A Step Towards Integration of Learning Theories To Form an Effective Collaborative Learning Group

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We are aiming at building a sophisticated ontology through a survey of existing learning theories. On top of that, our research objectives include constructing a collaborative learning (CL) support system that detects appropriate situation for a learner to join in a CL session, and forms a CL group appropriate for the situation dynamically. To fulfill these objectives, we have to consider the following:

1. How to detect the appropriate situation to start a CL session and to set up the learning goal,
2. How to form an effective group which ensures educational benefits to the members of the group, and
3. How to facilitate desired interaction among learners in the learning group.

We have discussed item 1 in our previous papers, and now focus on item 2.

There are many learning theories to support the advantage of CL. A designer should construct CL-support systems taking the theories into consideration and represent what he/she intended as an explicit model of design with justification by the theories. The system designed, on the other hand, needs to understand the model and yields reasonable supporting behavior for CL based on the understanding. The understanding of learning theories used for justification is, needless to say, partial as compared with what the human expert of learning theories knows. However, we believe the learning theories, even partial, should be modeled as a basis of system design. The problem the system designer faces is caused by difficulty in understanding the learning theories due to the lack of common and solid background concepts for CL. An ontology represents common concepts of the learning theories as a solid system of concepts. It establishes the shared understanding among designers and systems about the model of CL which is justified with the learning theories.

We have been constructing a system of concepts, we call "Collaborative Learning Ontology", to represent CL sessions supported by these learning theories. Now, we focus on "Learning Goal Ontology" which is a part of the Collaborative Learning Otology. The ontology will ease the difficulty for the system designers in understanding the learning theories. Based on the ontology, we are probing into a possibility that theory-based learning groups can be combined into one in order to help a learner attain his/her learning goals.

Further information on our ontology is available at:
`http://www.ai.sanken.osaka-u.ac.jp/~inaba/LGOntology/`