! is a collaborative board game that provides families with a playful context for discussing tradeoffs related to energy, comfort, and money. Through a tablet computer interface, the game offers all players (children and adults) the opportunity to set a thermostat on their turn. By allowing families to see the immediate effects of temperature settings with both a manual and programmable thermostat interface, we confront usability issues and misconceptions around residential thermostats. We'll also show how the game world and the real world can be combined by having the game interface control a real thermostat.

6) Build-a-Tree: A Phylogenetic Puzzle Game

Michael Horn, Northwestern University

In order to increase public understanding of evolution and life on earth, an interdisciplinary team of computer scientists, biologists, and learning scientists partnered to create Build-a-Tree (BAT), a multi-level puzzle game played on interactive tabletop surface. BAT is designed to help players understand phylogenetic trees, common descent, and shared derived traits of organisms. To level up, players drag-and-drop icons to assemble a tree that accurately represents connections between species and the traits they share. BAT is designed to encourage experimentation and free-form discussion as well as heighten player knowledge of basic biology and evolutionary. BAT has been on display at the California Academy of Sciences for over a year and has been used by thousands of visitors.

7) Thermogame: A Playful 3D Simulation for Engineering Education

John Pfotenhauer, David Gagnon, Mike Litzkow, Christine Pribbenow, Toussaint Minett and Jacob Hanshaw, University of Wisconsin - Madison

Thermodynamics is a gateway course into any engineering curriculum. In Thermogame, the material properties of water and mathematical relationships between pressure, temperature and volume are visualized beyond the traditional tables of numbers and rendered as a 3d landscape with an 80s arcade aesthetic. The context itself manifests the course principles, freeing the game design to provide player verbs and challenges that highlight the unique features of the space. Players add heat and work energy to the system in order to move a ball toward a goal or along a path, illustrating the underlying principles that describe real-world events and cycles such as steam turbines, pressure cooking and home heating systems. Through repeated experimentation and manipulation of the heat and work variables, students quickly aquire a better sense of some of the systems in play within thermodynamics. This project was produced with generous funding from the NSF TUES program and a small UW Madison ENGAGE award.

8) BioSim: A Participatory Simulation

Kylie Peppler, Indiana University

BioSim is a participatory simulation where K-3 students enact the roles of honeybees and biological systems through the assistance of electronically enhanced e-puppets, which are designed to enhance youths' understanding of complex systems through play. The e-puppets allow students to take on the role of a biological agent, such as a bee attempting to collect nectar. Within a game-like context, students then pursue a goal while responding to feedback from the puppet such as lights that indicate how much energy remains. By "being the bee", students gain a unique perspective on the challenges that bees face.

9) Craft Technologies 101

Deborah Fields, Utah State University

Craft Technologies is a new university course for undergraduate and graduate students who are new to (and often afraid of) computing and electronics. It bases new technology learning in hand crafts—sewing, quilting, knitting, wood working, scrapbooking, etc.—as a provocative entry point into computing, circuitry, material science, and the Maker movement. In this demo Deborah Fields presents students' culminating projects along with their reflections on what and how they learned, the importance of hand crafts in triggering students' sense of heritage and identities, and the role of the class in encouraging "bravery" in learning new skills. See and interact with physical projects that include a sensor sampler, turn signal bike suspenders, motion-sensor light-up trapeze pants, color changing necklaces, resistance sensor advent calendar, quilted game controllers, and light-up stabby voodoo dolls.

10) CyGaMEs Metaphorics – Instructional Games that Work. . . the Way the Mind Does

Debbie Denise Reese, Wheeling Jesuit University

Stop by! Innovator Debbie Denise Reese, Ph.D., will demonstrate the CyGaMEs Metaphorics process and product using its proof-of-concept instructional game, Selene: A Lunar Construction GaME (http://selene.cet.edu); data from 4,000 players; and algorithms transforming player log data into visualizations of achievement customizable and meaningful to kids, researchers, and educators. CyGaMEs Metaphorics produces instructional games that cause and measure learning through five components: input theory about knowledge; specify to-be-learned knowledge; embody knowledge in game; measure knowledge; and integrate knowledge within instruction. This process for instructional game design and embedded assessment aligns with tenants of Evidence-centered Game Design (ECgD, see http://onlinelibrary.wiley.com/doi/10.1111/bjet.12128/pdf). Assessments built into the games empirically determine the moment of learning, rate of learning, and any changes in that rate. The CyGaMEs method is applied analogical reasoning theory. Method and game have won numerous national awards from organizations such as Disney Research, the prestigious Science Magazine, the National Science Foundation, and the Association for Educational Communications and Technology. It is recognized as an example of what works in science education. The work has also been published in journals, books, and an encyclopedia.

