Proposal for a Special Issue

*Conceptualizing and Using Theory in Computing Education Research*

ACM Transactions of Computing Education

# Overview and motivation

In recent years, there has been considerable interest in the use of theory in computing education research (CER). Several literature surveys have been published in the proceedings of International Conference of Computing Education research (ICER), as well as in ITiCSE working group reports, which address questions, such as: How widely research papers in CER build on theoretical frameworks from other disciplines? Which theories are most widely used? What kind of theoretical development has emerged within the field itself? Which variables and measurements have been used in computing education?

This general interest relates to the fact that several key publication venues (ACM TOCE, Computer Science Education, ICER and Koli Calling) clearly guide authors to apply relevant theories. For example, TOCE instructions for authors state: “Paper authors are strongly encouraged to frame their research in terms of one or more learning theories.” On the other hand, there has also been debate on the role of theories in our field. Our experience as ICER conference chairs has revealed that the role of theory is frequently a challenge for reviewers, because in CER there is not a normative way of carrying out and reporting research.

We propose that ACM Transactions of Computing Education publish a special issue which would solicit papers related to the conceptualization and use of theories in computing education research. Below we suggest a tentative list of topics and points of view for this issue, but we do not limit them to only these aspects.

* Reviewing the use of theory in computing education research
* Theories for explanatory research in computing education
* Theory-based predicting results in computing education
* Combining theories to enrich our understanding of learning computing
* Using or developing domain specific theories for computing education
* Adapting theories from social sciences for computing education
* Analysing and discussing how theories can support computing education research
* Novel theoretical perspectives on/for computing education

# Issue Contents

* Joint introductory editorial giving the motivation and overview for the special issue.
* Set of accepted papers (6-8 papers anticipated).
* Dialog between a subset of authors on a small set of controversial issues raised in and by the papers. (Similar in nature to “Chapter 2: Computing Education Research Today” from *Cambridge Handbook of Computing Education* and “Alice, Greenfoot, and Scratch: A Discussion” from *ACM-TOCE* 10:4, 2010)
* [optionally] annotated list of important theories from related disciplines
* [optionally] annotated list of model papers in CSE or related fields
* [optionally] annotated list of review papers related to this topic

# Solicitation and review process

To advertise the special issue, in addition to posting the CfP on the journal’s website, we will also disseminate it via the [csed-research@uw.edu](mailto:csed-research@uw.edu) email list, the ACM/SIGCSE email list, and within our professional networks. In addition we will invite thought leaders in CSE to submit an extended abstract who have written about this topic previously.

We propose the following review process.

1. Authors submit an extended abstract of their paper.
2. Guest editors review abstract and invite or reject for submitting full paper, possibly merging some of the proposed papers together.
3. Authors submit full paper.
4. Full papers receive 3 reviews each, with each paper receiving at least one review from another author to the special issue and one review by an expert in CSE who is not submitting to the special issue. Guest editors are responsible for finding and assigning papers to qualified reviewers.
5. Guest editors make decision recommendations to the journal editors; only papers that require revisions achievable within a short time frame, (see schedule below) will be accepted.
6. Authors submit final versions of paper; minor revisions checked by guest editors.

# Timeline

Start advertising: Oct 31, 2020

Abstracts due: Jan 15, 2021

Decisions made on abstracts: Feb 15, 2021

Reviewers lined up: Apr 15, 2021

Full papers due: Jun 15, 2021

Paper reviews due: Aug 15, 2021

Decisions on papers: Sep 15, 2021

Revised papers due: Dec 15, 2021

Editorial draft to EiC’s Dec 15, 2021

Final paper decisions: Jan 15, 2021

Special issue completed: Feb 28, 2022

# Proposer qualifications

Lauri Malmi is a professor in the Department of Computer Science at Aalto University since 2001. He is leading the Learning+Technology research group (LeTech) whose main research area is computing education research. The foci of the group include development and evaluation of advanced learning environments and learning tools for programming education, especially tools for automatic assessment and feedback, program and algorithm simulation and visualization, and gamified approaches to learning programming. Malmi has been leading the national Center of Excellence in Education at Helsinki University of Technology in 2001-2006. He has chaired several international conferences in computing education research (Koli Calling 2004, 2008 and ICER 2017-2018). He has been a regular columnist in ACM Inroads, and served as editorial board member in ACM Transactions on Computing education in 2010-2015 and IEEE Transactions on Learning Technologies in 2013-2018. He received the ACM SIGCSE award for Outstanding Contribution to Computer Science Education in 2020.

Josh Tenenberg is a Professor in the School of Engineering & Technology at the University of Washington Tacoma. He has an undergraduate degree in Music, and a MS and PhD in Computer Science. He carried out advanced study at the Vincent and Elinor Ostrom Workshop on Political Theory and Policy Analysis at Indiana University. He has carried out research in Artificial Intelligence, Design, Computer Supported Cooperative Work, Technical Communication, Human-Computer Interaction, and Computing Education. He served as the Co-Editor-in-Chief of the *ACM Journal on Educational Resources in Computing* 2006-2008, as founding Co-Editor-in-Chief of the *ACM Transactions on Computing Education* 2009-2015 and as the Conference and Program Co-Chair of the ACM International Computing Education Research conference in 2016 and 2017. He served as guest editor for an issue of *Expert Systems*, and appointed and oversaw guest editing for over ten special issues for *ACM TOCE* during his tenure as Co-EiC.