

OASIS: Designing CSCL to Support Argumentation

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Abstract: Computer-supported collaborative learning (CSCL) environments can support inquiry learning by providing argumentation tools. This paper introduces OASIS (Online Annotation and Argumentation Support for Inquiry System) developed to support both cognitive and social processes of argumentation with its visual representation, communication, and management tools.

Introduction

Computer tools can scaffold social and cognitive processes of argumentation by providing opportunities for elaborating, explaining and sharing; by supporting constructing and co-constructing; and by helping students keep track and reflect on their ideas (Andriessen, 2006). This paper introduces an ongoing research project that has developed OASIS (Online Annotation and Argumentation Support for Inquiry System), a theory-driven and pedagogically-guided web-based learning tool, to support communication, argument representation, and argumentation management. OASIS consists of two major parts: 1) a browser-based application on Firefox that enables users to create online annotation for the purpose of collaborative learning (Figure 1) and 2) a website where users can access, organize, manage, and reflect on their learning activities (Figure 2).

Argumentation Representation and Communication

Developing argumentation skills require basic skills such as reading and writing. Highlighting facilitate learners reading argumentatively by visualizing and attending to arguments. In the course of reading, highlighting can draw attention to important points, provide a set of markings for later reference, and help extract structure from the text when re-reading the article (O'Hara & Sellen, 1997). In OASIS, the highlighter tool is designed with different colors, which can assist students construct and compare different perspectives in argumentation.

When doing highlighting, students are prompted to choose from a list of tags that can be either provided by teachers (Task tags) or defined by themselves (My tags). *Tags* can be an external representation of how learners make sense out of the reading and how they organize the knowledge (Hong, Chi, Budiu, Pirolli, & Nelson, 2008). As such, highlighting does not just involve marking the important points, but also a purposeful tagging process that can promote and assist students identify and analyze positions, recognize multiple perspectives and supporting evidence, and construct their own argument. The sticky notes feature can further assist critical reading and *elaboration* on the part of learners. Similar to tagging, the sticky notes come hand-in-hand with highlights; yet it could be used in a more flexible way to assist understanding, analyzing, and thinking. The sticky notes feature provides an easy way to capture their thoughts, opinions, and questions and embed them in the context of source information.

OASIS is a social annotation tool in which way it enables annotating collaboratively on the same webpage, sharing the annotated pages among group members, and communicating via sticky notes. As shown in Figure 1, students can share their annotated work within a group and communicate with group members via sticky notes.

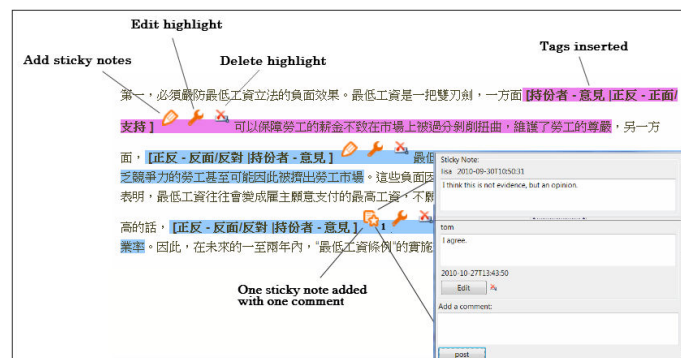


Figure 1. Screenshot of a Webpage Annotated by OASIS.

Management Features

OASIS also has a website (See Figure 2) that allows students to view, organize, manage, and synthesize their annotation. All annotation data are saved in a database and can be available through web server. My collection saves all the web pages and the annotations made on each one. In “My tags” section, students can create new tags, edit the tags created before, or delete them. Another useful feature is to view all the highlights added with a specific tag. In the area of “My groups”, a list of groups a student belongs to will be shown. “My report” enables users to view and export the annotations. He can also export the report as an Excel file and save it for further edit.

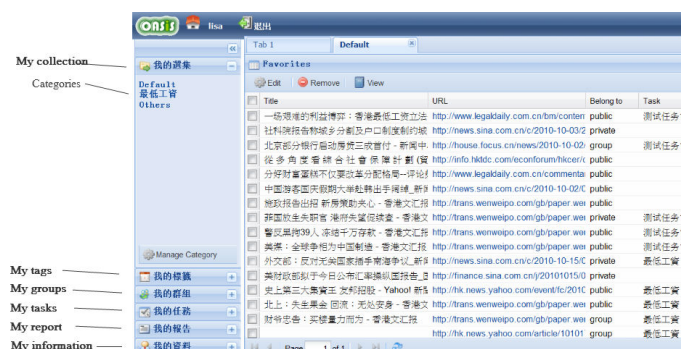


Figure 2. Screenshot of OASIS Website.

OASIS provides a set of tools for teachers to create, monitor, and manage learning tasks and group activities. Teachers can provide tags to scaffold student critical reading. They can create relevant tags based on the learning objectives, the content and nature of the source materials, and assign the tags to the task. Additionally, OASIS allows teachers to monitor students' learning progress. The system can generate statistical reports of students' performance including total number of highlights made, self-defined tags, and sticky notes created by each student in a specific task.

Implication of OASIS Research and Application

Driven by argumentation theories and pedagogical needs, OASIS is designed to support inquiry processes with its visual representation, communication, and management tools. Students can annotate, tag, and share their opinions while reading. They can also organize, reflect, and regulate their inquiry task on the website. OASIS also supports teacher monitor individual, group, and whole class work. It also affords teachers flexibility to create tags so as to support reading argumentatively according to the nature of the task and students' level of ability. More than just a learning tool, OASIS is a research tool through which researchers can study students' cognitive and social behaviors. For instance, it can be researched on if and how different types of annotation representation affect reading and writing arguments; how students argue collaboratively on OASIS with the support of sticky notes; how students manage, reflect, and regulate their inquiry project with the support of OASIS management tools.

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