ROG: A reflective logging tool for sharing interpretations of a study scene

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Abstract
In learning sciences, the observations and their interpretations of study scenes compose of essential data for research. Such data are particularly useful if they could be shared among team members for quick reflection, for the purposes of making better practices as well as for building more coherent research community. In this research, we have developed a tool named ROG or Reflective Observation Grab, for recording sets of observation with its interpretation of classroom activities, to be shared on the web. The ROG was introduced to a college-level, collaborative classroom for evaluation. This paper reports some initial observations of the system.

ROG: Reflective Observation Grab
For learning science studies, it is now a common practice to collect process data from learning scenes. Video and audio recordings have been widely used, but such data usually require 5 to 10 times of the recording time to be converted into analyzable protocols and additional time for analysis. Additional interpretation is needed before they become sharable even just among the team members. On the contrary, it has been commonly observed that in a class, or at the meeting shortly after the class, the team members often exchange their interpretations of the activities occurring there as conjectures, to confirm their interpretations and to plan the adjustments of the teaching plan to accommodate the local needs.

In order to make this “hidden” practice visible and reflect-able, a tool named ROG, Reflective Observation Grab has been developed (Ito & Tanaka, 2005). The tool captures the images on the computer display while the students work collaboratively on it, on which the interpretations are handwritten by the teaching team members.

It also enables sharing the data among team members on a networked repository immediately after the class. It is implemented on a tablet PC for the ease of carrying it around in the class. Fig. 1 shows its operational screen on the tablet (left) and its repository view (right). The repository is developed onto a wiki, so that the teaching team members can not only share the data but also comment, for asynchronous discussion.

Observation
In year 2005, the system was used in one college level, collaborative class, and its data were tested from two perspectives, how it contributed to the community building support and a formative evaluation tool.

Research context
We have been exploring collaborative instruction to teach college sophomores introductory cognitive science. The research context we report here was a course involving repeated collaborative readings and explanations of short descriptions of basic research findings (Miyake, 2005a; 2005b). Their collaborative activities were supported by a concept-mapping tool called the Reflective Collaboration Note, which they could use through the Internet. The class size was 78, meeting once per week for 90 minutes for 13 weeks. The collaborative activities in this class were supported by a concept-mapping tool called the Reflective Collaboration Note (ReCoNote). The log-data from this tool, with audio records of all the students conversations, and the notes they took during the class consisted the data of the learning processes of the students. The data recorded on ROG were added on top of these, for quick reflection among the teaching team members.

Results
Four ROG systems were introduced to this class, used by two core members of the teaching team regularly, and shared among the four teaching assistants. On average, 12.7 sheets of memos per person were recorded on the ROG for each class, totaling in 955 sheets. On average, each sheet contained 3.6 statements of the observed facts and their interpretations for the core teachers, and 1.2 statements for the assistants. There were 104 combinations of captured screen images with interpretive comments, comprising some 11% of the entire data. Overall, the interface was subjectively evaluated as “usable” to “highly usable.”

To see what became more easily recordable, ROG data were compared to the audio record collected by the same
teacher teaching the same course in the previous year. The result of the comparisons is shown in Figure 2.

As can be seen, the teacher recorded more than ten times of interpretive data on the ROG, indicating the ease of keeping interpretive comments as data with the ROG. The voice recording is sequential, which makes it difficult to “comment reflectively” on the components of the target activities. ROG circumvents this problem, because the user can directly point to the parts s/he wishes to comment on the screen. Comments on ROG tend to describe students’ activities in detail, with interpretations on the facts.

The effects of ROG on community building
To see whether the ease of data sharing of the ROG contributed to the growth of the expertise among the teaching team members, the experts’ use was compared to that of less experienced members namely the teaching assistants during the course. The statements stored onto the ROG repository were classified into four categories: "flow" is comments on the control of the learning activities, "fact" were comments on observed learning activities, “interpretation” refers to interpretive comments on the observed facts, and "else."

![Figure 2: The voice data and the ROG data](image)

Fig. 2: The voice data and the ROG data

be mimicked by the less experienced members who increased the factual comments and their interpretations in the latter half of the course.

Carefully alllying this pattern with classroom activity developments, we conjecture that the pattern also reflects a type of division of labor which occurred as part of the community building. At the beginning it is necessary for the leading two core teachers to closely observe and interpret the students’ activities in detail, to quickly evaluation the validity of the overall plan and accommodate it to the reality. When this phase ends and the students were assigned materials to jigsaw, they rely more on local helps that the assistants could provide. The assistants in this phase can contribute more “facts and their interpretations” based on the roles they played. Toward the end, the needs for controlling the flow of the activities again becomes heavier so that the class “would end on time,” requiring more active involvements of the two core teachers.

The ROG as a formative evaluation tool
ROG is also expected to function as a formative evaluation support, or a tool for the team members to quickly reflect upon the development of the course so that they could accommodate to the local needs. This kind of course adjustment is often decided solely by the top-most expert, depending on her expertise alone, even when there are other members involved in the teaching. Contrary to this, if ROG allows quick collaborative reflection on happenings in each class, team members could quickly identify strengths and problems and discuss possible adjustments. To test this notion, the number of local adjustments were counted for the target class and compared to the same statistics taken from the previous year. There were twelve instances of course activity adjustments identifiable on the ROG record, compared to seven similar cases observable in year 2004, though the cases in year 2004 were more carefully analyzed compared to seven similar cases observable in year 2004, though the cases in year 2004 were more carefully analyzed during the TA discussions after the class, which was often omitted and replaced by the asynchronous discussion on the web in year 2005.

Discussion
An interpretation logging tool for classroom activities was developed and tested, yielding some positive data. A new tool like this one requires a certain amount of time to find its niche in everyday practices. Further evaluation is underway to make clear the value of integrating this.

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References
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