Epistemic Frames of Idea Evaluation in Collaboration

Shono Ikeda, Jun Oshima and Ritsuko Oshima
ikeda.shono.17@shizuoka.ac.jp, joshima@inf.shizuoka.ac.jp, roshima@inf.shizuoka.ac.jp
Shizuoka University

Abstract: Idea promisingness is a key to the creative work. Although studies have shown its importance, they have not yet dug into multiple meanings of promisingness. In this study, we approached the problem by examining the criteria of idea evaluation. Epistemic network analysis by successful and unsuccessful groups revealed that students in the successful groups held their epistemic frames of idea evaluation by taking the balance between being challenging and pragmatic.

Background and research purpose

In the knowledge age, workers are expected to engage in continuously creating new ideas through collaboration with others. Such competence is not innate but should be developed in the context of learning. Chen, Scardamalia, and Bereiter (2015) examined the extent to which elementary school students could appropriately judge promisingness of their ideas to facilitate knowledge-building. Their analyses indicated that their students held their primitive sense of promisingness and could develop their competence to judge promisingness of their ideas through well-designed exercise. Chen (2017) further explored the relationship among students' competence to judge their idea promisingness, conceptual understanding of their study topic, and their epistemic beliefs. Through his design-based research in a sixth-grade classroom, Chen found that students succeeded in improving their understanding and judging promisingness through their repeated practices. Along with the development of their competence to judge promisingness, conceptual understanding and epistemic beliefs also improved throughout practice. Although the promisingness of ideas has been found a key to the collective knowledge advancement, studies so far have not dug into the criteria of idea evaluation. When students evaluate their ideas, the promisingness may have multiple meanings. Blair and Mumford (2007), for instance, asked undergraduates to evaluate ideas, and found that students highly evaluated ideas based on the criteria such as (1) whether the ideas are easy to understand, (2) whether they provide short-term benefits to many, and (3) whether they are consistent with prevailing social norms. Their undergraduate students disregard risky, time consuming, and original ideas. Original and risky ideas, however, were conditionally preferred. When evaluation criteria were not especially stringent and time pressure was high, the undergraduates selected the risky and original ideas. What studies like Blair and Mumford suggest is that people use multiple criteria to evaluate their ideas depending on conditions. In future studies, therefore, we have to examine what criteria of idea evaluation including the promisingness are used by learners in learning environments and their individual or group differences for considering further support for learners to engage in the knowledge creation practices.

The purpose of this study was to propose a new framework of analysis of learners' idea evaluation and examine group differences in their epistemic frames of idea evaluation during project-based learning. For doing so, we used Epistemic Network Analysis (ENA) as a tool for describing epistemic frames held by successful and unsuccessful groups. ENA is an algorithm that identifies and calculates connections among elements in coded data and visualizes them in dynamic network models that illustrate their structure and strength over time (Shaffer, 2017). With ENA, researchers can qualitatively and quantitatively examine cultural practices that participants engage through their discourse.

Method

Subject groups

We selected four groups (two successful groups and two unsuccessful groups) in a project-based learning course on creating new happiness indicators for first-year university students. Seventy students took the course for their requirement and worked in groups on their proposal of new happiness indicators with the use of open source data available on the internet. Based on their final grades, two successful and two unsuccessful groups were selected for our analysis of their epistemic frames of idea evaluation. The two successful groups were comprised of four students each, and the unsuccessful groups were comprised of three and four students.

Collected data and coding

The course continued in fifteen weeks. Students' discussion in their groups was audio-recorded and the recordings in week 9–11 for the target groups were used for the analysis. We selected the recordings in the weeks as they were a period when students were mainly engaged in generating their new ideas. Every discourse exchange was coded on ELAN (https://tla.mpi.nl/tools/tla-tools/elan/) with using twelve attributes of idea evaluation by Blair and Mumford (2007).

