

10th International Conference of the Learning Sciences  
**The Future of Learning**



# Program

July 2-6, 2012  
Sydney, Australia

[www.isls.org/icls2012](http://www.isls.org/icls2012)

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HOSTED BY:



THE UNIVERSITY OF  
**SYDNEY**

Centre for Research on Computer  
Supported Learning & Cognition (CoCo)

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## CONTENTS

Welcome.....	3
Organisers and committee .....	4
Keynote speakers.....	6
The Social Side .....	7
Stay connected – Assistance and wifi at the conference.....	7
Program - Mon July 2.....	8
Program – Tues July 3 .....	9
Opening & Keynote 1 :: Janet Kolodner :: 16.30 – 18.30 .....	10
ICLS Opening Gala Night :: 18.45 – 21.30.....	10
Program –Weds July 4.....	11
Keynote 2 :: Manu Kapur :: 8.30-10.00 .....	11
Parallel Session 1 :: 10.15 – 11.45 .....	11
Parallel Session 2 :: 12.45 – 14.15 .....	13
Parallel Session 3 :: 14.30 - 16.00.....	14
Parallel Session 4 :: 16.30 - 18.00.....	16
Program – Thurs July 5.....	18
Keynote 3 :: Judy Kay –sponsored by NSW Trade & Investment.....	18
Parallel Session 5 :: 10.15 – 11.45 .....	18
Parallel Session 6 :: 12.45 – 14.15 .....	20
Parallel Session 7 :: 14.30 - 16.00.....	22
Presidential Session :: SS8.2 :: 16.20 – 17.50 .....	23
Social night cruise :: 19.00 – 22.30.....	24
Program – Fri July 6.....	26
Keynote 4 :: Pierre Dillenbourg :: 8.30-10.00.....	26
Parallel Session 9 :: 10.15 – 11.45 .....	26
Closing Ceremony and Awards :: 11.45 – 12.30.....	27

Location and logistics..... 28

The conference takes place on the University of Sydney's [Camperdown and Darlington campus](#), 2kms from Sydney city centre.

Maps of the University of Sydney can be found at <http://sydney.edu.au/maps/index.shtml>



Worried about finding your way around the University? Download Lost on Campus, an app for Android or Apple that makes finding your way too easy, as the Aussies like to say. [lostoncampus.com.au/](http://lostoncampus.com.au/)



## ICLS 2012

### WELCOME

On behalf of the Organizing Committee, we are delighted to welcome you to Sydney for the *International Conference of the Learning Sciences* – ICLS 2012. Since the first ICLS in 1991, the conference has developed a reputation as one of the leading scientific meetings for reporting the most current and rigorous research into how people learn and how to design environments for learning in formal and informal settings.

On this, its tenth anniversary and the first time it has been hosted in the Asia-Pacific region, ICLS looks forward with its theme: "*The Future of Learning*." ICLS 2012 will bring together researchers, academics, professionals, and educators from all over the world to share their experiences, discuss trends, and examine how the learning sciences can and should impact the future of learning.

Conference highlights include keynote presentations by distinguished researchers in the field: Janet Kolodner, Pierre Dillenbourg, Judy Kay, and Manu Kapur. In addition, there is a Presidential Session on the future of learning and an overall ICLS schedule that includes 18 symposia, 126 papers, and 63 posters over 8 parallel sessions. There are also 11 pre-conference workshops, including the Doctoral Consortium and Early Career Workshop. The conference provides ample opportunity to socialize with a Gala Opening Night and an optional (but highly recommended) dinner cruise on Sydney Harbour on Thursday evening.

The conference venue combines the new with the old; sessions will take place in the state-of-the-art New Law Building and the Eastern Avenue Complex on the grounds of the University of Sydney (Australia's oldest university) close to Sydney's Central Business District. Nearby are some of Sydney's best places to eat whatever your budget: from opulence and history in the Rocks, to excellent everyday fare in nearby Glebe and Newtown. We hope that you enjoy not only the conference but also your visit to our city and our university.

ICLS could not proceed without the hard work of many individuals. We are deeply appreciative of the countless hours and expertise put in by our Conference Advisory Board and the various conference sub-committees. We would like to thank all those who assisted with the review process. The Conference is also fortunate to have a number of financial sponsors whose support contributes to conference events: *NSW Trade & Investment*, *Smart Services Collaborative Research Centre*, *United States National Science Foundation*, the *International Society of the Learning Sciences*, *Asia-Pacific Society of Computers in Education*, and the *Centre for Research on Computer Supported Learning and Cognition (CoCo)* at the Faculty of Education and Social Work.

In addition, we would like to thank our volunteer staff who will be working hard over the course of the conference to insure everyone has the best possible experience, our session chairs, and all those who volunteered their assistance with the event. And, of course, we would like to thank you, our attendees. We look forward to rigorous research findings and spirited discussions as together we engage issues and opportunities for enhancing learning that will help people meet the dynamic challenges of the 21<sup>st</sup> century.

Welcome to Sydney and to ICLS 2012.



Professor Michael Jacobson

*ICLS 2012 Conference Chairs*



Professor Peter Reimann



## ORGANISERS AND COMMITTEE

### CONFERENCE CHAIRS

- Michael J. Jacobson | The University of Sydney
- Peter Reimann | The University of Sydney

### CONFERENCE ADVISORY BOARD

- Shaaron Ainsworth | University of Nottingham, UK
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- Uri Wilensky | Northwestern University, United States
- James Pellegrino | University of Illinois, Chicago, United States

### PAPER REVIEW COORDINATION

- Peter Reimann | University of Sydney
- Peter Freebody | University of Sydney
- Eleni Kyza | Cyprus University of Technology, Cyprus
- Ton de Jong | University of Twente, the Netherlands
- Nick Kelly | University of Sydney

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- Jan van Aalst | Hong Kong University, Hong Kong
- Brian J. Reiser | Northwestern University, United States
- Cindy Hmelo-Silver | Rutgers University, United States
- Kate Thompson | University of Sydney

### DOCTORAL CONSORTIUM

- Susan Yoon | University of Pennsylvania, United States
- Wouter Van Joolingen | University of Twente, the Netherlands
- Nino Aditomo | University of Sydney, Australia

### EARLY CAREER WORKSHOP

- Tom Moher | University of Illinois, Chicago, United States
- Tak-Wai Chan | National Central Taiwan University, Taiwan

### PRE-CONFERENCE WORKSHOPS AND SPECIAL SESSIONS

- Lina Markauskaite | University of Sydney
- Dan Suthers | University of Hawaii, United States
- Carol Chan | Hong Kong University, Hong Kong
- Nikol Rummel | Ruhr-Universität Bochum, Germany

### LOGISTICS AND ADMINISTRATIVE SUPPORT

- Sadhbh Warren | University of Sydney
- Dorian Peters | University of Sydney
- Sadhana Puntambekar | ISLS
- Dana Gnesdilow | ISLS

### VOLUNTEERS

Cathriona Tobin, Polly Lai, David Ashe, Nino Aditomo, Shaista Bibi, Maryam Khosronejad, Patricia Thibaut Paez, Karen Hielscher, Andrew Clayphan, Roberto Martinez, Sonya Corcoran, Aikaterini Kokkinaki, Mai Xuan Le, Meng Yew Tee, Bruce Poon, Wai-Leng Wong

### SESSION CHAIRS

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## ABOUT ISLS

ISLS is a professional society dedicated to the interdisciplinary empirical investigation of learning as it exists in real-world settings and how learning may be facilitated both with and without technology. ISLS sponsors two professional conferences, held in alternate years. The International Conference of the Learning Sciences (ICLS), first held in 1991 and held bi-annually since 1996, covers the entire field of the learning sciences. <http://www.isls.org/>

## ABOUT "COCO" AT THE UNIVERSITY OF SYDNEY

ICLS 2012 is hosted by the Centre for Research on Computer Supported Learning and Cognition (CoCo) in the Faculty of Education and Social Work at the University of Sydney. CoCo's mission is to contribute to theory and research in the field of the learning sciences in order to explore how innovative learning technologies and pedagogical approaches can enhance learning. <http://sydney.edu.au/edsw/coco>

## OUR SPONSORS

ICLS2012 would like to thank our sponsors:

- NSW Trade & Investment
- Centre for Research on Computer Supported Learning and Cognition (CoCo) at the Faculty of Education and Social Work
- Smart Services Collaborative Research Centre
- Springer Science+Business Media



The Early Career workshop and Doctoral Consortium would particularly like to thank the following organisations for their support:

- National Science Foundation
- The International Society of the Learning Sciences
- Asia-Pacific Society of Computers in Education



We would also like to thank the following for their generosity and assistance with the conference.

- Inquirium
- Routledge, Taylor & Francis Group
- ascilite 2012

## KEYNOTE SPEAKERS

### JANET KOLODNER

Professor Janet Kolodner is a Regents' Professor in the School of Interactive Computing at the Georgia Institute of Technology. She was founding Editor-in-Chief of The Journal of the Learning Sciences and a founder of the International Society for the Learning Sciences, and she served as the society's first Executive Officer. Her research has addressed issues in learning, memory, and problem solving in computers and in people. She pioneered case-based reasoning (CBR), and her lab originated the notion of a case-based design aid (CBDA). She has been a leader in articulating the cognitive model that case-based reasoning implies and the applications and implications of case-based reasoning for education and creative problem solving.



Since 1994, Kolodner has focused on using this model to design science curriculum for middle school. Her approach, called Learning by Design™ (LBD), is a key foundational component of the comprehensive 3-year middle-school science curriculum called Project-Based Inquiry Science (PBIS). With her students, she has also applied the approach to informal education, most notably to design of Kitchen Science Investigators, an after-school program focused on learning science from cooking experiences. At present, she is on loan to the U.S. National Science Foundation, where she is lead Program Officer for a new funding program called Cyberlearning: Transforming Education.

Janet will deliver the opening keynote, "Envisioning the Next Generation Classroom and the Next Generation of Learning Technologies" on Tuesday afternoon. For more information see the full program listing for Tuesday.

### MANU KAPUR

Manu Kapur is an Associate Professor of Curriculum, Teaching and Learning (CTL) and a researcher in the Learning Sciences Lab (LSL) at the National Institute of Education (NIE) of Singapore. An engineer by bachelors training, Manu taught mathematics to 12th graders in Singapore before getting his doctorate in instructional technology and media from Teachers College Columbia University, where he also completed a Master of Science in Applied Statistics. Manu conceptualized the notion of productive failure to explore the hidden efficacies in the seemingly failed effort of small groups solving complex problems collaboratively in an online environment. Over the past six years, Manu has done extensive work on productive failure in mathematics classrooms in Singapore, during which time, his research has also attracted interest and funding both locally and internationally.



Manu will deliver his keynote on Productive Failure on Wednesday morning. For more information see the full program listing.

### JUDY KAY

Judy Kay is Professor of Computer Science at the University of Sydney and a principal in [CHAI \(Computer Human Adapted Interaction\)](#), leading research into advanced technologies for human computer interaction, personalization, pervasive and mobile interaction. She is Immediate Past President of the International Artificial Intelligence in Education Society (IAIED).



Her personalization research aims to empower people to harness and control the large amounts of data from their digital footprints, to support life-long and life-wide learning. The research ranges from direct mirrors with useful forms of that data in Open Learner Models, data mining to extract meaningful additional insights and personalized interfaces. Critical to this vision is that the user should always have a sense of control over the personalization. She works on innovative user interfaces, with software for surface computing such as interactive tabletop and wall displays. This explores the new ways that this emerging technology can help small groups to learn collaboratively and to learn how to collaborate more effectively.

Judy Kay's keynote, presenting a vision for lifelong learning as a driver for designing pervasive technologies, will take place on Thursday morning and is sponsored by NSW Trade & Investment. For more information see the full program listing.

## PIERRE DILLENBOURG

Pierre Dillenbourg is professor of computer science at Swiss Federal Institute of Technology in Lausanne (EPFL). A former teacher in elementary school, Pierre graduated in educational science (University of Mons, Belgium). He started to conduct research in learning technologies in 1984. He obtained a PhD in computer science from the University of Lancaster (UK), in the field of educational applications of artificial intelligence.



