Lexical Network Analysis on Synchronous Discussion

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ABSTRACT

This study investigates how collaborative concept mapping tasks affect the knowledge convergence of learners. Participants are divided into two groups by different group contingency, independent and interdependent and discourses were analyzed. We detected delineated clusters and compared the degree and density. Though each cluster includes identical terms, slightly different terms in clusters were found by the groups —also, the average degree and average weighted degree of the interdependent group was relatively higher than the independent group.

BACKGROUND

Collaborative learning

Dillenbourg(1999) defined *collaborative learning* as two or more people's attempts to learn something together compared to cooperation. These collaborative tasks contribute to the knowledge convergence of members with the assumptions that collaborative learning can engender similar post collaborative knowledge structure. That is, knowledge is exchanged and converges through interaction (Roschelle 1995).

Concept mapping

It is a visualizing technique to organize and represent the relationships among nodes(concepts) by edges (connecting nodes) as a part of qualitative methods (Novak & Gowin 1984; Novak & Canas, 2008). As a cognitively demanding task given the complex procedures such as identifying the main concepts and finding relationships among nodes by focusing on the organizational structure of the text simultaneously screening the learning materials (Jonassen 1997; Hay et al.,2008), collaborative concept mapping tasks are one of the important strategies to integrate individual learning with various group learning skills in knowledge construction (Van Boxtel et al., 2002).

DATA

Participants

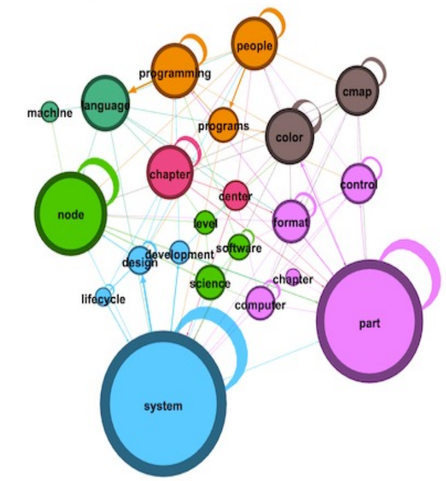
We randomly selected one independent and one interdependent group from one study to compare and analyze their discourses to understand how th collaborative concept maps are constructed differently by the group contingency, independenc and interdependence.

RESULTS

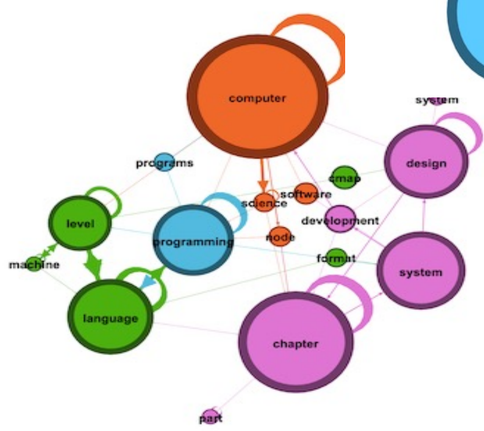
Based on the content-related term frequency in two transcripts, we created their lexical networks in different group contingency and compared them to understand the difference by the group. We picked 40 relevant terms from the most frequently used terms, and networks joined in pairs by edges were generated. Using Modularity, based on the eigenvectors of a characteristic matrix for the network (Newman 2006), we detected delineated clusters and compared the degree and density.

	Independent	Interdependent
Average degree	3	5.182
Avg.Weighted Degree	6.647	9.091
Network Diameter	5	4
Graph Density	0.188	0.247
Modularity	0.303	0.204

Interdependent



Independent



Independent- four different term clusters with 17 nodes and 51 edges in group 1

Interdependent- seven clusters with 22 nodes and 114 edges in group 2

There are more nodes so as more clusters and the terms in each cluster were different in groups. Though each cluster includes identical terms, slightly different terms in clusters were found by the groups.

FUTURE RESEARCH

For the future research, we will add more cases to see the term networks and find commonalities with the attributes of knowledge convergence and design the intervention accordingly.