Supporting Interaction Analysis for Collaborative Learning

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Many of software designers of CSCL environment have been suffering from complex and subtle educational requirements offered by clients. One of major causes of the problem they face is the lack of shared understanding of collaborative learning. We do not know what design rationale of CSCL environment is and even do not have common vocabulary to describe what the collaborative learning is. In this research, we are aiming at supporting such complex instructional design (ID) process of CSCL environment. To fulfill the aim we have been constructing an ontology to represent CSCL session[1,2]. The ontology will work as both vocabulary to describe the session and design patterns referred to during the instructional design process. To represent learning scenarios using the ontology will facilitate users' shared understandings and reuse the scenarios. It is useful to store and provide effective learning scenarios as design patterns. As the first step to fulfill our aim, we adopt learning theories as foundation to analyze, design, and develop the learning sessions. The design patterns inspired by the theories provide design rationale for CSCL design.

Currently, laying the ontology and CSCL models formulated in terms of the ontology as basis, we have been conducting a project aiming at developing various kinds of ID support systems for CSCL. In this poster, we introduce the *'Theory-based Interaction Analysis (TIA)' support system*. We can observe various kinds of interaction among members of a learning group during collaborative learning session. The key to understanding CSCL lies in understanding the rich interaction between individuals. However, it is difficult for even human users to analyze them in order to clarify what types of collaboration have occurred in the session and what educational benefits have been expected for the members through the session. So, we propose an *interaction analysis support system* that helps users to abstract essence of interaction from raw protocol data, and to understand what types of collaboration have been occurred in the session, and then infers educational benefits expected to be gained by the members through the interaction process. We describe what interaction analysis is and why the interaction analysis is difficult for educational practitioners and CSCL designers, and propose an interaction analysis support system to reduce the difficulties, and interaction patterns that are core part of the system. The interaction patterns represent typical interaction processes, which are abstracted, desired interaction process inspired by learning theories. The system compares learners' interaction process with the typical interaction patterns to infer whether the process is effective for the learners or not.

At this stage, we rely on learning theories to construct interaction patterns and pick up utterance-labels for abstracting raw protocol data. For future work, we will extend the system to embed a module that users can store new interaction patterns to the system. By this extension, the user uses their best practice as typical collaborative learning patterns. Moreover, we will construct a collaborative learning support system in which learners select utterance-labels or use sentence-openers, and the system identifies the state of collaborative learning and advises the learners on their learning process.

References

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