He is past president of the International Society for the Learning Sciences. His work covers various domain of computer-supported collaborative learning (CSCL), ranging from novel interfaces for face-to-face collaboration (tabletops, tangibles, paper computing) to more cognitive projects on dual eye tracking. His current work focuses on classroom orchestration, i.e. the process by which teachers manage multi-level activities (solo, group, plenary) while handling the many constraints of the daily school life. He aims to build technologies that minimize the orchestration load. His lab also conduct projects in educational robotics.

At ICLS 2012, Pierre will give our final keynote of the conference, titled "Classroom orchestration: interweaving digital and physical workflows". For more information see the full program listing for Friday.

## THE SOCIAL SIDE

### TUESDAY NIGHT :: GALA OPENING NIGHT

All registered delegates are invited to join us for our Gala Opening night, taking place on Tuesday in the University's historic Holme Building from 6.30pm until 9.30pm. In addition to the opening of the conference we will be celebrating a very special occasion – ICLS's 10<sup>th</sup> birthday! Music, mingling, canapes and plenty of drinks of all kinds are on the menu in what promises to be a very lively opening night. Attendance at the Gala Night is included in conference registration.

### THURSDAY NIGHT :: SOCIAL NIGHT DINNER AND CRUISE (OPTIONAL)

Your attendance is optional (but highly encouraged) at the ICLS social highlight of a Thursday Night Social Dinner and Cruise. We have chartered a Sydney showboat for the exclusive use of our delegates. Join us for all-inclusive three-hour cruise on Sydney Harbour and enjoy amazing views of the Sydney skyline (including the iconic Opera House and Harbour Bridge) while you enjoy dinner, drinks and an evening's entertainment. The cruise leaves from Darling Harbour at 7.15pm sharp and attendees will need to make their way there by 7pm. The cruise will end at approximately 10.30pm. For more information see the full program listing for Thursday.



This promises to be a very memorable evening and we look forward to dancing the night away with you all! Registration and payment for the cruise takes place through the main conference registration system at a cost of \$90 per person. Places are limited and some tickets may also be available at the conference information desk, at an increased cost.

## STAY CONNECTED – ASSISTANCE AND WIFI AT THE CONFERENCE

Need a little help with something? Just ask our registration and volunteer staff, or visit the information desk in the New Law Building (room 113, the Law Lounge). The desk is manned from 8am – 4pm on Weds and Thurs, and 8am to 11am on Friday.

Delegates have access to free wifi on campus via the University. To access, find the Usyd-Guest network with your device.

- Put in the Sydney2011 password when prompted
- And then input guest account User Name : ICLS and guest account Password : wxFD7maW

**YOUR DELEGATE BADGE IS REQUIRED FOR ADMISSION TO ALL EVENTS, INCLUDING SOCIAL EVENTS AND WORKSHOPS. PLEASE WEAR YOUR BADGE AT ALL TIMES.**

## PROGRAM - MON JULY 2

### PRECONFERENCE WORKSHOPS

Pre-conference workshops are optional and incur an additional fee. Registration is required, and the number of participants limited. Morning and/or afternoon tea will be provided for participants, and served at approximately 10.30am and 3.00pm.

### FULL DAY WORKSHOPS :: MONDAY 9.00AM – 5.30PM

ID	Workshop Title Lead/Organisers	Location
W2	<b>Analyzing collaborative learning at multiple levels</b> Gerry Stahl, Drexel University, USA; Keith Sawyer, Washington University in St. Louis, USA; Heisawn Jeong, Hallym University, South Korea; Dan Suthers, University of Hawaii, USA	Room 408, Education Building
W3	<b>What Is “Engagement” in Math and Science Learning?</b> Nicole Shechtman, SRI International; K. Ann Renninger, Swarthmore College; Judith Harackiewicz, University of Wisconsin, Madison; Britte Cheng, SRI International; Geneva Haertel, SRI International	Room 409, Education Building
W11	<b>Digital Ecosystems for Collaborative Learning (DECL 2012) - Embedding Personal and Collaborative Devices to Support Classrooms of the Future.</b> Roberto Martinez, The University of Sydney, Australia; Pierre Dillenbourg, École Polytechnique Fédérale de Lausanne, Switzerland; James Slotta, University of Toronto, Canada; Mike Tissenbaum, University of Toronto, Canada; Beat Schwendimann, The University of Sydney, Australia; Andrew Clayphan, The University of Sydney, Australia; Christopher Ackad, The University of Sydney, Australia	Boardroom 124, Building J12 , School of Information Technologies
DC	<b>Doctoral Consortium – kindly supported by the NSF, ISLS, and APSCE</b> Susan Yoon, University of Pennsylvania; Wouter Van Joolingen, University of Twente; Nino Aditomo, University of Sydney Participants - Chandan Dasgupta; Jill Fielding-Wells; Alessandro Gnoli; Yotam Hod; Jennifer King Chen; Mon-Lin (Monica) Ko; Margaret Lucero; Michelle Lui; Crystle Martin; Murat Oztok; Erin Pfaff; Suzanne Rhodes; Nils Rohde; Elsa Sato; Johan van Strien; Joyce Wang (student assistant); Jason Yip	Room 459, Education Building
EA	<b>Early Career Workshop – kindly supported by the NSF, ISLS, and APSCE</b> Tom Moher, University of Illinois, Chicago; Tak-Wai Chan, National Central Taiwan University Participants - Cesar Delgado, Candace Walkington, Jennifer Chiu, Robb Lindgren, Camillia Matuk, Adam Carberry Michelle Jordan, Kevin McElhaney, Sean Duncan, Alecia Marie Magnifico, Beat Schwendimann, Astrid Wichmann, Jen Scott Curwood, Emma Mercier, Miwa Takeuchi	Room 436, Education Building

### HALF DAY WORKSHOPS :: MONDAY 9.00AM – 5.30PM

ID	Workshop Title Lead/Organisers	Time	Location
W8	<b>Tightening research-practice connections: applying insights and strategies during design charrettes</b> Susan McKenney, University of Twente, Netherlands; Kim Gomez, University of California, Los Angeles; Brian Reiser, Northwestern University	Monday morning 9.00am – 12.30pm	Room 418, Education Building

Also occurring :

ID		
	<b>Re-thinking Student and Teacher Roles in Future Learning (<i>pre-conference practitioner session</i>) – not part of the ICLS program, see <a href="http://sydney.edu.au/news/iisme/1875.html?eventid=9529">http://sydney.edu.au/news/iisme/1875.html?eventid=9529</a> for details</b> Eric Hamilton Pepperdine University; Moseli Mafa, Lesotho College of Education; Wendy Chaves Los Angeles Unified School District; Kelly Castaneda, Crossroads School, Santa Monica CA; Gina Chaves Los Angeles Unified School District; Israel Ramirez Los Angeles Unified School District; Palesa Khotso, Lesotho College of Education; Mamotena Jankie, Lesotho College of Education; Makomosela Qhobela, National University of Lesotho  <i>This is a two part workshop, with this first session NOT a part of the ICLS program. See Tuesday Workshop W10 for part 2, the conference session.</i>	Monday afternoon 2.00pm – 5.30pm  Room 419, Education Building



**PROGRAM – TUES JULY 3**
**PRECONFERENCE WORKSHOPS**

Pre-conference workshops are optional, and incur an additional fee. Morning tea will be provided for participants, and served at approximately 10.30am.

**HALF DAY WORKSHOPS :: TUESDAY 9.00AM – 1.00PM**

ID	Workshop Title Lead/Organisers	Location
W5	<b>Classroom Orchestration: Moving Beyond Current Understanding of the Field</b> Yannis Dimitriadis, University of Valladolid, Spain; Pierre Dillenbourg, EPFL, Lausanne, Switzerland; Miguel Nussbaum, Pontificia Universidad Católica de Chile, Chile; Chee-Kit Looi, Nanyang Technological University, Singapore; Jeremy Roschelle, Stanford Research Institute International, USA	Room 408, Education Building
W6	<b>Teachers as Designers of Technology-Enhanced Learning Materials</b> Yael Kali, University of Sydney; Susan McKenney, University of Twente, Netherlands	Room 409, Education Building
W7	<b>Bifocal Modeling: combining virtual and physical experiments using low-cost sensors and open-source computer modeling</b> Paulo Blikstein, Stanford University, School of Education; Tamar Fuhmann - Stanford University, School of Education; Daniel Greene - Stanford University, School of Education; Shima Salehi - Stanford University, School of Education; Claire Rosenbaum - Stanford University, School of Education; Marcelo Worsley - Stanford University, School of Education	Room 418, Education Building
W9	<b>Developing a Competitive Educational Research Proposal for NSF's Division of Research on Learning</b> Sandra Toro Martell, National Science Foundation; Janet Kolodner, National Science Foundation	Room 424, Education Building
W10	<b>Re-thinking Student and Teacher Roles in Future Learning: Creativity, Intergenerational Collaboration, and Digital Media (conference session)</b> Eric Hamilton Pepperdine University; Moseli Mafa, Lesotho College of Education; Wendy Chaves Los Angeles Unified School District; Kelly Castaneda, Crossroads School, Santa Monica CA; Gina Chaves Los Angeles Unified School District; Israel Ramirez Los Angeles Unified School District; Palesa Khotso, Lesotho College of Education; Mamotena Jankie, Lesotho College of Education; Makomosela Qhobela, National University of Lesotho  <i>This is a two part workshop, with the second session being part of the ICLS program. See Mon afternoon also occurring for part 1.</i>	Room 419, Education Building
DC	<b>Doctoral Consortium – kindly supported by the the NSF, ISLS, and APSCE</b> Susan Yoon, University of Pennsylvania; Wouter Van Joolingen, University of Twente; Nino Aditomo, University of Sydney Participants - Chandan Dasgupta; Jill Fielding-Wells; Alessandro Gnoli; Yotam Hod; Jennifer King Chen; Mon-Lin (Monica) Ko; Margaret Lucero; Michelle Lui; Crystle Martin; Murat Oztok; Erin Pfaff; Suzanne Rhodes; Nils Rohde; Elsa Sato; Johan van Strien; Joyce Wang (student assistant); Jason Yip	Room 459, Education Building
EA	<b>Early Career Workshop kindly supported by the NSF, ISLS, and APSCE</b> Tom Moher, University of Illinois, Chicago; Tak-Wai Chan, National Central Taiwan University Participants - Cesar Delgado, Candace Walkington, Jennifer Chiu, Robb Lindgren, Camillia Matuk, Adam Carberry Michelle Jordan, Kevin MeElhaney, Sean Duncan, Alecia Marie Magnifico, Beat Schwendimann, Astrid Wichmann, Jen Scott Curwood, Emma Mercier, Miwa Takeuchi	Room 436, Education Building

Also occurring :

ID	Closed meetings	Location
M1	JLS Board meeting - 13.30 – 15.00	ED408, Education Building
M2	ijCSCL Board meeting - 15.00 – 16.30	EA116

## PROGRAM – TUES JULY 3

### REGISTRATION OPENS :: 15.00

Registration and conference pack pick-up takes place in the Eastern Avenue Auditorium Lobby on the Camperdown campus of the University of Sydney.

Registration and conference pack pick-up opens at 3.00pm in the lobby of the Eastern Avenue Auditorium (referred to as the EA Aud). As it is expected to be busy, we recommend you turn up early to beat the crowds. The nearby Law Lounge (room 113), and other rooms in the Eastern Avenue complex, will be available to delegates looking to relax or catch up on work before the conference starts and wifi internet access is also available.

*Arriving late? Registration/conference badge pick-up is in the New Law Lounge from Wednesday to Friday, at the conference information desk.*

### OPENING & KEYNOTE 1 :: JANET KOLODNER :: 16.30 – 18.30

The Conference opens at 16.30 in the Eastern Avenue Auditorium (EA AUD). This session runs from 16.30 to 18.30, and includes the first keynote talk of the conference, to be given by Janet Kolodner.

