

Supporting Groups to Monitor Themselves: Does It Distribute the Interaction?

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Abstract: The driving questions of this study were how we can support groups to monitor themselves for collaboration, and how it will impact the interaction. Upon the lens of socially shared regulation, a tool to support monitoring for the group was designed and implemented in an experimental setting. The results showed that the teams who used the monitoring support tool for the group had lower centralization, which means more distributed interaction.

Introduction

Monitoring is known as one of the essential mechanisms that improve the process of learning (Winne et al., 2013). Although it is not a newly emerging idea to support monitoring for learning, the way to support monitoring depends on the context. Monitoring for collaboration, in particular, needs to take different approaches from the way to support individual learning; individuals and groups are intrinsically different agents of collaboration. In individual learning, a learner can focus only on the learning process and outcome of oneself. In collaborative learning, learners need to monitor not only understandings or strategy usages of each member but also the dynamic interaction of a group because reciprocal influences between learners continuously take place during collaboration.

Then, how can we support a group to monitor themselves? To answer the question, this study sees the collaboration through the lens of socially shared regulation of learning (SSRL) that well describes the mechanism of monitoring of a group. SSRL refers to the "group's deliberate, strategic, and transactive (Hadwin et al., 2018; pp. 86)" regulation which involves deeply metacognitive control over the group process. When monitoring is socially shared, group members deliberately, strategically, and transactively monitor the whole group.

Design considerations for supporting socially shared monitoring

Existing studies on SSRL have revealed the following three design considerations. Firstly, the focus of monitoring needs to be placed on a group, not on an individual in a group. What distinguishes SSRL from self- or other-regulation is a perception of the we-ness (Cho & Lee, 2019). A commonly used way to support monitoring in existing tools, presenting the level of participation or prior knowledge of each member, usually lead learners to give attention to the one who participates the least or the one who has the lowest level of prior knowledge. Hence, each member's information needs to be presented anonymously, or the unit of information should be a group, not an individual (e.g., Järvenoja et al., 2017; Kwon et al., 2013).

Second, the learning goal to be compared to the current state of learning needs to be set first individually, and then by negotiation with group members. In the context of collaborative learning, Winne and colleagues (2013) stated that learning goal is established through the negotiation of a group, in a way to maximize individuals' learning goal. This implies that enough time or opportunities to set one's own goals need to be provided for learners before the group's negotiation. The example can be found from Miller and Hadwin (2015).

Third, learners need to externalize the socially shared monitoring process. Järverlä and colleagues (2016) suggested that the technology to support SSRL should be designed in a way to help learners externalize SSRL. Kwon and colleagues (2013) also suggested the design principle that to support the group's metacognition, group members need to intentionally provide information for monitoring. Externalizing the metacognitive process provides opportunities for learners to learn how to monitor the collaboration.

Distributed interaction resulting from socially shared monitoring

By supporting socially shared monitoring, interaction is expected to be distributed. Hadwin and colleagues (2018) described SSRL as a series of regulations between learners, which is transactive. The transactivity of SSRL implies its unique interaction patterns. Firstly, if other-regulation (a learner regulating specific others in a group) is salient in a team, then learners will regulate others but not reciprocally. Secondly, if self-regulation (a learner regulating oneself) is dominant in a team, then the messages each learner sends will be egocentric. On the other hand, the messages from each learner are closely interrelated and interdependent in a completely group-centric group because the messages are referential to the previously stated message from other members (Hewes, 2009). When monitoring is socially shared, learners are expected to engage more in mutual regulation so that the interaction pattern will become more balanced and distributed.

Research design

To examine the effect of supporting group's monitoring, 47 female college students majoring in education were recruited and randomly assigned to six control groups and six experimental groups. An instructional design task consisting of two phases was assigned to each team. The first phase was individually reading the problem scenario about digital literacy (3-5 minutes). The second phase was collaboratively designing a course (90 minutes). The experimental group participated in two additional activities. The tool to support additional activities was designed based on the three design considerations. The first activity was to set the goal for monitoring. After the first phase, learners were asked to choose among four pre-defined options; what they will monitor during collaboration, first individually, then with the group. The other additional activity was externalizing the monitoring process in the second phase. Previously selected group goals were presented with buttons named *monitoring required* and assigned four different colors (blue, green, yellow, and red). While discussing, learners were allowed to click the button whenever they thought the group work was not going well. This activity was performed individually, but the result was presented back to the whole group as a sign with a color based on the traffic-light metaphor.

For data analysis, Social Network Analysis (SNA) was conducted to compare the centralization of experimental and control groups. Centralization is a group-level index that represents how much the interaction is distributed to the nodes in a network (Scott, 1991). Since the number of groups was too small to compare, a test to examine the statistical significance of the difference was not conducted. Instead, centralization indices of all groups were converted to rank-order, and the sums of the rank of each condition were compared. The larger the rank-sum, the bigger the number of groups with low centralization.

Results and discussion

The centralization indices of the experimental condition was relatively smaller than the control condition. The rank-sum of experimental groups was bigger than the rank-sum of control groups (experimental groups: 47.5; control groups: 30.5). Although the statistical significance of the difference between two conditions was not analyzed, this tendency showed that monitoring support for a group was related to the lower centralization. This means that the interaction of an experimental condition tended to be more distributed than the control condition. Therefore, supporting group-level monitoring seemed to facilitate interaction to be distributed.

Although the sample size was too small so that statistical significance could not be tested, the contribution of this study lies on the fact that the design considerations suggested based on the findings from previous SSRL studies were examined, with its impact on the learning process.

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