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# INTEGRATIVE PERSPECTIVES ON COMPUTING EDUCATION RESEARCH: A PANEL BUILDING ON PACE WORKSHOP

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## INTEGRATIVE PERSPECTIVES ON COMPUTING EDUCATION RESEARCH: A PANEL BUILDING ON PACE WORKSHOP

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### Abstract:

This panel discussion will introduce Partnership for Advancement of Computing Education (PACE) to the audience and describe the goals and key outcomes of a recent NSF-funded PACE Workshop on Computing Education Research. Most importantly, the panel will give the participants an opportunity to join a multidisciplinary, multi-conference process of 1) articulating the vision for and the value of computing education research and 2) identifying the grand challenges of computing education. These processes will, in turn, produce outcomes that are expected to be highly valuable for advancing the agenda and strengthening the role of education research in computing and its subdisciplines.

**Keywords:** computing education research, IS education research, grand challenges

## I. INTRODUCTION

Partnership for Advancement of Computing Education (PACE) was established in 2011 with the goal of providing a unified voice and a communication and coordination structure for the community of teachers, scholars, and practitioners who work to educate a well-prepared and well-informed computing and information workforce. Its charter members included ACM, AIS, CRA, CSTA, IEEE-CS, and NCWIT. In August 2014, PACE organized its first major national event, an NSF-funded Workshop on Computing Education Research, which brought together leading education scholars in the core computing disciplines (CE, CS, IS, IT, and SE) and a number of related fields of study. The purpose of this panel is to report back to the IS education community on the goals and outcomes of the workshop and discuss major follow-up initiatives: the articulation of the vision for and value of computing education and the identification of a consensus view of grand challenges of computing education.

## II. DESCRIPTION OF THE TOPIC

The panel will include four separate but interconnected elements. Its first goal is to introduce PACE and its general purpose and goals to the Information Systems education community. Even though PACE was formally established already in 2011, it is not well known among the academics and practitioners in the field of computing education. Therefore, the panel will set the stage by briefly describing the process that led to the creation of PACE and discussing the vision, mission,

and the key strategies of the organization, particularly from the perspective of the benefits it has the potential to bring to the Information Systems community.

The second element of the panel will be a description of the goals of the Workshop on Computing Education research. They were as follows:

- Developing an improved understanding of the differences and similarities between the agendas of the various computing subdisciplines. Achieving a joint agenda for computing education research is very difficult if the subdisciplines do not understand the work that currently takes place in each of the communities.
- Moving towards a forward looking and comprehensive joint research agenda for computing education as a whole and not only as a collection of separate subdisciplines. One of the premises of the workshop was the belief that an integrated approach to computing education research can extend and enhance the reach and contributions of all the subcommunities, too.
- Determining ways in which academic and professional societies with a stake in computing education will be able to best serve the computing education research community.
- Through the prior three mechanisms, enhancing the standing of computing education research and galvanizing it into meaningful and effective action.

The third element of the panel will be a report of the key outcomes of the workshop. At the time of writing this proposal, the process of articulating and refining the outcomes is still ongoing, but a few of the key outcome elements are as follows:

- Computing education research needs to articulate better its vision and value. The quality of computing education is instrumental in determining the quality of the work that takes place in computing, which, in turn, is the most important transformational power currently affecting business, government, education, medicine, and any other field of human endeavor.
- The subcommunities of computing education research need better mechanisms for communicating with each other, and there is clearly a need for a venue that regularly brings together the entire computing education research community.
- There are many research areas that computing education subcommunities share with each other, and overlapping work of which the parties are not aware is taking place. At the same time, it is essential that seemingly small but important substantive differences between the communities continue to be respected.
- The subcommunities have the potential for sharing resources and building joint relationships with other communities (such as that with learning sciences).
- Academic and professional societies can serve a highly valuable purpose in building structures for broader recognition of high-quality work in computing education, strengthening the legitimacy of computing education research, and enabling collaboration and coordination across disciplinary boundaries.

Finally, the panel will give the AIS SIG-ED IAIM participants an opportunity to participate in two processes that were identified in the workshop as important ways to strengthen the profile and advance the agenda for computing education research: articulating its vision and value for not only computing disciplines but for various external stakeholder groups, too, and identifying the current grand challenges of computing education, which, in turn, would form a basis for providing guidance regarding the future focus areas of computing education research.

### III. STRUCTURE OF THE SESSION

The proposed panel will first include three presentations covering the first elements described above: Introduction to PACE (Lecia Barker), goals of the Workshop on Computing Education Research (Heikki Topi), and outcomes of the workshop (Jason Thatcher). Each presentation is followed by an opportunity for Q&A and discussion. Following the presentations and associated discussion, the panel will use a significant amount of time to solicit for the participants' views regarding the two ongoing large-scale processes: 1) articulating the vision and value of computing education research (James Parrish) and 2) identifying the grand challenges of computing education (Matt Nelson). Both of these will start with brief introductions that will lead to a discussion that is guided by prepared questions but later allowed to follow the direction in which the participants will take it. These processes are part of an interdisciplinary multi-conference conversation on the future of computing education research.