Janet's keynote is titled "Learning Scientists Changing the World: Opportunities and Challenges".

Back in 1990, when I founded The Journal of the Learning Sciences, I expressed the hope, in my opening editorial, that what we learned about learning as learning scientists would make a real difference in the world. That hasn't happened as fast as I was looking forward to. On the other hand, we know a lot more about learning and promoting learning some two decades later, and in the past few years, we've seen a proliferation of new technologies that may make it easier to transition what we have been learning about learning into real use.

In this talk, I will present some of the promise I see in what our community has been doing over the past two decades, some opportunities I see for increasing and transforming the opportunities people have for learning, and some of the challenges to making real-world contributions through our research. Some of those challenges have to do with systems in place in the world, and some have to do with how we organize ourselves as a community of researchers. The vision I will present is drawn from my personal experiences as Editor in Chief of JLS for 18 years, as a pedagogy designer and curriculum creator (who co-authored a wonderful science curriculum that is not selling as well as we'd like), as a developer of learning technologies (who could never manage to get any of them used), and most recently, as a program officer at the US National Science Foundation. Note, however, that I won't give away any NSF secrets, and my talk will not in any way represent plans for support of learning sciences and learning technologies at NSF.

### ICLS OPENING GALA NIGHT :: 18.45 – 21.30

All delegates are invited to our Gala Opening night, taking place on Tuesday in the University's historic Holme Building from 6.45pm until 9.30pm.

The Gala will be held in the Refectory, the grand hall of the building, under the soaring ceiling and backdrop of the renowned mural "Mankind" painted by Vergil Lo Schiavo ([pdf](#)). Canapés, and alcoholic and non-alcoholic refreshments, will be available in abundance on the night so join us as we open the conference and celebrate ICLS's 10<sup>th</sup> birthday.

Attendance at the Gala Night is included in conference registration for delegates, additional guests must purchase a ticket to attend.

**YOUR DELEGATE BADGE IS REQUIRED FOR ADMISSION TO ALL EVENTS, INCLUDING SOCIAL EVENTS AND WORKSHOPS. PLEASE WEAR YOUR BADGE AT ALL TIMES.**

**PROGRAM – WEDS JULY 4**

A full day of events from 8.00 to 18.00, including a keynote and 4 parallel sessions, starting with a light breakfast from 8.00.

**BREAKFAST :: 8.00 - 8.30 - CATERED**

**KEYNOTE 2 :: MANU KAPUR :: 8.30-10.00**

Manu's keynote, titled "**Productive Failure**" takes place in the Eastern Avenue Auditorium (EA AUD) from 8.30am – 10.00am.

Manu will describe his program of research on productive failure (PF), which is now into its ninth year. PF is a learning design that leverages students' formal as well as intuitive ideas about concepts they have yet to learn to design learning. PF provides opportunities for students to design solutions to complex, novel problems even though they may fail to produce canonical solutions in the process. This failure however can potentially be the locus of deep learning as it affords students the opportunity to collaboratively generate, elaborate, critique, and refine their representations and solution strategies—a process that is germane for learning. Manu will share empirical evidence from a series of experimental and quasi-experimental studies with 7th-11th graders in Singapore and Indian mathematics classrooms, and discuss implications for theory and practice.

**MORNING TEA - 10.00 -10.15 (CATERED)**

**PARALLEL SESSION 1 :: 10.15 – 11.45**

ID	PARALLEL SESSION 1	Location
Sym1.1	<b><u>Symposium 1.1</u></b> <b>Critical Aspects in Learning with Technologies</b> Ching Sing Chai, Huang Yao Hong, Hwee Ling Koh, Naomi Miyake, Chwee Beng Lee, Choon Lang Quek, Peter Reimann	EA Aud
Pst1.1	<b><u>Poster Session 1.1</u></b> <b>Computer Input Capabilities that Stimulate Diagramming and Improved Inferential Reasoning in Low-performing Students</b> Sharon Oviatt, Kumi Hodge, Andrea Miller <b>The comparison of the reinvestment of collaborative asynchronous discourse observed by two main actors of pre-service teacher education</b> Stephane Allaire <b>Effectiveness of combining worked examples and deliberate practice for high school geometry</b> Mariya Pachman, John Sweller, Slava Kalyuga <b>Can Technology-Based Gaze Replays of Experts Model Diagnostic Performance of Novices? A Test in Medical Education</b> Marko Seppanen, Andreas Gegenfurtner <b>Use of a CSCW platform by trainers and trainees Trace analysis: multimodal analysis vs data mining approach</b> Jean Simon, Henri Ralambondrainy <b>Learning and Empowerment: Designing a Financial Literacy Tool to Teach Long-term Investing to Illiterate Women in Rural India</b> Akshay Sharma, Aditya Johri <b>Improving students' scientific reasoning skills via virtual experiments and worked examples</b> Shiyu Liu and Keisha Varma <b>Facilitating Teachers' Integrated Technological Pedagogical Content Knowledge</b> Hsin-Yi Chang <b>The Power of Improvement Networks to Transform Educational Inquiry: A Preliminary Exploration</b> Jonathan Dolle, Peter Wardrip, Jennifer Russell, Louis Gomez, Anthony Bryk	NL100

ID	PARALLEL SESSION 1	Location
Sym1.2	<p><b><u>Symposium 1.2</u></b></p> <p><b>Engaging Middle School-Aged Students in Classroom Science and Mathematics: Implications for Design and Research</b> Kimberley Pressick-Kilborn, Melissa Gresalfi, K. Ann Renninger, Jessica Bachrach, Nicole Shechtman, Britte Cheng, Patrik Lundh, Gucci Trinidad, Richard Walker</p>	NL102
FP1.1	<p><b><u>Full Paper Session 1.1</u></b></p> <p><b>Learning how to create: Toward a learning sciences of art and design</b> Sawyer, Keith</p> <p><b>Is Computer Support More Significant than Collaboration in Promoting Self-Efficacy and Transfer?</b> Andreas Gegenfurtner, Marja Vauras, Koen Veermans</p> <p><b>Situating epistemological development</b> Sandoval, William</p>	NL105
FP1.2	<p><b><u>Full Paper Session 1.2</u></b></p> <p><b>Investigating the Relative Difficulty of Various Complex Systems Ideas in Biology</b> Sao-Ee Goh, Susan Yoon, Joyce Wang, Zhitong Yang, Eric Klopfer</p> <p><b>Multiple Trajectories for Understanding Ecosystems</b> Catherine Eberbach, Cindy Hmelo-Silver, Rebecca Jordan, Suparna Sinha, Ashok Goel</p> <p><b>Understanding How Learners Grapple with Wicked Problems in Environmental Science</b> Brian Slattery, Chandan Dasgupta, Tia Shelley, Leilah Lyons, Emily Minor, Moira Zellner</p>	NL107
FP1.3	<p><b><u>Full Paper Session 1.3</u></b></p> <p><b>Challenging Assumptions: using sliding window visualizations to reveal time-based irregularities in CSCL processes</b> Gregory Dyke, Rohit Kumar, Hua Ai, Carolyn Rose</p> <p><b>The Impacts of Flexible Grouping in a Mobile-Assisted Game-based Chinese Character Learning Approach</b> Lung-Hsiang Wong, Ching-Kun Hsu, Jizhen Sun, Ivica Boticki</p> <p><b>Processes of decision-making with adaptive combinations of wiki and chat tools</b> Kate Thompson, Nick Kelly</p>	NL115
SP1.1	<p><b><u>Short Paper Session 1.1</u></b></p> <p><b>Collaborative Reading Comprehension with Communication Robots as Learning Partner</b> Jun Oshima, Ritsuko Oshima, Naomi Miyake</p> <p><b>Inevitable breakdowns in putting argumentation into practice</b> Baruch B. Schwarz, Nitza Shahar</p> <p><b>Memetic Processes as Conceptual Framework for Idea Improvement in Knowledge Building</b> Karsten Krauskopf, Johanna Bertram, Ya Ping (Amy) Hsiao, Stefan Huber, Katherine Panciera, Nicole Strafling, Astrid Wichmann, Jan van Aalst</p> <p><b>Legitimate Peripheral Participation in Academic Communities of Practice - How Newcomers' Learning is Supported in Student Councils</b> Julia Eberle, Karsten Stegmann, Frank Fischer</p> <p><b>Using Critical Reading Tools to Facilitate the Learning of Argumentation Skills</b> Jingyan Lu, Nancy Law</p> <p><b>Developing Primary Students' Argumentation Skills in Inquiry-Based Mathematics Classrooms</b> Jill Fielding-Wells, Katie Makar</p>	NL 117

**LUNCH BREAK :: 11.45 - 12.45 (NOT CATERED)**

Lunches are not catered but there are plenty of options nearby. (See the CoCo's Rough Guide to Sydney for suggestions.)

ID		Location
M3	<b>Closed meeting - ISLS Board Meeting</b>	EA 116



**PARALLEL SESSION 2 :: 12.45 – 14.15**

ID	PARALLEL SESSION 2	Location
Sym2.3	<p><b><u>Symposium 2.3</u></b></p> <p><b>Building Upon What Is Already There: The Role of Prior Knowledge, Background Information, and Scaffolding in Inquiry Learning</b> Christof Wecker, Ard Lazonder, Jennifer Chiu, Cheryl Madeira, Jim Slotta, Yvonne Mulder, Ton de Jong, Alexander Rachel, Hartmut Wiesner, Peter Reimann</p>	EA Aud
Pst2.2	<p><b><u>Poster Session 2.2</u></b></p> <p><b>Advancing understanding using Nonaka's model of knowledge creation and problem-based learning</b> Meng Yew Tee, Shuh Shing Lee</p> <p><b>The Idea Manager: A tool to scaffold students in documenting, sorting, and distinguishing ideas during science inquiry</b> Camillia Matuk, Kevin McElhane, Jennifer King Chen, David Miller, Jonathan Lim-Breitbart, Marcia Linn</p> <p><b>Teacher education students' research training and e-research: current perspectives and potential for development</b> Carlos Gonzalez</p> <p><b>Promoting teacher candidates' awareness for teaching dilemmas: A field experiment</b> Elisabeth Wegner, Iris Kaufmann, Matthias Nuckles</p> <p><b>The Candy Factory Game: An Educational iPad Game for Middle School Algebra-Readiness</b> Michael Evans, Anderson Norton, Kirby Deater-Deckard, Mido Chang</p> <p><b>Evaluating Claims in Popular Science Media: Nature of Science Versus Dynamic Epistemological Knowledge</b> Pryce Davis, Rosemary S. Russ</p> <p><b>Adolescent profiles of knowledge and epistemic beliefs in the context of reading multiple texts</b> Leila Ferguson, Ivar Braten, Helge I. Strømsø, Øistein Anmarkrud</p> <p><b>Enhancing students' understanding of what ideas are for knowledge building</b> Chieh-Hsin Chiu, Huang-Yao Hong</p>	NL100
Sym2.4	<p><b><u>Symposium 2.4</u></b></p> <p><b>Learning as Identity Formation: Implications for Design, Research, and Practice</b> Rick Jochen, Ben DeVane, Tamara Clegg, Vanessa Peters, Nancy Songer, Susan R Goldman, Cindy Hmelo-Silver</p>	NL102
FP2.4	<p><b><u>Full Paper Session 2.4</u></b></p> <p><b>Agent-based computer models for learning about climate change and process analysis techniques</b> Nick Kelly, Michael Jacobson, Lina Markauskaite, Vilaythong Southavilay</p> <p><b>Using Heuristic Worked Examples and Collaboration Scripts to Help Learners Acquire Mathematical Argumentation Skills</b> Ingo Kollar, Stefan Ufer, Elisabeth Lorenz, Freydis Vogel, Kristina Reiss, Frank Fischer</p> <p><b>Automatically extract interpretable topics from online discussion</b> Yonghe Zhang, Nancy Law, Yanyan Li, Ronghuai Huang</p>	NL105
FP2.5	<p><b><u>Full Paper Session 2.5</u></b></p> <p><b>Inter-Identity Technologies for Learning</b> Robb Lindgren, Roy Pea</p> <p><b>Examining the Adequacy of Students' Priors and Teacher's Role in Attention to Critical Features in Designing for Productive Failure</b> Pee Li Leslie Toh, Manu Kapur</p> <p><b>Improving Revision in Wiki-based Writing: Coordination Pays off</b> Astrid Wichmann, Marina Becker, Nikol Rummel</p>	NL107
FP2.6	<p><b><u>Full Paper Session 2.6</u></b></p> <p><b>Peer Collaboration and Mediation in Elementary Students' Lamp Designing Process</b> Kaiju Kangas, Pirta Seitamaa-Hakkarainen</p> <p><b>Design Research in Early Literacy within the Zone of Proximal Implementation</b> Susan McKenney, Paul Kirschner, Joke Voogt</p> <p><b>Learning Innovation Diffusion as Complex Adaptive Systems through Model Building, Simulation, Game Play and</b></p>	NL115

