

Fostering Awareness Content Creation by Self-Determined Regulation

Tanja Engelmann, Katrin König, and Michail D. Kozlov, Knowledge Media Research Center
t.engelmann@iwm-kmrc.de, k.koenig@iwm-kmrc.de, m.kozlov@iwm-kmrc.de

Abstract: Prior studies have shown that without explicit instruction participants do not create complete awareness contents. Group awareness tools work implicitly. In this study it is investigated whether the construction of awareness contents can also be encouraged implicitly. Based on the self-determination theory it is expected that implicit regulation is more effective than explicit instruction. First results suggest that this is indeed the case.

Introduction

Experts of different areas are needed to solve complex problems. Often, they can only communicate via internet due to time constraints and large distances. In this setting, misunderstandings can occur due to reduced context information. In order to prevent misunderstandings and communication problems, different tools were developed to foster *group awareness* that is defined as “consciousness and information of various aspects of the group and its members” (Gross, Stary, & Totter, 2005, p.327). A subtype of group awareness is *knowledge and information awareness* (KIA) that is defined as being informed on the collaborators’ knowledge and information underlying this knowledge (Engelmann & Hesse, 2010). Several studies have shown that groups provided with a KIA tool that visualizes the collaborators’ knowledge and information by digital concept maps perform better in a problem solving task (e.g. Engelmann & Hesse, 2010). In contrast to such studies in which the participants received individual concept maps pre-created by experts, Engelmann and Kolodziej (2012) examined what happens if group members create their individual concept maps on their own. It was shown a.o. that group members did not create complete maps resulting in a less effective KIA tool compared to that in studies with pre-created maps. The aim of the current study was to examine how team members can be motivated to create complete maps. Awareness approaches themselves work implicitly by providing task-relevant information without using explicit instruction. It can be assumed that the construction of awareness contents can also be encouraged implicitly. Explicit approaches, which directly instruct group members what to do, for example through collaborations scripts (e.g. Kollar, Fischer, & Hesse, 2006) already exist. In a study by Engelmann, Kolodziej, and Hesse (2014) explicit instruction was successful as all participants followed this instruction. However, implicit instructions should exceed explicit instructions: Providing prospective meta-knowledge to the participants is one example for an implicit instruction (Cress, 2005). According to Cress (2005), informing a person that an activity is important for the other team members increases the probability that the person performs this activity. Thus, arguably, emphasizing the importance of creating an individual map will lead to less disruptions of the task and to a higher map quality. Hence, in the current study, two different kinds of instruction are compared: an *explicit instruction* instructing the participants to first create an individual map of their own knowledge and information before they start with the collaboration as well as an *implicit instruction* in which the group members are not explicitly told what they should do but are informed about former study results which showed that groups with access to the concept maps of their team members performed better than groups without access to them. It was expected that both instructions would encourage the group members to start creating an individual map. However, according to the self-determination theory by Deci and Ryan (1993) it was assumed that the implicit instruction leads more often to finishing the maps, while the explicit instructions leads more often to discontinuing the map creation. Deci and Ryan differentiated several levels of extrinsic motivation by their degree of self-determination: For example, *external regulation* refers to people acting because they receive a reward or avoid punishment. *Introjected regulation* refers to behavior people show because otherwise they would feel anxiety or guilt or because they want to gain positive feelings like higher self-esteem. It was expected that the explicit instruction would evoke these less self-determined types of motivation. In *identified regulation* the goals of action are accepted as one’s own goals. It was expected that the implicit instruction would lead to this self-determined regulation type: As the participants were provided with information guiding their actions without receiving an explicit instruction, they should feel like they decided independently how to proceed. Self-determined forms of motivation reduce the probability to discontinue a task before completion (Vallerand & Bissonnette, 1992). Additionally, the performance in learning situations is improved and cognitive processing is deeper (Krapp, 1993). Therefore, it was expected that both instruction types encourage starting to create an individual map, but that the implicit instruction will more often lead to the completion of the maps.

Methods

Participants

93 participants (34 male) with an average age of 24 years ($SD=3.49$) took part in the study. They were randomly assigned to the two conditions resulting in 15 explicit and 16 implicit groups (triads). There were no significant differences between the conditions w.r.t. gender composition ($F<1$) and acquaintance of the members ($F<1$).

