Comparison between International and Korean CSCL Research

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Abstract: This study explores the relationship between international and regional CSCL research by comparing CSCL research published in international journals and CSCL research published in Korean journals. Bibliographic Coupling (BC) analysis was used to map the two corpora of CSCL research. Preliminary results suggest that the Korean CSCL research shares research interests with the international CSCL research, and yet have different foci.

Keywords: CSCL, Bibliographic Coupling Analysis

1. Introduction

Academic research is a global enterprise, being carried out by researchers distributed around the world. They share research interests and missions so that, for example, the goal of CSCL research is to support collaborative learning with computers. Research outcomes, although produced in distributed manners, are shared through publications. The development of communication and transportation technologies along with the adoption of English as an international language of science have led to the emergence of "international" research communities. And yet there are costs that come with the internalization of research, such as the loss of linguistic and rhetorical diversity and the marginalization of works published in non-English journals (Tardy, 2004). In this study, we explore whether and how a regional CSCL research, in this case Korean CSCL research published in Korean journals, may differ from the international CSCL research published in international journals. The current study is built on our prior work in which we applied the Bibliographic Coupling (BC) analysis to an international CSCL corpus and identified major and minor CSCL research clusters (Jeong, Seo, Jeong, Hmelo-Silver, Grauwin, 2019). In the current study, we created a BC map of Korean CSCL research and compared the two maps to understand the extent to which a regional (i.e., Korean) CSCL research is aligned with and/or diverge from the global CSCL research.

2. Methods

The international CSCL research corpus was constructed in prior research and consists of 869 papers published in international journals (Jeong et al. 2019). The Korean CSCL corpus consists of 195 papers published in Korean journals. In both corpora, paper selection was based on searches in the major CSCL journals and major databases (e.g., Web of Science and ERIC for the international corpus and KCI for the Korean corpus). While the two corpora were constructed in a similar manner, they differ in their scopes. The international corpus covers research from 2005-2014, whereas the Korean corpus contains research from 2005-2016 due to the fact that it was constructed later. The two corpora also differ in their coverage of the learning domains. All learning domains are included up to 2009 in both corpora, but some of the non-STEM domains (e.g., humanities) are excluded from the international corpus after 2010 due to the change in funding agency, which made the international corpus biased toward STEM domains. These differences in the two corpora are taken into accounts in interpreting the outcomes.

In BC analysis, papers were linked together if they share references (Kessler, 1963). The more references they share, the stronger the link becomes. A community detection algorithm (an implementation of the Louvain algorithm) is then applied to the network of these papers. The algorithm partitions the publications into major clusters of research that are linked closely to each other.

3. Findings

3.1 Descriptive Comparisons between the International and the Korean Corpus

We first compared descriptive features of the two corpora (see Table 1). First, the two differ in their sizes. The size of the Korean corpus is quite large (about 22% of the international corpus) even after we consider the fact that it covers a longer period of research. The relatively large size of Korean CSCL corpus shows that CSCL is an active area of research in Korea, though it was not one of the key contributors to the international corpus (Jeong et al., 2019). Second, the two corpora differ in their coverage of the learning domains. The proportion of STEM studies is higher in Korean corpus (65% vs. 58%), in spite of the fact that the international corpus is biased toward STEM domains. It appears that there is a stronger emphasis on STEM in Korean CSCL research compared to international CSCL research.

"Collaborative learning" was the mostly frequently used author-assigned keyword in both corpora, but it appears that the international CSCL research emphasizes computer-mediated communication, interactive learning environments, and teaching/learning strategies, whereas the Korean CSCL research emphasizes interaction, academic achievement, wiki, and blended learning. There is more emphasis on achievement in Korean CSCL research. The Korean CSCL may also have a narrower research focus compared to international CSCL research, examining a specific type of interactive learning environment (i.e., Wiki) and/or teaching/learning strategies (i.e., blended learning), a natural outcome considering its smaller size.