ID	PARALLEL SESSION 2	Location
	<b>Reflections</b> Junsong Huang, Manu Kapur	
<b>SP2.2</b>	<b><u>Short Paper Session 2.2</u></b> <b>Improving Middle School Students' Understanding of Core Science Ideas Using Coherent Curriculum</b> Joseph Krajcik, Sung-Youn Choi, Namsoo Shin, LeeAnn M. Sutherland <b>Transformative Experiences and Biological Evolution: Facilitating Deep Engagement</b> Benjamin Heddy, Gale Sinatra <b>Physical Activity Data Use by Technoathletes: Examples of Collection, Inscription, and Identification</b> Victor Lee, Joel Drake <b>What to look for and what to do: Novice teachers' abilities for noticing and responding to their students' in-class inquiry</b> Loucas Louca, Thea Skoulia, Dora Tzialli <b>Scaffolding a Knowledge Community for High School Physics</b> Mike Tissenbaum, Jim Slotta <b>Developing a technology-enhanced scientific inquiry curriculum in a primary school: Outcomes of the School-Based Support</b> Yau-yuen Yeung, Zhihong Wan, Winnie Wing-mui So	<b>NL 117</b>

**PARALLEL SESSION 3 :: 14.30 - 16.00**

ID	PARALLEL SESSION 3	Location
<b>Sym3.5</b>	<b><u>Symposium 3.5</u></b> <b>Scripting Science Inquiry Learning in CSCL Classrooms</b> Annelies Raes, Tammy Schellens, Bram De Wever, Ingo Kollar, Christof Wecker, Frank Fischer, Mike Tissenbaum, Jim Slotta, Vanessa L. Peters, Nancy Songer	<b>EA Aud</b>
<b>Pst3.3</b>	<b><u>Poster Session 3.3</u></b> <b>The Role of Technologies in Facilitating Collaborative Engagement</b> Suparna Sinha, Karlyn Adams, Toni Kempler-Rogat, Cindy Hmelo-Silver <b>Synthesizing Quantitative Predictors for Interaction in an Asynchronous Online Course</b> Daniel Zingaro, Murat Oztok, Jim Hewitt <b>Engines of Representation: Processing Raw Student Data into Useable Student Information</b> Suzanne Rhodes, Halverson Richard <b>Improving Americans' Modest Global Warming Knowledge in the Light of RTMD (Reinforced Theistic Manifest Destiny) Theory</b> Michael Ranney, Dav Clark, Daniel Reinholz, Sarah Cohen <b>Integrating Insights from Critical Race and Queer Theories with Cultural-Historical Learning Theory</b> Indigo Esmonde, Miwa Takeuchi, Lesley Dookie <b>Iterative Technology-based Design with Deaf/Hard of Hearing Populations: Working with Teachers to Build a Better Educational Game</b> Brett Shelton, Mary Ann Parlin, Jon Scoresby, Vonda Jump, Claudia Pagliaro <b>Teacher-Education Students' Beliefs in Science Teaching in a Knowledge Building Environment</b> Chih-Hsuan Chang, Huang-Yao Hong <b>Investigating Teacher Change in Creating Classroom Knowledge Building Communities</b> Katerine Bielaczyc, Sunhee Paik, John Ow <b>Relationships between Representational Characteristics, Students' Education Levels, and Beliefs of Models</b> Silvia Wen-Yu Lee, Hsin-Yi Chang, Hsin-Kai Wu	<b>NL100</b>
<b>Sym3.6</b>	<b><u>Symposium 3.6</u></b> <b>The Use of Game Design, Social Learning Networks, and Everyday Expertise to Engage Youth with Contemporary Science</b>	<b>NL102</b>

ID	PARALLEL SESSION 3	Location
	Philip Bell, Leah Bricker, Katie Van Horne, Theresa Horstman, Nichole Pinkard	
FP3.7	<p><b><u>Full Paper Session 3.7</u></b></p> <p><b>Consequential Feedback as a Means of Supporting Student Engagement and Understanding</b> Melissa Gresalfi, Jacqueline Barnes</p> <p><b>Designing Video Games that Encourage Players to Integrate Formal Representations with Informal Play</b> Nathan Holbert, Uri Wilensky</p> <p><b>Alternate Reality Games: Platforms for Collaborative Learning</b> Elizabeth Bonsignore, Derek Hansen, Kari Kraus, June Ahn, Amanda Visconti, Ann Fraistat, Allison Druin Bonsignore</p>	NL105
FP3.8	<p><b><u>Full Paper Session 3.8</u></b></p> <p><b>A Teacher's Journey in Knowledge Building Pedagogy</b> Nancy Law, Johnny Yuen, Hidy Tse</p> <p><b>Students' Intuitive Understanding of Promisingness and Promisingness Judgments to Facilitate Knowledge Advancement</b> Bodong Chen, Marlene Scardamalia, Monica Resendes, Maria Chuy, Carl Bereiter</p> <p><b>Metadiscourse to Foster Student Collective Responsibility for Deepening Inquiry</b> Jianwei Zhang, Jiyeon Lee, Jane Wilde</p>	NL107
FP3.9	<p><b><u>Full Paper Session 3.9</u></b></p> <p><b>Using Innovation with Contrasting Cases to Scaffold Collaborative Learning and Transfer</b> Seungyon Ha, David A. Sears</p> <p><b>Exploring Connectedness: Applying ENA to Teacher Knowledge</b> Chandra Hawley Orrill, David Williamson Shaffer</p> <p><b>Using Adaptive Learning Technologies to Personalize Instruction: The Impact of Interest-Based Scenarios on Performance in Algebra</b> Candace Walkington, Milan Sherman</p>	NL115
SP3.3	<p><b><u>Short Paper Session 3.3</u></b></p> <p><b>Development and Validation of a Scale to Place Students along a Learning Progression</b> Namsoo Shin, Shawn Y. Stevens</p> <p><b>Towards Teaching Analytics: Repertory Grids for Formative Assessment</b> Ravi Vatrappu, Peter Reimann, Abid Hussain</p> <p><b>Scaffolding and Assessing Knowledge Building among Chinese Tertiary Students Using E-portfolios</b> Chunlin Lei, Carol K.K Chan</p> <p><b>The Knowledge connections Analyzer</b> Jan van Aalst, Carol Chan, Stella Tian, Christopher Teplovs, Yuan Chan, Wing-San Wan</p> <p><b>Bidirectional artifact analysis: A method for analyzing creative processes</b> Alecia Marie Magnifico, Erica Rosenfeld Halverson</p> <p><b>Audience Effects: A Bidirectional Artifact Analysis of Adolescents' Creative Writing</b> Alecia Marie Magnifico</p>	NL 117

AFTERNOON TEA :: 16.00 – 16.30 (CATERED)

**PARALLEL SESSION 4 :: 16.30 - 18.00**

ID	PARALLEL SESSION 4	Location
Sym4.7	<p><b><u>Symposium 4.7</u></b> – time change (this symposium is 2 hours long, finishing at 18.30)</p> <p><b>You're It! Body, Action, and Object in STEM Learning</b> Dor Abrahamson, David DeLiema, Cameron Fadjo, Michael Eisenberg, Carmen Petrick, Mina Johnson, Robb Lindgren</p>	EA Aud
Pst4.4	<p><b><u>Poster Session 4.4</u></b></p> <p><b>Argument-based Inquiry and Students with Disabilities: Improving Critical Thinking Skills and Science Understanding</b> Jonte Taylor, William Therrien, Brian Hand</p> <p><b>Fostering Teachers' Use of Talk Moves to Promote Productive Participation in Scientific Practices</b> William Penuel, Yves Beauvineau, Angela Haydel DeBarger, Savitha Moorthy</p> <p><b>Inquiry in the kindergarten science: Helping kindergarten teachers to implement inquiry-based teaching</b> Loucas Louca, Dora Tzialli, Constantinos Constantinou</p> <p><b>Combining knowledge and interaction perspectives to decipher learning during a clinical interview</b> Shulamit Kapon</p> <p><b>Asking for too much too early? Promoting mechanistic reasoning in early childhood science and mathematics education</b> Loucas Louca, Chrystalla Papademetri-Kachrimani</p> <p><b>SMILE smartphones in a university learning environment: a classroom response system</b> Celia Kaendler, Linus Feiten, Katrin Weber, Michael Wiedmann, Manuel Buehrer, Sebastian Sester, Bernd Becker</p> <p><b>Stability and Change in Achievement Goals and Transfer</b> Erkka Laine, Andreas Gegenfurtner</p> <p><b>Commercial Development of e-Learning Materials for Science and Mathematics Subjects in Hong Kong: Preliminary Evaluation</b> Yau-yuen Yeung, Irene Chung-man Lam</p> <p><b>Metacognizing across self and socio dialectics</b> Azilawati Jamaludin, David Hung</p>	NL100
Sym4.8	<p><b><u>Symposium 4.8</u></b></p> <p><b>The Future of Assessment: Measuring Science Reasoning and Inquiry Skills Using Simulations and Immersive Environments</b> Jodi Davenport, Edys Quellmalz, Jody Clarke-Midura, Chris Dede, Janice Gobert, Kenneth Koedinger, Marty McCall, Michael Timms</p>	NL102
FP4.10	<p><b><u>Full Paper Session 4.10</u></b></p> <p><b>Technology Supports in CSCL</b> Heisawn Jeong, Cindy Hmelo-Silver</p> <p><b>Initial Validation of Listening Behavior Typologies for Online Discussions Using Microanalytic Case Studies</b> Alyssa Friend Wise, Ying-Ting Hsiao, Farshid Marbouti, Jennifer Speer, Nishan Perera</p> <p><b>Using Controversies for Knowledge Construction: Thinking and Writing about Alternative Medicine</b> Joachim Kimmerle, Johannes Moskaliuk, Martina Bientzle, Ansgar Thiel, Ulrike Cress</p>	NL105
FP4.11	<p><b><u>Full Paper Session 4.11</u></b></p> <p><b>Functional Aesthetics for Learning: Creative Tensions in Youth e-Textile Designs</b> Deborah A. Fields, Yasmin B. Kafai, Kristin Searle</p> <p><b>Supporting Learners to Conceptualize the Vast Range of Imperceptible Smallness with Temporal-aural-visual Representations</b> Minyoung Song, Chris Quintana</p> <p><b>Making Technology Visible: Connecting the Learning of Crafts, Circuitry and Coding in E-textiles by Youth Designers</b> Yasmin Kafai, Deborah Fields, Kristin Searle</p>	NL107