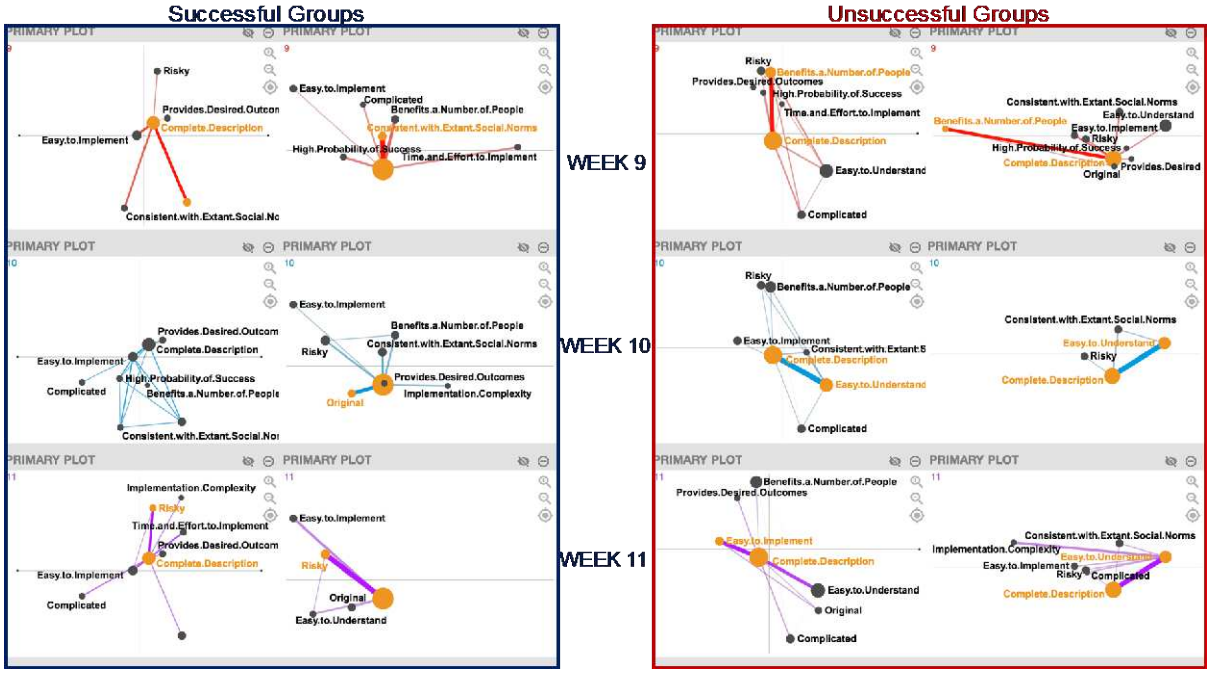

Figure 1. Temporal changes in epistemic frames of idea evaluation by successful and unsuccessful groups.

Results and discussion

Based on the co-occurrence of attributes within units of discourse exchanges, the target groups' epistemic frames of their idea evaluation were visualized across the three weeks (Figure 1). Comparison between the successful and unsuccessful groups revealed commonalities and differences. First, both types of groups mainly discussed their ideas from the perspective of complete description (i.e., how their ideas about new happiness indicators should be described). They paid much attention to which evidence and data should be used for claiming the effectiveness and importance of their ideas. Second, although both types of groups shared the primary component in their epistemic frames, they were critically different in that different attributes were strongly connected with the complete description. In the successful groups, they were more likely to consider aspects of the risk and originality of their own ideas in later weeks in comparison with the unsuccessful groups that stayed at easiness to understand and implement. Thus, the successful groups engaged in an examination of the risks and originality of their ideas at some points of their generating ideas. How promising their ideas were crucial for both groups, but their meanings of the promisingness was not the same. For successful groups, the promisingness meant challenging enough as well as reasonable to understand and implement. The balance between the two dimensions of idea evaluation might be the key for us to support every group of students to be engaged in their creative work with ideas.

References

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