Material and Procedure

The criminal case the triads had to solve is based on a task by Schreiber and Engelmann (2010). First, the participants filled out a questionnaire for measuring control measure items. Then they practiced to create digital concept maps. In the main phase they were informed that they will assume the roles of detectives who together have to identify a murderer. The triad members each received a text document with unshared hints that had to be combined to solve the case. The members worked in separate workspaces. The members had to read a document containing all “their own” hints. Afterwards, each member had to indicate whom they suspected to be the murderer to differentiate between the individual and the collective solution. Then the members were motivated implicitly or explicitly to create their own concept map representing their individual knowledge and information as well as to start with the group discussion. In this collaborative phase, all participants could see their own working window, the working windows of their collaborators, and a group working window. The members could choose to either create their own individual maps in their own individual working window or to start working on a group concept map in the group window. In this phase they could communicate via headsets. They had 50 minutes to choose the murderer and give reasons why they suspect him/her. Afterwards, they filled out another questionnaire including questions concerning their motivation to create an individual concept map.

Results and Discussion

All analyses were made on the group level as the individuals of a group were not independent of each other. First results showed that the members of the implicit groups needed significantly less time ($M=34.7$ min) than members of the explicit groups ($M=41.5$ min) to agree on their later solution ($F(1,29)=5.6$; $p<.05$). Furthermore the implicit groups needed significantly less time until they had written their final answer ($F(1,29)=4.6$; $p<0.05$). Furthermore, the members of the implicit groups perceived a stronger improvement of group collaboration over time than the explicit groups ($F(1,29)=10.7$; $p<.01$). These preliminary results point to the expectations that groups with implicit regulation performed better in the task in terms of time needed. Further analyses for example regarding the motivation of the participants and the quality of the individual maps are in progress.

References

- Cress, U. (2005). Effekt des Metawissens beim kollaborativen Aufbau eines Informationspools. *Zeitschrift für Medienpsychologie*, 17, 147-156.
- Deci, E.L. & Ryan, R.M. (1993). Die Selbstbestimmungstheorie der Motivation und ihre Bedeutung für die Pädagogik. *Zeitschrift für Pädagogik*, 39, 223-238.
- Engelmann, T. & Hesse, F.W. (2010). How digital concept maps about the collaborators' knowledge and information influence computer-supported collaborative problem solving. *International Journal of Computer-Supported Collaborative Learning*, 5 (3), 299-320.
- Engelmann, T. & Kolodziej, R. (2012). Do virtual groups recognize situations in which it is advantageous to create digital concept maps? In A. Cañas, J.D. Novak. & J. Vanhear (Eds.), *Concept Maps: theory, methodology, technology. Proceedings of the 5th International Conference on Concept Mapping* (Vol. 1, pp. 172-179). Malta: University of Malta.
- Engelmann, T., Kolodziej, R., & Hesse, F. W. (2014). Preventing undesirable effects of mutual trust and the development of skepticism in virtual groups by applying the Knowledge and Information Awareness Approach. *International Journal of Computer-Supported Collaborative Learning*, 1-25.
- Gross, T., Stry, C., & Totter, A. (2005). User-centered awareness in computer-supported cooperative work-systems: Structured embedding of findings from social sciences. *International Journal of Human-Computer Interaction*, 18, 323-360.
- Kollar, I., Fischer, F. & Hesse, F.W. (2006). Collaboration scripts: A conceptual approach. *Educational Psychology Review*, 18 (2), 159- 185.
- Krapp, A. (1993). Die Psychologie der Lernmotivation. *Zeitschrift für Pädagogik*, 39, 187-206.
- Schreiber, M., & Engelmann, T. (2010). Knowledge and information awareness for initiating transactive memory system processes of computer-supported collaborating ad hoc groups. *Computers in Human Behavior*, 26, 1701-1709
- Vallerand, R.J., & Bissonnette, R. (1992). Intrinsic, extrinsic, and amotivational styles as predictors of behavior: A prospective study. *Journal of Personality*, 60, 599-620.