ID	PARALLEL SESSION 4	Location
SP4.4	<p><b>Short Paper Session 4.4</b></p> <p><b>Bridging Design and Practice: Towards a Model-based Collaborative Inquiry Science Learning Environment</b> Daner Sun, Chee-kit Looi, Baohui Zhang</p> <p><b>Epistemic Mentoring in Virtual and Face-to-Face Environments</b> Elizabeth Bagley, David Williamson Shaffer</p> <p><b>The use of text and process mining techniques to study the impact of feedback on students' writing processes</b> Rafael Calvo, Anindito Aditomo, Vilaythong Southavilay, Kalina Yacef</p> <p><b>Learning by Collaborative Design and Evaluation</b> Shannon Kennedy-Clark, Vilma Galstaun, Martin Parisio, Kate Anderson</p> <p><b>Investigating Emergent Dynamics to Understand Interactions in Small Professional Development Groups</b> Susan Yoon</p> <p><b>Dimensions of scaffolding in technology-mediated discovery learning environments</b> Mark J. W. Lee, Barney Dalgarno</p> <p><b>Using the learner-generated drawing strategy: How much instructional support is useful?</b> Annett Schmeck, Luisa Amelie Friedrich, Maria Opfermann, Detlev Leutner</p>	NL115
SP4.5	<p><b>Short Paper Session 4.5</b></p> <p><b>Breeding Birds to Learn about Artificial Selection: Two Birds with One Stone?</b> Aditi Wagh Aditi Wagh, Uri Wilensky Uri Wilensky</p> <p><b>Establishing a Mathematical Practice in a Middle School Classroom</b> Marta Kobiela, Rich Lehrer</p> <p><b>Engaging in Design: Reflections of Young Paper Engineers</b> Rob Rouse, Richard Lehrer</p> <p><b>Learners as Informants of Educational Game Design</b> Beaumie Kim, Lynde Tan, Mi Song Kim</p> <p><b>Redesigning Classroom Learning Spaces: When technology meets pedagogy and when they clash</b> Elizabeth Charles, Nathaniel Lasry, Chris Whittaker</p>	NL 117
SS4.1	<p><b>ISLS sponsored Panel Session - linking learning sciences communities internationally</b></p> <p>The goal of this symposium is to provide an opportunity for ISLS members to learn more about Learning Sciences related research in different countries around the world, particularly from countries outside of North American and Western Europe, and to explore ways in which ISLS can contribute to enriching the field of Learning Sciences through expanding the international representation of its membership.</p> <p>Chair: Nancy Law. Speakers: Baohui Zhang, Konstantin K. Kolin, Paulo Blikstein, Miguel Nussbaum, Michael Jacobson</p> <p><i>This event will be followed by a reception in Hermann's Bar (on campus, across the walkway at City Road).</i></p>	EA116

## Smart Tools for Collaborations of the Future

**TableTop – surface computing software** provides a more natural way for dispersed teams to brainstorm, share, and collaborate on documents and images. Documents and images can be shared between TableTop, smartphones and tablets and can be projected onto walls or any convenient surface for presentations or as part of a creating a truly immersive environment.

**iSee video conferencing** provides users with a collaborative multipoint to multipoint immersive video-based meeting environment which operates from a standard computer, laptop, tablet or smartphone. Using live video feed users can meet face-to-face in a customised environment and interact in small or large groups (200+) in the same way that they would if together. (See our demonstration on Thursday afternoon - MP7.2.)

### For demonstration or information contact:

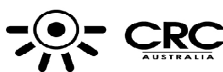
Warren Bradey – P: +61 2 8374 5083  
E: warren.bradey@smartservices.com.au



SMART SERVICES CRC



An Australian Government Initiative



**PROGRAM – THURS JULY 5**

A full day of events from 8.00 to 17.50, including a keynote and 4 parallel sessions, starting with a light breakfast at 8.00am. Please note the early finish to facilitate the Social Night and Cruise.

**BREAKFAST – 8.00 - 8.30 (CATERED)**

**KEYNOTE 3 :: JUDY KAY –SPONSORED BY NSW TRADE & INVESTMENT**

Judy's keynote will take place in the Eastern Avenue Auditorium (EA AUD) from 8.30am – 10.00am.

This talk presents a vision for lifelong learning as a driver for designing pervasive technologies. It does this via case studies for challenging long-term learning goals associated with health and wellness, collaboration to learn and learning to collaborate.



**Trade & Investment**

One strand of that vision involves the new learning interfaces across each learner's personal digital ecosystem of devices, ranging from mobiles, to desktops and embedded interactive surfaces on walls and tables. A second strand concerns the huge amounts of data that these devices can, and do, capture about learners. This takes diverse forms, including personal information, learning data and digital footprints. There is a huge and growing amount of this data. It lives across the personal digital ecosystem, on personal devices and in the cloud.

The talk illustrates the design of technologies to give this data to the learner at three levels. One concerns learner control over the capture and use of their data. Another involves data mining to transform it into new insights for the learner, their teachers and facilitators, and for education researchers. The final one is the design of interfaces such as in Open Learner Models to scaffold the learner's metacognitive activities of self-monitoring, self-reflection and planning.

**MORNING TEA :: 10.00 -10.15 (CATERED)**

**PARALLEL SESSION 5 :: 10.15 – 11.45**

ID	PARALLEL SESSION 5	Location
Sym5.9	<b><u>Symposium 5.9</u></b> <b>Instructional Approaches to Promote Conceptual Change</b> Stella Vosniadou Vosniadou, Naomi Miyake, Marcia Linn, Stellan Ohlsson, David D. Cosejo, Michael J. Jacobson, Doug Clark	EA Aud
Pst5.5	<b><u>Poster Session 5.5</u></b> <b>Matchballs: a casual game for learning and domain ontology enrichment</b> Sabrina Ziebarth, Nils Malzahn, H. Ulrich Hoppe <b>Becoming a Writer: Examining Preschoolers' Interactions, Modes of Participation, and Use of Resources at the Writing Center</b> Amy Gillespie, Deborah Rowe <b>Fifth and Seventh Graders' Patterns of Understanding About Cells and Heredity in a Technology-Enhanced Curriculum</b> Dante Cisterna, Michelle Williams, Joi Merritt <b>Design-Based Implementation Research of Spreadable Educational Practices within the Participatory Learning and Assessment Network (PLANet)</b> Rebecca Itow, Daniel Hickey <b>Challenges of teaching through web-based inquiry: A longitudinal case study of a veteran high school teacher</b> Eleni Kyza, Iolie Nicolaidou <b>Creating and sustaining online communities of practice for science teachers' professional development: Overcoming the barriers</b>	NL100

ID	PARALLEL SESSION 5	Location
	<p>Yiannis Georgiou, Eleni A. Kyza, Andri I. Ioannou</p> <p><b>Reasoning About Mechanism: Children's Explanations of Pop-ups</b> Mayumi Shinohara, Rob Rouse</p> <p><b>Resources for Reasoning: Use of Video and Text in a CSCL Environment</b> Cindy Hmelo-Silver, Carolyn Maher, Marjory Palius, Robert Sigley</p> <p><b>Social Network Analysis for Knowledge Building: Establishment of Indicators for Collective Knowledge Advancement</b> Jun Oshima, Yoshiaki Matsuzawa, Ritsuko Oshima, Carol Chan, Jan van Aalst</p>	
<b>Sym5.10</b>	<p><b><u>Symposium 5.10</u></b></p> <p><b>Hybrid spaces for science education</b> Ole Smørndal, Jim Slotta 2 3, Ingeborg Kränge, Tom Moher 7, Francesco Novellis, Alessandro Gnoli 7, Brenda Lopez Silva, Michelle Lui, Alfredo Jornet, Cecilie F. Jahreie</p>	<b>NL102</b>
<b>Sym5.11</b>	<p><b><u>Symposium 5.11</u></b></p> <p><b>Gathering Evidence of Scientific Argumentation Practices: From Pre-Kindergarten to High School</b> Tiffany Lee, Hiroki Oura, Giovanna Scalone, Kari Shutt, John Bransford, Andrew Shouse, Katie Van Horne, Nancy Vye, Maureen Munn, Randy Knuth</p>	<b>EA116</b>
<b>FP5.12</b>	<p><b><u>Full Paper Session 5.12</u></b></p> <p><b>Learning Progressions, Learning Trajectories, and Equity</b> Cesar Delgado, Karisma Morton</p> <p><b>The impact of students' exploration strategies in discovery-based instructional software</b> Barney Dalgarno, Gregor Kennedy, Sue Bennett</p> <p><b>Kitchen Chemistry: Supporting Learners' Decisions in Science</b> Jason Yip, Tamara Clegg, Elizabeth Bonsignore, Helene Gelderblom, Becky Lewittes, Mona Leigh Guha, Allison Druin</p>	<b>NL105</b>
<b>FP5.13</b>	<p><b><u>Full Paper Session 5.13</u></b></p> <p><b>Toward a Cognitive Framework of Interdisciplinary Understanding</b> Shannon Sung, Ji Shen, Dongmei Zhang</p> <p><b>A Microgenetic Analysis of How Expansive Framing Led to Transfer with One Struggling Student</b> Diane Lam, Xenia Meyer, Randi A. Engle, Lloyd Goldwasser, Kathleen Zheng, Erica Naves, Danny Tan, Richard Hsu, Hernan Rosas, Sarah Perez</p> <p><b>Unpacking the Use of Talk and Writing in Argument-based Inquiry: Instruction and Cognition</b> Ying-Chih Chen, Soonhye Park, Brian Hand</p>	<b>NL107</b>
<b>FP5.14</b>	<p><b><u>Full Paper Session 5.14</u></b></p> <p><b>Investigating the Effects of Varying Labels as Scaffolds for Visitor Learning</b> Joyce Wang, Susan Yoon, Karen Elinich, Jackie Van Schooneveld</p> <p><b>Working with teenagers to design technology that supports learning about energy in informal contexts</b> Katerina Avramides, Brock Craft, Rosemary Luckin, Janet Read</p> <p><b>Young Children's Everyday Inquiry: A Field Study of a Young Girl's Play Across Contexts</b> Danielle Keifert</p>	<b>NL115</b>
<b>SP5.6</b>	<p><b><u>Short Paper Session 5.6</u></b></p> <p><b>How a power game shapes expressing opinions in a chat and in an argument graph during a debate: A case study</b> Gaelle Molinari, Kristine Lund</p> <p><b>Unpacking traces of collaboration from multimodal data of collaborative concept mapping at a tabletop</b> Roberto Martinez Maldonado, Judy Kay, Kalina Yacef, Beat Schwendimann</p> <p><b>Understanding influence in collaborative group work: The importance of artifacts</b> Lesley Dookie, Indigo Esmonde</p> <p><b>Scaffolding Collaborative Sensemaking during Critique of Explanations in Technology-Enhanced Science Curriculum</b> Elissa Sato, Vanessa Svihla</p> <p><b>The teacher's balance between structure and flexibility in the technology-enhanced collaborative inquiry setting</b> Marjut Viilo, Pirita Seitamaa-Hakkarainen, Kai Hakkarainen</p>	<b>NL 117</b>

ID	PARALLEL SESSION 5	Location
	<b>Multi-Touch Technology to Support Multiple Levels of Collaborative Learning in the Classroom</b> Emma Mercier, Steve Higgins, Elizabeth Burd, Andrew Joyce-Gibbons	

**LUNCH BREAK :: 11.45 - 12.45 (NOT CATERED)**

Lunches are not catered but there are plenty of options nearby. (See the provided Rough Guide to Sydney for suggestions.)