11) Games, Learning and Society Unleash the EcoNauts

Robert Bohanan, University of Wisconsin at Madison; Paul Olson, Wisconsin Institute for Discovery

EcoNauts is a new single or multiplayer game that challenges middle school students to see the ramifications of the logging, farming and mining industries on ecologically sensitive lands in Wisconsin. The players have many choices about their career and the production and location of their assets. Students can ramp up their industries and make more money but at what cost? Will the attitudes of the players change when they see the land change in real time? The game is sure to bring on a multitude of issues to be discussed and instructional ideas to be developed. Playtest the game yourself and see how your choices will impact the land.

PANELS

Partnering for Impact Panel

Chair: **Jeremy Roschelle**, is director of the Center for Technology in Learning at SRI International as well as the PI of the Center for Innovative Research in Cyberlearning Learning (CIRCL), the resource center for the NSF Cyberlearning program. Dr. Roschelle specializes in the design and development of integrated interventions to enhance learning of complex and conceptually difficult mathematics and science; learning sciences-based research in mathematics education, on collaborative learning, and with interactive technology; and the management of large-scale multi-year, multi-institutional research and evaluation projects.

Panelists:
Natalie Harr, Teacher, NSF Einstein Fellow, has been a kindergarten/first grade teacher for nine years at Crestwood Primary School in Mantua, Ohio. Natalie has a B.S.E., summa cum laude, in early childhood education from Kent State University and an M.Ed. in teaching biological science from Miami University, Ohio. She was honored (3/4/2014) by President Obama as a recipient of "The Presidential Awards for Excellence in Mathematics and Science Teaching." Her passion is to promote Science, Technology, Engineering, and Mathematics (STEM) education in the primary grades, targeting our nation's youngest and most impressionable learners. Her most notable work is The "Crestwood-Antarctica Connection," that chronicles her experiences as the teacher liaison working on a NSF-funded scientific research team at Palmer Station, Antarctica. She is currently serving as an Albert Einstein Distinguished Educator Fellow at the National Science Foundation. She is working in the Computer & Information Science & Engineering directorate under the guidance of Janet Kolodner.

Janice Gobert (Ph.D. U. of Toronto, 1994) is an Associate Professor of Learning Sciences and Psychology and the Co-director of the Learning Sciences and Technologies Program at Worcester Polytechnic Institute. Her specialty is in simulation-based learning and assessment in science via log files and data mining, and intelligent tutoring systems for science. She is also the co-founder of Apprendis, a start-up company for student learning, assessment, and educational data mining.

Joyce Malyn-Smith, is the Principal Investigator for the National Science Foundation (NSF)–funded ITEST(Innovative Technology Experiences for Students and Teachers) Learning Resource Center, where she leads a team providing technical assistance and support to more than 170 NSF-funded projects and programs around the country. At EDC, Inc., she leads a body of work focusing on how individuals develop knowledge and technology skills in formal and informal settings then translate those into productive and rewarding careers. She served NSF as PI for 7 projects, ED as lead for the IT Career Cluster, and Boston Public Schools as a teacher & administrator.

Rajiv Ramnath is Associate Professor of Practice, in Computer Science and Engineering, Director of the Collaborative for Enterprise Transformation and Innovation (SETI), and an evangelist for AweSim (www.awesim.org). Dr. Ramnath received is Doctorate and Master's degrees in Computer Science from OSU and his Bachelor's degree in Electrical Engineering from IIT Delhi.

Reflectors Panel

Chair: **Barry Fishman** is a Professor in the Schools of Information and Education at the University of Michigan. His work focuses on the design of scalable and sustainable educational interventions, including the development of Design-Based Implementation Research (DBIR). He was co-author of the Obama Administration's 2010 U.S. National Educational Technology Plan, and served as Associate Editor of The Journal of the Learning Sciences from 2005-2012. Recent work includes the design of "gameful" environments to enhance motivation, including the GradeCraft LMS.

Panelists:
Barbara Means, Ph.D., is director of the Center for Technology in Learning at SRI International. She is an educational psychologist whose research focuses on ways in which technology can support students' learning of advanced skills and the revitalization of classrooms and schools. Recently named as a fellow of the American Educational Research Association, Means is regarded as a leader in defining issues and approaches for evaluating the implementation and efficacy of technology-supported educational innovations. She is the co-author of the new book "Learning Online: What Research Tells Us About Whether, When and How"

Darrell Porcello, Ph.D., is the Chief Technology Officer of the Lawrence Hall of Science at UC Berkeley, and leads the Center for Technology Innovation, a group of technical project managers, developers, graphic designers, science educators, and learning scientists, all committed to producing high quality, effective, and research-driven educational technology products. For over 10 years, he has designed and developed learning technologies supported by NSF, NIH, and NASA including Howtosmile.org, NASAWavelength.org, InformalScience.org, 24/7 Science, and DIY Sun Science.

Elliot Soloway, Ph.D., is the Arthur F. Thurnau Professor in the Department of Computer Science & Engineering at the University of Michigan. For over 15 years, Elliot's research has been guided by the vision that mobile, handheld – and very low-cost – networked devices are the only way to truly achieve universal 1:1 in schools – all across the globe.