### IV. PANEL PARTICIPANTS

**Heikki Topi** (Moderator) is Professor of Computer Information Systems at Bentley University. His teaching interests cover a range of topics including advanced systems analysis and design, systems modeling, and data management. His current research focuses on human factors and usability issues in enterprise systems, information search and data management and the effects of time availability on human-computer interaction. His research has been published in journals such as *European Journal of Information Systems*, *JASIST*, *Information Processing & Management*, *International Journal of Human-Computer Studies*, *Journal of Database Management*, *Small Group Research*, *Communications of the AIS*, and others. He is co-author of two database management textbooks, *Modern Database Management* and *Essentials of Database Management*, with Jeff Hoffer and V. Ramesh and co-editor of *Computing Handbook, Vol 2: Information Systems and Information Technology*. He has been actively involved in national computing curriculum development and evaluation efforts (including IS 2002, CC2005 Overview Report, and as co-chair of the IS 2010 and the ongoing MSIS curriculum revision projects). He is a member of the ACM Education Board, the Board of CSAB, and TUN Executive Board, and he serves currently as Executive Director of PACE.

**Lecia Barker** is an Associate Professor in the School of Information at the University of Texas at Austin and a Senior Research Scientist for the National Center for Women & Information Technology. Lecia conducts research and evaluation in two areas: 1) Attracting, retaining, and advancing groups underrepresented in professional computing and science careers; these studies focus on social climate, identity/belonging, faculty adoption of teaching and curricular practices, and sustainable organizational change; and 2) Uses of IT in education; these studies focus on how situational factors influence use and usefulness of the technologies. Prior to joining University of Texas in 2008, Lecia was the founding director of the ATLAS Assessment & Research Center at the University of Colorado. She is Chair of the Board of the Partnership for Advancing Computing Education and advises several research and implementation projects intended to advance knowledge about computer science education. She is a co-PI of the NCWIT Extension Services program, which provides customized consulting to support systemic reform of computing and engineering departments. Her current research project is a mixed methods study of faculty adoption of teaching methods in computer science. Lecia holds a Ph.D. in Communication from the University of Colorado at Boulder, a Master of Business Administration from San Diego State University, and a Bachelor of Arts (Linguistics, Spanish, Portuguese) from the University of Iowa. Her dissertation research was an ethnographic study of LambdaMOO, one of the first online communities.

**Matthew L. Nelson**, CPA, Ph.D. is an Associate Professor in the Department of Accounting and Business Information Systems (BIS) at Illinois State University and an Adjunct Assoc. Professor in the College of Business at the University of Illinois at Urbana-Champaign. He currently serves as the Treasurer and Finance Committee Chair for the Association for Information Systems (AIS). He received his Ph.D. from the University of Illinois at Urbana-Champaign in Management Information Systems in 2003. His research interests include information technology valuation,

open source software, and information technology standards. He has published in the *Journal of Management Information Systems*, *Decision Support Systems*, *Information and Management*, *Journal of Information Systems Education*, *Communications of the AIS*, *Electronic Markets*, and *Mathematical and Computer Modeling*. Prior to joining Academics, Matt spent ten years in the Information Technology Industry in Senior Analyst and Management Consulting roles. From an education research and teaching perspective, Matt teaches Electronic Business, Introduction to Business Analytics, Information Technology Auditing, IT Project Management and MIS / IT Strategy. Matt is a Faculty Advisor to the AIS Student Chapter club and has researched the effect on student outcomes through variations in teaching technologies.

**James Parrish** is an Associate Professor of Information Systems at Nova Southeastern University's Graduate School of Computer and Information Sciences (NSU – GSCIS). He also holds the positions of Vice President of Student Chapters of the Association of Information Systems (AIS) and the Vice President of the South Florida Technology Alliance (SFTA), a group dedicated to advancing the technology ecosystem in the South Florida Area. In 2008, he received his PhD from the University of Central Florida in Business Administration (MIS). His research interests include the impacts of social networking sites on knowledge management, topics related to IS education, and the personal and organizational impacts of wearable technologies. He has published in multiple journals including *Communications of the ACM*, *Communications of the AIS* and *Journal of Information Systems Education*. At NSU-GSCIS, Dr. Parrish currently teaches classes on IS strategy, cloud computing, and systems analysis and design. Prior to joining NSU-GSCIS, he held the position of Assistant Professor of MIS at the University of Arkansas at Little Rock and spent more than 10 years in the private and public sectors of the IT industry as a systems analyst and IT manager.

**Jason Thatcher** is a Professor in the Department of Management at Clemson University. He holds B.A.'s in History (Cum Laude) and Political Science (Cum Laude) from the University of Utah as well as a M.P.A. from the Askew School of Public Administration and Policy and a Ph.D. in Business Administration from the College of Business at Florida State University. Dr. Thatcher directs the Social Analytics Institute (SAI), an interdisciplinary, university-level project that brings together faculty, staff, and external partners to support student learning, faculty research, and outreach through social media. The SAI focuses on aggregating, visualizing, and extracting meaning from very large datasets gathered from the social web. The SAI is designed to connect industry and academe through interdisciplinary research. Dr. Thatcher's research examines the influence of individual beliefs and characteristics on adaptive and maladaptive uses of information technology. He also studies strategic and human resource management issues related to the effective application of information technologies in organizations. His work has appeared in more than 100 journals, conference proceedings, and conference presentations including prestigious outlets such as *MIS Quarterly* and the *Journal of Applied Psychology*. Dr. Thatcher teaches courses in Management Information Systems (MIS) and Strategic Management. He was named to the Circle of Compadres by the KPMG foundation for contributions to mentoring minority Ph.D. students. Dr. Thatcher is serving his second term as Vice-President of Member Services for the Association for Information Systems.