ID		Location
M4	<b>Closed meeting</b> – Educational Psychologist Board Meeting	EA 116
M5	<b>Closed meeting</b> – ISLS Membership Committee	EA 115
M6	<b>Closed meeting</b> - ISLS Education Committee	EA 119

**PARALLEL SESSION 6 :: 12.45 – 14.15**


ID	PARALLEL SESSION 6	Location
<b>Sym6.12</b>	<b><u>Symposium 6.12</u></b> <b>Robot Facilitation as Dynamic Support for Collaborative Learning</b> Naomi Miyake, Sandra Okita, Carolyn Rose	<b>EA Aud</b>
<b>Pst6.6</b>	<b><u>Poster Session 6.6</u></b> <b>Weaving together parts to achieve a whole: Gestural activity for the coordination of information in the teaching and learning of chemistry</b> Stephanie Scopelitis, Mike Stieff <b>Participatory Learning and Assessment in e-Learning Contexts</b> Daniel Hickey, Andrea Strackeljahn, Rebecca Itow <b>Irreducible Complexity: How Do Causal Bayes Nets Theories of Human Causal Inference Inform the Design of a Virtual Ecosystem?</b> M. Shane Tutwiler, Tina Grotzer <b>From tacit knowing to explicit explanation: Mining student designs for evidence of systems thinking</b> Melissa Gresalfi, Leon Gordon, Sinem Siyahhan <b>The Authority of Ideas: How Students Become Influential in Linguistically Heterogeneous Small Group Discussions</b> Jennifer Langer-Osuna <b>Understanding Teachers' Cultural Models about Technology</b> Jen Scott Curwood <b>Ontological Stances and Systems Thinking in the Favela and Asfalto</b> Izabel Duarte Olson <b>Picture-Based Science Attitudes Assessment</b> Emily Johnson, Amy Bolling, Robb Lindgren <b>Alternative Spaces for Engagement: Performance and conversation in the Connected Classroom</b> Rachel Perry, Matthew Kearney	<b>NL100</b>
<b>Sym6.13</b>	<b><u>Symposium 6.13</u></b> <b>Assessing Interests in the Service of Supporting Personalized Learning Through Networked Resources</b> Brigid J. Barron, Robert B. W. Ely, Mary D. Ainley, K. Ann Renninger	<b>NL102</b>



ID	PARALLEL SESSION 6	Location
FP6.15	<p><b><u>Full Paper Session 6.15</u></b></p> <p><b>A Data-driven Path Model of Student Attributes, Affect, and Engagement in a Computer-based Science Inquiry Microworld</b> Arnon HersHKovitz, Ryan Baker, Janice Gobert, Adam Nakama</p> <p><b>Dynabook: Supporting Teacher Learning about Mathematical Thinking</b> Jeremy Roschelle, Charles Patton, Elizabeth Murray</p> <p><b>Re-presenting Complex Scientific Phenomena Using Agent-Based Modeling in Engineering Education</b> Paulo Blikstein</p>	NL105
FP6.16	<p><b><u>Full Paper Session 6.16</u></b></p> <p><b>Using the Idea Manager to Promote Coherent Understanding of Inquiry Investigations</b> Kevin McElhaney, Camillia Matuk, David Miller, Marcia Linn</p> <p><b>Finding Voices and Emerging Agency in Classroom Learning</b> Tuck Leong Lee, Beaumie Kim, Mi Song Kim, Jason Wen Yau Lee</p> <p><b>Distributing Practice: Challenges and Opportunities for Inquiry Learning</b> Vanessa Svihla, Marcia Linn</p>	NL107
MP6.1	<p><b><u>Mixed Paper Session 6.1 (2 long, 2 short)</u></b></p> <p><b>Beyond the screen: game-based learning as a nexus of identification (full paper)</b> Ben DeVane</p> <p><b>The interplay of chance and skill: Exploiting a common game mechanic to enhance learning and persistence (full paper)</b> Catherine Chase</p> <p><b>Supporting computational thinking by modding strategic board games (short paper)</b> Matthew Berland, Sean Duncan, Melanie Boecking, Erin Price Tiger</p> <p><b>ChemVLab+: Evaluating a Virtual Lab Tutor for High School Chemistry (short paper)</b> Jodi Davenport, Anna Rafferty, Michael Timms, David Yaron, Michael Karabinos</p>	NL115
SP6.7	<p><b><u>Short Paper Session 6.7</u></b></p> <p><b>Language Formality, Learning Environments, and Student Achievement</b> Emily Schoerning, Brian Hand</p> <p><b>Unraveling Idea Development in Discourse Trajectories</b> Iassen Halatchliyski, Aileen Oeberst, Martina Bientzle, Franziska Bokhorst, Jan van Aalst</p> <p><b>Identity and digital media production in the college classroom</b> Erica Halverson, Michelle Bass</p> <p><b>High school students' epistemic engagement in producing documentaries about public science concerns</b> David J. DeLiema, Jarod N. Kawasaki, William A. Sandoval</p> <p><b>Explanandum and visibility condition change children's gesture profiles during explanation: implications for learning?</b> Audrey Mazur-Palandre, Kristine Lund</p> <p><b>Two Models of Authenticity: Signature Pedagogy, Problem Based Learning, and Cultural Context</b> Moshe Krakowski</p>	NL 117

**PARALLEL SESSION 7 :: 14.30 - 16.00**

ID	PARALLEL SESSION 7	Location
Sym7.15	<p><b><u>Symposium 7.15</u></b></p> <p><b>Everyday Interactions and Activities: Field Studies of Early Learning Across Settings</b> Reed Stevens, Lauren Penney, Danielle Keifert, Pryce Davis, Siri Mehus, Rich Lehrer</p>	EA Aud
Pst7.7	<p><b><u>Poster Session 7.7</u></b></p> <p><b>Connecting Visitors to Exhibits through Design: Exploring United States census data with CoCensus</b> Jessica Roberts, Leilah Lyons, Joshua Radinsky, Francesco Cafaro</p> <p><b>Methods of analysis for identifying patterns of problem solving processes in a computer-supported collaborative environment</b> Shannon Kennedy-Clark, Kate Thompson</p> <p><b>An Eye For Detail: Techniques For Using Eye Tracker Data to Explore Learning in Computer-Mediated Environments</b> Marcelo Worsley, Paulo Blikstein</p> <p><b>Finding the Common Thread: Learners' Intuitive Knowledge of General Patterns that Apply Across Domains</b> Hillary Swanson</p> <p><b>A case study of P2PU: New models for open and peer-focused learning</b> Monica Resendes, Stian Haklev</p> <p><b>UltraLite Collaboration: A Low-Cost Toolkit to Promote Collaborative Learning in the Classroom</b> Claire Rosenbaum, Paulo Blikstein, Patti Schank, Ken Rafanan, Jeremy Roschelle</p> <p><b>Learning to Graph: A Comparison Study of Using Probe or Draw Tools in a Web-Based Learning Environment</b> Libby Gerard, Amber Zertuche, Marcia Linn</p> <p><b>Bifocal Biology: Using Bifocal Modeling to Support Inquiry into Real and Ideal Systems</b> Tamar Fuhrmann, Daniel Greene, Shima Salehi, Paulo Blikstein</p> <p><b>Design-Based Research in Practice: A technology-based classroom experiment that explores how students use virtual manipulatives to order groups of fractions</b> Maria Mendiburo, Gautam Biswas, Ted Hasselbring</p> <p><b>Developing Students' Disciplinary Historical Thinking: The Role of Textual and Instructional Resources</b> Kimberly Scott, Kimberly Gomez, Shaundra Daly</p>	NL100
Sym7.15	<p><b><u>Symposium 7.15</u></b></p> <p><b>Building Bridges between Learning Analytics, Educational Data Mining and Core Learning Sciences Perspectives</b> Paulo Blikstein, Marcelo Worsley, Bruce Sherin, Ryan Baker, Matthew Berland, Taylor Martin, Ido Roll, Vincent Aleven, Ken Koedinger, Arnon Hershkovitz</p>	NL102
FP7.17	<p><b><u>Full Paper Session 7.17</u></b></p> <p><b>Dilemmas of Promoting Expansive Educational Transformation through Information and Communication Technologies (ICTs) in Botswana</b> Tshepo Batane, Ritva Engeström, Kai Hakkarainen, Denise Newnham, Paul Nleya, Jaakko Virkkunen</p> <p><b>Semiosis process in joint didactic action</b> Gérard Sensevy, Dominique Forest</p> <p><b>Technology for Learning: Moving from the Cognitive to the Anthropological Stance</b> Michael Eisenberg</p>	NL105
FP7.18	<p><b><u>Full Paper Session 7.18</u></b></p> <p><b>The Impact of Structural Characteristics of Concept Maps on Automatic Quality Measurement</b> H. Ulrich Hoppe, Jan Engler, Stefan Weinbrenner</p> <p><b>Exploratory Study on the Physical Tool-based Conceptions of Learning of Young Students in a Technology-Rich Primary School</b> Lung-Hsiang Wong, Mingfong Jan, Yancy Toh, Ching-Sing Chai</p> <p><b>Visible Spending: Information Visualization of Spending Behavior and the Thought-Act Gap</b> Emily S. Lin, Holly A. Taylor</p>	NL107

ID	PARALLEL SESSION 7	Location
Sym7.14	<b><u>Symposium 7.14</u></b> <b>Embedded Phenomena for Knowledge Communities: Supporting complex practices and interactions within a community of inquiry in the elementary science classroom</b> Rebecca Cober, Cresencia Fong, Alessandro Gnoli, Brenda López Silva, Michelle Lui, Cheryl Madeira, Colin McCann, Tom Moher, Jim Slotta, Mike Tissenbaum	NL115
SP7.8	<b><u>Short Paper Session 7.8</u></b> <b>Learning from the folly of others: Learning to self-correct by monitoring the reasoning of projective pedagogical agents</b> Sandra Okita, Azadeh Jamalian <b>Effects of Computer-Supported Collaboration Scripts on Domain-Specific and Domain-General Learning Outcomes: A Meta-Analysis</b> Freydis Vogel, Ingo Kollar, Frank Fischer <b>The SunBay Digital Mathematics Project: An Infrastructural and Capacity-Based Approach to Improving Mathematics Teaching and Learning at Scale</b> Charles Vanover, George Roy, Zafer Unal, Vivian Fueyo, Phil Vahey <b>Measuring Sophistication of Epistemic Beliefs Using Rasch Analysis</b> Johan van Strien, Monique Bijker, Saskia Brand-Gruwel, Henny P. A. Boshuizen <b>Locating the Development of Interest: Tools for Studying the Mutual Constitution of Persons and Cultural Practices in Places</b> William Penuel, John H. Falk, Lynn D. Dierking, Ben Kirshner, Julie Haun-Frank, Adam J. York <b>Motivation in the Learning Sciences: Connecting to Practice by Design</b> Phillip Herman, Peter Wardrip, Jolene Zywica	NL 117
MP7.2	<b><u>Mixed Paper &amp; Trade demonstration 7.2</u></b> <b>iSee Video Collaboration and Learning</b> A demonstration by Graeme Booker of Smart Services CRC  <b>Facilitating the development of conceptual understanding in instruction about electrical circuits: Combining traditional instruction and simulation-based inquiry learning</b> Bas Kollöffel, Ton de Jong <b>Flow in Learning: Observable and Inducible</b> Eric Hamilton, Andrew Hurford	EA116

AFTERNOON TEA :: 16.00 – 16.20 (CATERED, NOTE SHORTER TIME)

## PRESIDENTIAL SESSION :: SS8.2 :: 16.20 – 17.50

The Presidential Session on the Future of Learning and the Learning Sciences will take place in the Eastern Avenue Auditorium (EA AUD) from 16.20 – 17.50.

In keeping with the ICLS 2012 Conference theme, the Future of Learning, this invited session features four representatives of the Learning Sciences community who will present their visions of the future. The panelists span several generations, countries, and areas of interest. Participants are Louis Gomez, Naomi Miyaki, Nichole Pinkard, and Nikol Rummel. Following their presentations, the panelists and audience will engage in a dialogue about the future.

Susan R. Goldman, President of ISLS, will chair the session.

- |   |                                       |
|---|---------------------------------------|
| ❖ Improvement? The next Wave in the Learning Sciences | Louis M. Gomez, UCLA                  |
| ❖ Renovating education of the future: Three scenarios | Naomi Miyake, University of Tokyo     |
| ❖ Connecting Learning Through Learning Pathways       | Nichole D. Pinkard, DePaul University |
| ❖ Exploring new spaces without reinventing the wheel  | Nikol Rummel, Ruhr-Universität Bochum |

Please note the early finish to facilitate delegates attending the social night dinner and cruise.

**SOCIAL NIGHT CRUISE :: 19.00 – 22.30**

We have chartered a Sydney showboat for our exclusive use - join us for all-inclusive three-hour cruise on Sydney Harbour with dinner, drinks and an evening's entertainment.

