Computer-Supported Collaborative Learning and Learning Sciences Research in EducMap

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Abstract: This study examined the positions of Learning Sciences (LS) and Computer-Supported Collaborative Learning (CSCL) research in educational research using EducMap, a map of global educational research. LS/CSCL research has a presence in about one third of educational research, a substantial presence given its relatively short history.

Introduction

Learning Sciences (LS) and Computer-Supported Collaborative Learning (CSCL) seek to advance sciences and practices of learning. They have a relatively short history compared to educational research at large, but have been actively expanding its impact and relevance. In this paper, we examined the place of LS and CSCL in educational research using EducMap, a map of bibliographical clusters in educational research.

Methods

EducMap was constructed using a bibliographic coupling technique analysis. Educational research papers were extracted from Scopus and were linked when they share at least two references. This resulted in a map of 19 research clusters that differ in their core references (Jeong, Lund, Grauwin, & Jensen, in preparation). LS and CSCL core papers were identified based on the papers listed in syllabi and webinar sections of the NAPLES site and recent reviews on CSCL. Removing overlapping papers, the LS core paper list contains 452 papers and the CSCL core paper list contains 251 papers in total (Jeong & Kim, 2018). We located clusters in which these LS and CSCL core papers appear in one of the key places of the cluster (e.g., the top 15 most cited references or in the top 10 more representative or most cited papers within the cluster). We identified these cluster as LS and/or CSCL clusters, but note that this does neither mean that the respective fields "own" the clusters nor the absence of another field. They are only one of the many key references associated with the clusters. EducMap is available for three time periods (i.e., '2000-2004', '2005-2009', '2010-2014') at the moment, but the current paper reports on the second period in which CSCL was being established as a field with the first publication of ijCSCL in 2006.

Results

Of the 19 clusters in EducMap, seven clusters were identified as LS, two of which were also identified as CSCL (Figure 1). LS/CSCL research has a presence in about one third of the clusters in this period, a substantial presence given its relatively short history. What are the clusters of research in which LS or CSCL core papers have a presence? The biggest LS cluster is the Learning Systems cluster. Papers in this cluster address a diverse set of issues from language learning, professional development, and/or identities, and yet are closely connected by a set of shared references. References about socio-cultural perspectives (e.g., Lave & Wenger, 1991) were visible, suggesting that sociocultural theory is serving as a theoretical background to papers in this cluster. The next biggest LS cluster is the Motivation cluster. It mainly consists of papers that addressed goal orientation, development of interests, among other things, and tend to ground their research on theories of social learning and motivation (e.g., Bandura, 1997; Dweck & Leggett, 1988). The School Building cluster, the next biggest LS cluster, tends to consist of papers about inquiry learning, scientific argumentation, and technology, among other things. Consensus documents such as National Science Education Standards were highly cited in this cluster. The rest of the LS clusters appear to be about medical education with an emphasis on problem-based learning (PBL) and teacher training.

Two clusters, Cognitive Systems and Internet, were also identified as CSCL clusters, that is, both LS and CSCL core papers appeared in these clusters. The Cognitive Systems cluster is interested in CSCW and learning systems with emphasis on animated models, computer-based instruction and expertise-reversal effects. References related to cognitive load theory and multimedia learning were highly cited in this cluster. As for the Internet cluster, research addresses topics related to computer-mediated communication, asynchronous online discussions, as well as content analysis methods. Papers related to communication theories (Short, Williams, & Christie, 1976) and content analysis were highly cited in this cluster, suggesting a close link between content analysis methods and online communication.
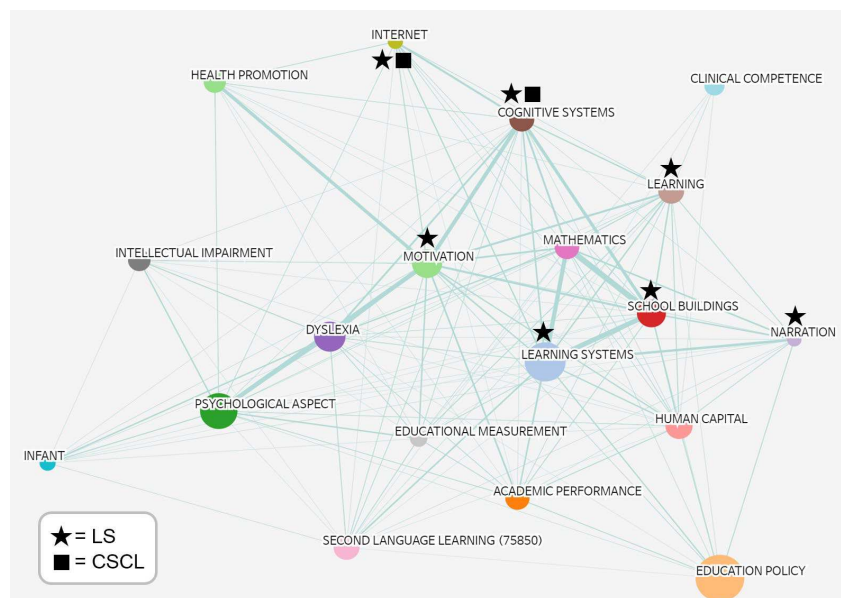
Figure 1. LS and CSCL clusters on EducMap during 2005-2009.

Discussions

The results showed that seven out of the 19 research clusters in educational research were classified as LS and/or CSCL clusters during 2005-2009. LS/CSCL research has a strong presence in clusters that emphasize sociocultural theory, science education, motivation, and teacher training. A strong presence in such clusters are aligned with the missions of the fields, and are encouraging. At the same time, LS/CSCL research was not clearly visible in other clusters. LS/CSCL research does not need to have strong presence in all educational research, but a lack of presence in clusters that emphasize educational policy, and disciplinary learning other than science education is somewhat unexpected because these are issues that LS/CSCL consider important. The LS/CSCL research community needs to make more concerted efforts to reach out and make connections in these research areas. This study is the first application of biographical coupling to LS/CSCL research. Cautions are needed in interpreting the results, but the results provided insights about the positions of LS and CSCL research in educational research as a whole. We hope this study sparks lively reflections and discussions about where future research efforts need to be directed to fulfill the missions of learning sciences and computer-supported collaborative learning.

References

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