Table 1

Descriptive Characteristics of the International and the Korean CSCL Corpus

	International Corpus (N=869)	Korean Corpus (N=195)
Learning domain	STEM (58%) > non-STEM (42%)	STEM (65%) > non-STEM (35%)
Most frequent author's keywords	1. Collaborative Learning (11.4%) 2. Computer-Mediated Communication (11.3%) 3. Collaborative Learning/Cooperative Learning (10.6%) 4. Interactive Learning Environment (10.4%) 5. Teaching/Learning Strategies (8.6%)	1. Collaborative Learning (7.7%) 2. Interaction (6.7%) 3. WIKI (5.6%) 4. Academic Achievement (4.6%) 5. Blended Learning (4.6%)
Most cited references	1. Vygotsky. (1978). Mind in society: Development of higher psychological processes (14.3%) 2. Dillenbourg. (1999). Collaborative learning: Cognitive and computational approaches. advances in learning and instruction series (7%) 3. Kirshner et al. (2002). Three worlds of CSCL: Can we support CSCL? (5.6%)	1. Henri. (1992). Computer conferencing and content analysis (8.2%) 2. Vygotsky. (1978). Mind in society: Development of higher psychological processes (7.7%) 3. Harasim. (1990). Online education: perspectives on a new environment (5.1%)

Similar patterns emerged when most cited references were compared. Vygotsky (1978) was highly cited in both corpora, although the extent varied between the two corpora (14.3% vs. 7.7%). Vygotsky (1978) is a critical publication of sociocultural theory that provided a framework to understand social influence and tool mediation. High citation of his work indicates that CSCL research is strongly guided by sociocultural framework, although its influence is little less in Korean CSCL research. In the international corpus, Dillenbourg (1999) and Kirshner et al. (2002) rank second and third. They also rank 7th (3.6%) and 11th (3.1%) in the Korean corpus, indicating somewhat diminished but still strong influences in Korean CSCL research. On the other hand, Henri (1992) and Harasim (1990) rank first and third in the Korean corpus, but 85th (1.6%) and 1,436th (.6%) in the international corpus. Their uneven influences in the two corpora suggest that Korean CSCL research may draw on knowledge bases different from the mainstream of international CSCL research, likely due to the fact that it focuses on sub-areas of international CSCL research.

3.2 BC Map Comparisons between the International and the Korean Corpus

Korean CSCL map consists of seven clusters, whereas the international BC map consists of ten clusters (see Figure 1). Given the size difference, it is not surprising that there are more clusters covering a wider array of research topics in the international BC map (note that the cluster labels in Figure 1 are based on most frequent and yet distinct keyword of the clusters). The two maps also differ in its structure, so that the international CSCL BC map has a clear center, the argumentation cluster, which is well-connected to the rest of the clusters. The clusters in the Korean CSCL map were also well-connected, but it did not appear to have a central cluster.

As can be seen from Figure 1, argumentation cluster appears in both maps, but appears to be differentially emphasized. The argumentation cluster is the second biggest cluster (n=127; 15%) along with the learning environment cluster and positioned at the center in the international map, whereas it ranks fourth (n=18; 9%) and positioned at the periphery in the Korean map. Argumentation appears to be a more prominent research topic in the international CSCL research. The examination of the both argumentation cluster also suggests that the two may approach CSCL from a different perspective. For example, cognitive load theory (Sweller et al., 1998) strongly guides research in the Korean argumentation cluster, but not in the international argumentation cluster.
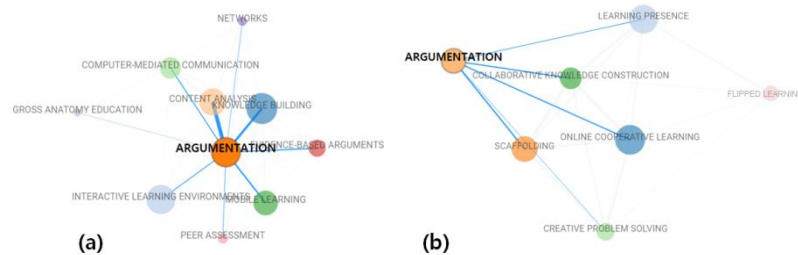

Figure 1. International (a) and Korean (b) BC map of CSCL research.

4. Summary and Discussions

In this study, we examined the relationship between the international and Korean CSCL research using a BC analysis. By definition, Korean CSCL research constitutes the international CSCL research. As such, it is aligned with the international CSCL research with shared research interests and common references, but there also exist important differences in what is being researched and emphasized. These are likely to reflect the local values and emphasis in research and education. Research communities around the world are increasingly connected to each other, forming a large body of "international" research. This can help researchers to share their research findings and benefit from each other. And yet, language barriers prevent researchers from reaping these benefits. We should strive for lowering these and other barriers so that researchers around the world can benefit from each other's work more fully. At the same time, we should keep in mind that education is situated in local contexts. Internationalization of academic research should not mean abandoning local values and needs but should lead to an enrichment of our understanding about how to support learners to communicate and collaborate effectively around the world.

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