**Attendees will need to make their way to King St Wharf 2 for 7pm.** The cruise leaves from Darling Harbour at 7.15pm sharp, and once it has sailed the only option for redeavouring with it is hiring a water taxi, which will be in the region of \$80-200 dollars. We can not delay the sailing of the cruise. The cruise will end at approximately 10.30pm.

**Directions :** King St Wharf is 4kms from the University, and 2 from Central Station.

- ❖ If taking a cab from the University/Central Station area allow at least 25/30 minutes as this is peak-hour traffic and cabs may be delayed. Ask for the King St Wharfs, and to be dropped off on Lime St and Erskine St. You can book via Taxis Combined at <http://www.taxiscombined.com.au/index.htm> or 13 10 08, or most hotels will also be happy to book or call a cab.
- ❖ If you are taking public transport, the wharf is 10 mins walk from nearby Wynyard Train Station. Take the York Street exit then walk down Erskine Street towards Darling Harbour.
- ❖ Many buses will also drop you at Wynyard Station. The 412 and 413 go directly along George St to the wharf.
- ❖ Visit [131500.com](http://131500.com) to plan your journey by public transport. Please note that peak hour trains often experience some small delays or cancellations, and plan your journey accordingly.

If you arrive early at the King St Wharf, there are plenty of nearby cafes and bars to while away the spare time, and boarding will be permitted from as early as possible.

Registration and payment for the cruise takes place through the main conference registration system at a cost of \$90 per person. Some tickets may also be available at the conference, see the information desk for details.

**YOUR DELEGATE BADGE IS REQUIRED FOR ADMISSION TO ALL EVENTS, INCLUDING SOCIAL EVENTS AND WORKSHOPS. PLEASE WEAR YOUR BADGE AT ALL TIMES.**







# Routledge

at the **International Conference of the Learning Sciences 2012**



## Journal of the Learning Sciences

*Official Journal of The International Society of the Learning Sciences*

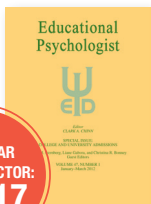
**EDITORS-IN-CHIEF:** Cindy E. Hmelo-Silver, Rutgers University, USA and Yasmin B. Kafai, University of Pennsylvania, USA

The **Journal of the Learning Sciences** provides a multidisciplinary forum for the presentation of research on learning and education. The journal seeks to foster new ways of thinking about learning that will allow our understanding of cognition and social cognition to have impact in education. It publishes research articles that advance our understanding of learning in real-world situations and of promoting learning in such venues, including articles that report on the roles of technology can play in promoting deep and lasting learning. The **Journal of the Learning Sciences** promotes engaging and thoughtful participation in learning activities, and articles reporting on new methodologies that enable rigorous investigation of learning in real-world situations.

**FIVE-YEAR  
IMPACT FACTOR:  
3.644**

[www.tandfonline.com/HLNS](http://www.tandfonline.com/HLNS)

## Journals of Related Interest



### **Educational Psychologist**

*Official Journal of Division 15 -- Educational Psychology, a Division of the APA*

**EDITOR:** Clark A. Chinn, Rutgers University, USA  
[www.tandfonline.com/HEDP](http://www.tandfonline.com/HEDP)

**FIVE-YEAR  
IMPACT FACTOR:  
5.0217**



### **Mind, Culture, and Activity**

**EDITORS:** Martin Packer, Duquesne University, USA, Jorge Larreamendy, Universidad de los Andes, Colombia, Andy Blunden, Independent Social Research Network, Australia

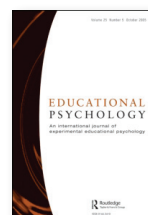
[www.tandfonline.com/HMCA](http://www.tandfonline.com/HMCA)



### **Cognition and Instruction**

**EDITOR-IN-CHIEF:** Andrea A. diSessa, University of California, Berkeley, USA

[www.tandfonline.com/HCGI](http://www.tandfonline.com/HCGI)



### **Educational Psychology**

*An International Journal of Experimental Educational Psychology*

**EDITOR:** Magdalena Mo Ching Mok, The Hong Kong Institute of Education, Hong Kong

[www.tandfonline.com/CEDP](http://www.tandfonline.com/CEDP)

**PROGRAM – FRI JULY 6**

A half day of events, including a keynote, 1 parallel sessions and the closing ceremony.

**BREAKFAST – 8.00 - 8.30 (CATERED)**
**KEYNOTE 4 :: PIERRE DILLENBOURG :: 8.30-10.00**

Pierre's keynote takes place in the Eastern Avenue Auditorium (EA AUD) from 8.30am – 10.00am.

**Classroom orchestration: interweaving digital and physical workflows**

Why should students login in an educational tool? The problems that occur at login time may take 2 or 3 minutes, which wastes 5% of the lesson time. Do the functionalities enabled by the login compensate this loss by 5% additional learning gains?

This anecdote illustrates the practical flavor of 'classroom orchestration'. I will argue that learning sciences should not only investigate how people learn but also how teachers manage multiple constraints such as time, discipline, physical space, etc... what Nussbaum called the 'logistics' of schools. Some principles emerged for reducing orchestration load: flexibility, control, visibility, physicality and minimalism. They constitute what I refer to as 'modest computing'. But, how to turn this set of anecdotes, examples or principles into the beginning of a theory? One step forward consists in modeling a classroom as two semi-mirrored workflows, a digital and a physical, connected by a certain number of contact nodes. For instance, our experience is that paper-based interfaces are effective orchestration tools, probably because they implement these dual workflows. These findings are close to Hutchins' analysis of the relevance of paper cards in the information flows of an aircraft cockpit. The complexity we face is that, in the context of a classroom, the pilot is alone and he has to serve food to all passengers.

**MORNING TEA - 10.00 -10.15 (CATERED)**
**PARALLEL SESSION 9 :: 10.15 – 11.45**

ID	PARALLEL SESSION 9	Location
Sym9.17	<b><u>Symposium 9.17</u></b> <b>Supporting teachers in capturing and analyzing learning data in the technology-rich classroom</b> Peter Reimann, Friedrich Hesse, Gabriele Cerniak, Rose Luckin, Ravi Vatrappu, Susan Bull, Matthew Johnson, Wolfgang Halb, Wilfrid Utz, Michal Kossowski	EA Aud
MP9.3	<b><u>Mixed Papers 9.3</u></b> <b>What a Long Strange Trip It's Been: A Comparison of Authors, Abstracts, and References in the 1991 and 2010 ICLS Proceedings</b> Victor Lee, Lei Ye, Mimi Recker (short) <b>Contribution of Motivational Orientations to Student Outcomes in a Discovery-Based Program of Game Design Learning</b> Rebecca Reynolds, Ming Ming Chiu (short) <b>Embodied Artifacts and Conceptual Performances</b> Dragan Trninic, Dor Abrahamson (Full) <b>How to schedule multiple graphical representations? A classroom experiment with an intelligent tutoring system for fractions</b> Martina Rau, Nikol Rummel, Vincent Alevan, Laura Pacillo, Zelha Tunc-Pekkan (full)	NL100
Sym9.18	<b><u>Symposium 9.18</u></b> <b>Interactive Surfaces and Spaces: A Learning Sciences Agenda</b> Michael A. Evans, Jochen Rick, Michael Horn, Chia Shen, Emma Mercier, James McNaughton, Steve Higgins, Mike Tissenbaum, Michelle Lui, James D. Slotta	NL102

ID	PARALLEL SESSION 9	Location
FP9.20	<p><b><u>Full Paper Session 9.19</u></b></p> <p><b>How metacognitive awareness caused a domino effect in learning</b> Kristin Schmidt, Andreas Lachner, Björn Stucke, Sabine Rey, Cornelius Frömmel, Matthias Nöckles</p> <p><b>Predicting Idea Co-Construction in Speech Data using Insights from Sociolinguistics</b> Gahgene Gweon, Mahaveer Jain, John McDonough, Bhiksha Raj, Carolyn Rose</p> <p><b>Teacher Paradigm Shifts for 21st Practice Skills: The Role of Scaffolded Reflection Within A Peer Community</b> Cheryl-Ann Madeira, Jim Slotta</p>	NL105
SP9.9	<p><b><u>Short Paper Session 9.9</u></b></p> <p><b>Effects of Argumentation Scaffolds and Problem Representation on Students' Solutions and Argumentation Quality in Physics</b> Carina M. Rebello, Eleanor Sayre, N. Sanjay Rebello</p> <p><b>Characterizing Collaboration with Metapragmatics: Using PreK Virtual Manipulatives on a Multi-Touch Tableto</b> Michael Evans, Kamala Russell, Michaela Hnizda, David McNeill</p> <p><b>Variation in Fifth Grade Students' Propensities for Managing Uncertainty during Collaborative Engineering Projects</b> Michelle Jordan</p> <p><b>Tracing Ideas and Participation in an Asynchronous Online Discussion across Individual and Group Levels over Time</b> Alyssa Friend Wise, Ying-Ting Hsiao, Farshid Marbouti, Yuting Zhao</p> <p><b>Mathematics Learning in a Racial Context: Unpacking Students' Reasoning about Asians are Good at Math</b> Niral Shah</p> <p><b>Examining system dynamics models together: Using variation theory to identify learning opportunities in online collaboration</b> Anindito Aditomo, Kate Thompson, Peter Reimann</p>	NL115
SP9.10	<p><b><u>Short Paper Session 9.10</u></b></p> <p><b>Supporting Student Learning using Conversational Agents in a Teachable Agent Environment</b> James Segedy, John Kinnebrew, Gautam Biswas</p> <p><b>New Evidence on Productive Failure - Building on Students' Prior Knowledge is Key!</b> Katharina Westermann, Rummel Nikol</p> <p><b>Theoretical Issues: Indicators of Decentralized and Centralized Causality as a Gauge for Students Understanding of Complex Systems</b> Lauren Barth-Cohen</p> <p><b>Changing Explanations about Sand Dune Movement</b> Lauren Barth-Cohen</p> <p><b>Multiple solutions and their diverse justifications to the service of learning in early geometrical problem solving</b> Naomi Prusak, Rina Hershkowitz, Baruch Schwarz</p> <p><b>The role of gesture in solving spatial problems in STEM</b> Matthew Lira, Mike Stieff, Stephanie Scopelitis</p>	NL 117

## CLOSING CEREMONY AND AWARDS :: 11.45 – 12.30

The closing ceremony and awards will take place in the Eastern Avenue Auditorium (EA AUD).

## LOCATION AND LOGISTICS

The University of Sydney is located 2kms from Sydney Central Train Station, and 3kms from the city centre at Town Hall and Martin Place (referred to as the Central Business District, or CBD). It is approximately 8kms to Sydney's airport.

The University is within a 10-15 minute walk of the café/nightlife areas of Glebe, Erskineville and Newtown, and well serviced by public transport.

## GETTING HERE

**By train :** Catch a train to Redfern Station. It then takes a 10-minute walk to the main campus.

**By bus from the city :** For stops on City Road (closest to the conference) catch routes 422, 423, 426, 428 from Castlereagh Street or Railway Square.

For stops on Parramatta Road side catch routes 412, 413, 435, 436, 437, 438, 440, 461, 480 from George Street or Railway Square.

Visit [131500.com](http://131500.com) for further public transport information.