Stephanie Teasley, Ph.D., is a Research Professor in the School of Information, University of Michigan. She is also the Director of the USE Lab- a community of scholars who investigate how instructional technologies and digital media are used to innovate teaching, learning, and collaboration. Her current work focuses on Learning Analytics

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PLACES TO EAT NEARBY

Restaurant Reservations for June 8 (chosen for location, variable pricing, availability of reservations for Sunday evenings, tastiness):

Restaurant	Address	Distance from Union	Cuisine	Website	Restaurant Phone Number
DLUX	117 MLK Blvd	1.24 mi	Fancy burgers	http://www.dluxmadison.com/	608 467-3130
Brickhouse BBQ*	408 W Gorham St	0.6 mi	Southern BBQ	http://www.thebrickhousebbq.com/	608 257 7675
Great Dane	123 E Doty St	1.33 mi	WI comfort food	http://downtown.greatdanepub.com/	608.284.0000
Tornado Steak House	116 S Hamilton St	1.14 mi	Steak/sea-food	http://www.tornadosteakhouse.com/	608 256-3570
Porta Bella	425 N Frances St	0.56 mi	Italian	http://www.portabellarestaurant.biz/	608 256-3186
Red Sushi	106 King St	1.28 mi	Japanese	http://redsushi.net/	608-256-3186

*Brickhouse BBQ requires manager approval for large party reservations

Other suggestions:

- Wasabi, 449 State St, http://www.wasabi-madison.com/
- Paisan's, 131 W Wilson St, http://www.paisansrestaurant.biz/
- Bassett Street Brunch Club, 444 West Johnson St, http://www.brunchclubmadison.com/home.aspx
- The Tipsy Cow, 111 S Hamilton St, http://www.tipsycowmadison.com/
- Dotty Dumpling's Dowry, 317 N Frances St, http://www.dottydumplingsdowry.com/
- The Old Fashioned, 23 N Pinckney St, http://www.theoldfashioned.com/
- Graze**, 1 S Pinckney St, http://www.grazemadison.com/
- Harvest**, 21 N Pinckney St, http://www.harvest-restaurant.com/
- Nostrano**, 111 S Hamilton St, http://nostranomadison.com
- Steenbock's on Orchard**, 330 N Orchard St, http://www.steenbocksonorchard.com/Home.aspx
- Dayton Street Grille**, 1 W Dayton St, http://daytonstreetgrille.com/

***Note: Most of these kitchens do not have dedicated gluten-free, vegetarian, or vegan kitchen equipment, so few completely clear guarantees can be made, although they will likely do the most possible to keep specified allergens, etc. away from requested orders. Also, Graze, Harvest, Nostrano, Steenbock's on Orchard, and Dayton Street Grille are closed on Sunday evenings.*

THINGS TO DO

- Visit The Chazen Museum of Art (chazen.wisc.edu), 750 University Ave, closed on Mondays
- Visit Madison Museum of Contemporary Art (mmoca.org), 227 State St, closed on Mondays
- Visit the Overture Center (overturecenter.com), 201 State St
- Take in the view on the Memorial Union Terrace, 800 Langdon St
- Ride a B-cycle (madison.bcycle.com) to explore the downtown area, multiple locations
- Watch screenings at UW Cinematheque (cinema.wisc.edu/), 821 University Ave
- Visit the Public library (http://www.madisonpubliclibrary.org/central), 201 W Mifflin St

THE UNIVERSITY of WISCONSIN MADISON

MEMORIAL UNION

4th Floor

Hotel Rooms
GreatHall
Class of '24 Recept. Room
Stairs
Elevator
Stairs
Stairs
Elevator
Capitol View
Stairs
Stairs to studios
Langdon Room

3rd Floor East

NOTE: Accessible from East elevator/ East end of building only.

Stairs
Beefeaters Room
Round Table Room
Board Room
Stairs
Elevator
W/M
Old Madison Room

3rd Floor West

NOTE: Studios are not handicapped accessible. Accessible from West stairs only.

Rosewood Room
Studio B
Studio A
Stairs to 2nd floor

2nd Floor

Tripp Deck
Tripp Commons
Stairs
Inn WI Deck
Profile Room
Art Gallery
Elevator
Stairs
Phone
Inn Wisconsin Room
Elevator
Stairs
Central Reservations and Conference Services
Main Entrance
Browsing Library
Main Lounge
Stairs
Phone
To Union Theater
Play Circle Theater
Stairs
Stairs
Annex Room Conference Headquarters

1st Floor

Entrance
Phone
Wisconsin Union Theater
Outside Terrace Area
To Terrace
Lakefront on Langdon
Rathskeller
Stairs
Elevator
Information Desk
Phones
Tyme
Front Entrance
Daily Scoop Deli
Stairs
To MU Games Room (downstairs)
Elevator
Box Office
To Park Street
Stairs
Paul Bunyan Room
Park Street Entrance