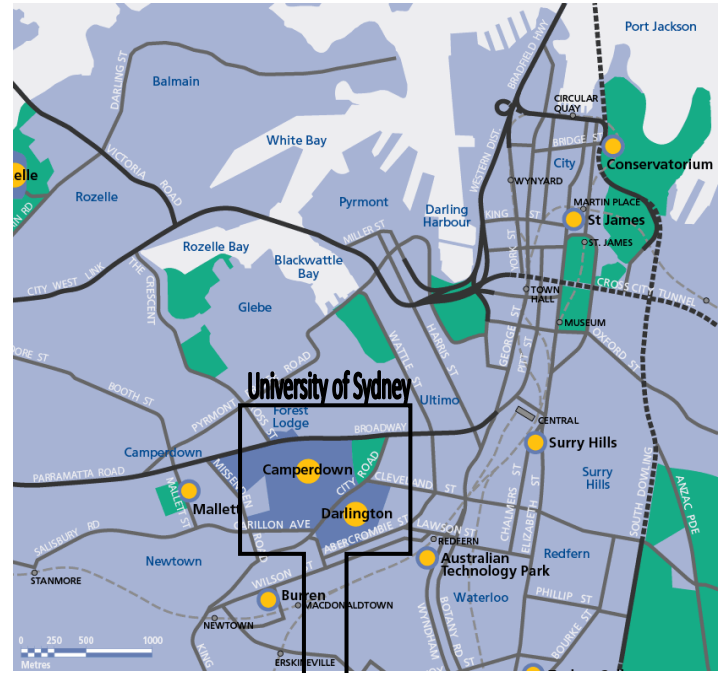
**Conference Locations on the University map below are marked with a colored arrow. Mini-maps are also available at the conference information desk.**

Tuesday night Gala –  
(the Holme Building)

Pre-conference  
Workshops (Education  
Building/School of IT)

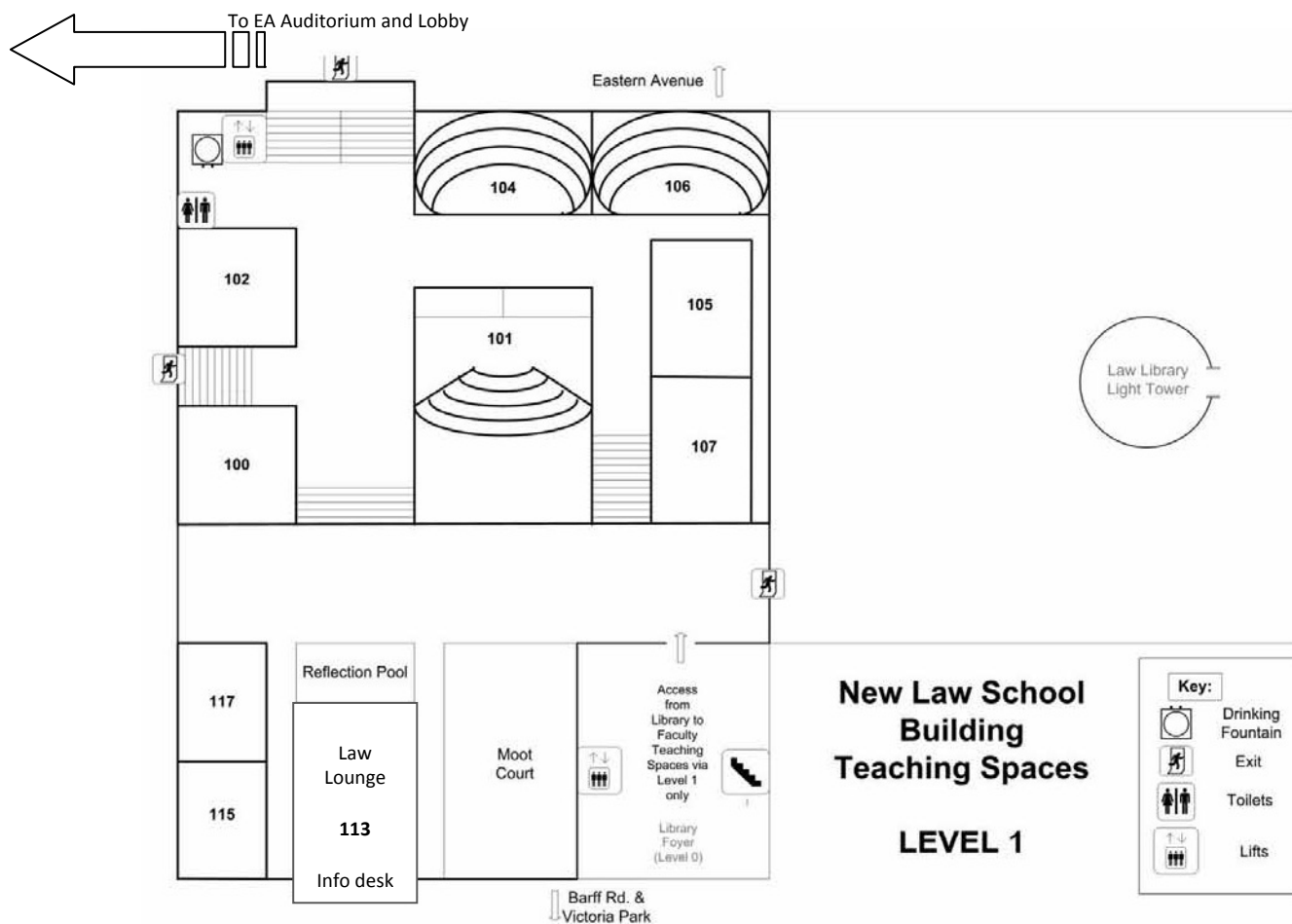
Main conference  
(Eastern Avenue and  
New Law complexes)

Worried about getting  
lost? We recommend  
downloading Lost on  
Campus, an app that  
helps you find your way  
about Australia's  
Universities.





## NEW LAW BUILDING MAP



## CONTACTS/IT ON CAMPUS

- University Security Service: dial 1 3333 from an internal phone or (02) 9351-3333 from a mobile
- Police, Fire, Ambulance: dial 000
- Conference information - our information/registration desk will be manned in room 112 (the Law Lounge) during main conference hours (15.00 – 17.00 Tues, 8.30 – 17.00 Weds/Thurs, 8.30 – 10.00 Fri). Call in if you need assistance.
- University information – The University Information Centre is located under the Clocktower in the Quadrangle. Phone: +61 2 9351 3100 Email: [info.centre@sydney.edu.au](mailto:info.centre@sydney.edu.au)

☞ Wireless access is available to delegates while on campus. To access:

1. Find the Usyd-Guest network with your device
2. Put in the password "Sydney2011" when prompted
3. Then input guest account user name : ICLS
4. And guest account password : wxFD7maW

Want to keep an eye on the conference as it progresses? Follow [@CoCoCentre](#) on Twitter, or the [#ICLS2012](#) hashtag.



## USEFUL WEBSITES AND APS

- Sydney public transport trip planning (trains, ferries and buses) - <http://131500.com/> (also has an app)
- Taxis Combined – book a taxi in Sydney <http://www.taxiscombined.com.au> (also has an app)
- Sydney Airport - <http://www.sydneyairport.com.au/>



- Worried about finding your way around the University? Download Lost on Campus, an app that makes finding your way too easy, as Aussies like to say. [lostoncampus.com.au/](http://lostoncampus.com.au/)
- University of Sydney - <http://sydney.edu.au/>

## EATING AND DRINKING

Your registration includes: food and drink at the Gala Night on Tuesday; breakfast, morning and afternoon tea on Wednesday and Thursday; and breakfast and morning tea on Friday.

Lunches are not catered at ICLS but there are plenty of options nearby where you can get a bite to eat. There are several options with 2 minutes walk of the conference. There are coffee stands nearby that also do sandwiches (watch out for the white roofs) and a café in the New Law building. The Manning Building on Manning Road on campus has a food court on the ground floor, as does the Student Union Building across the City Road (use the overhead walkway just past the EA building). You can find information on food on campus options at [http://sydney.edu.au/current\\_students/life/food.shtml](http://sydney.edu.au/current_students/life/food.shtml)

In addition, ICLS is situated near Glebe and Newtown. Glebe Point Road is 5 minutes walk from the conference, and lined with over 30 cafes and restaurants. Many offer lunch specials; try @Home for Thai, Mamak Village for Malaysian, or Teru, Clipper Café and Badde Manors for a café lunch. The Broadway Shopping Mall also has a fast-food court on level 3.

Missenden Road and King St in Newtown are both lined with cafes so there is no shortage of places to eat. Recommended are Thai Riffic, Newtown Thai, Newtown Thai 2, Guzman y Gomez Taqueria, and Burgerlicious, but almost everywhere in Newtown will do a good lunch for a reasonable price.

If you would like more suggested on where to eat and what to see while in Sydney, the conference hosts, CoCo, have put together a Rough Guide to Sydney with some suggestions, available both through the website and with delegate badges.

FUTURE CHALLENGES SUSTAINABLE FUTURES

  
ascilite

25TH - 28TH NOVEMBER 2012  
WELLINGTON



MASSEY UNIVERSITY  
TE KUNENGA KI PŪREHUROA  
UNIVERSITY OF NEW ZEALAND



**SYDNEY & NEW SOUTH WALES**

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[sydneyaustralia.com](http://sydneyaustralia.com)



Date	Time	Venue
<b>Mon 2<sup>nd</sup></b>	<b>Pre-conference workshops</b> (optional, registration required) including the Doctoral Consortium & Early Career Workshops	8.30 - 17.30 Education Building (ED)
<b>Tues 3<sup>rd</sup></b>	<b>Pre-conference workshops</b> (optional, registration required) including the Doctoral Consortium & Early Career Workshops	8.30 - 13.00 Education Building (ED)
	<b>Closed meeting</b> JLS Board (13.30 -15.00); ijCSCL Board (15.00-16.30)	13.00 – 16.30 ED408; EA116
<b>Main Conference begins Tuesday July 2nd at 16.30</b>		
	<b>Registration opens*</b>	15.00 – 16.30 EA Auditorium lobby
	<b>Opening session and Keynote 1</b> – Janet Kolodner	16:30 - 18:30 EA Auditorium (EA Aud)
	<b>ICLS Opening Gala Night</b> Cocktail and canapé reception	18.30 – 21.30 Holmes Refectory
<b>Wed 4<sup>th</sup></b>	<b>Opening session and Keynote 2</b> – Manu Kapur Followed by morning tea from 10.00-10.15	8:30 - 10:00 EA Aud
	<b>Parallel Session 1**</b> Followed by lunch break (not catered) from 11.45-12.45	10:15 - 11:45 EA Aud and New Law rooms (NL)
	<b>Closed meeting – ISLS Board</b>	11.45 – 12.45 EA116
	<b>Parallel Session 2**</b>	12.45 - 14.15 EA Aud and NL
	<b>Parallel Session 3**</b> Followed by afternoon tea from 16.00 - 16.30	14.30 – 16.00 EA Aud and NL
	<b>Parallel Session 4**</b>	16.30 – 18.00 EA Aud and NL
<b>Thurs 5<sup>th</sup></b>	<b>Opening session and the NSW Trade &amp; Investment Keynote 3</b> – Judy Kay Followed by morning tea from 10.00-10.15	8:30 - 10:00 EA Aud
	<b>Parallel Session 5**</b> Followed by lunch break (not catered) from 11.45-12.45	10:15 - 11:45 EA Aud and NL
	<b>Closed meetings – Ed Psych Board, ISLS Memb, ISLS Edu</b>	11.45 – 12.45 EA116/EA115
	<b>Parallel Session 6**</b>	12.45 - 14.15 EA Aud and NL
	<b>Parallel Session 7**</b> Followed by afternoon tea from 16.00 - 16.20	14.30 – 16.00 EA Aud and NL
	<b>Parallel Session 8</b> – the Presidential session	16.20 - 17.50 EA Aud
	<b>Optional – ICLS Social Night and Harbour Cruise</b> All-inclusive dinner departs Darling Harbour at 19.10	19.00 - 22.30 Offsite – King St Wharf 2
<b>Fri 6<sup>th</sup></b>	<b>Opening session and Keynote 4</b> – Pierre Dillenbourg Followed by morning tea from 10.00-10.15	8:30 - 10:00 EA Aud
	<b>Parallel Session 9**</b>	10:15 - 11:45 EA Aud and NL
	<b>Closing Ceremony and conference end</b>	11.45 – 12.30 EA Aud

\* Registration and information are available in the New Law Lounge outside of these times.

\*\* Parallel sessions include symposia, long and short paper sessions and poster sessions; see the program for more details.

