Evaluating Virtual Collaboration Over Time – A Pilot Field Study

Birgitta Kopp and Heinz Mandl, Ludwig-Maximilians-University, Leopoldstr. 13, 80802 Munich,
Email: birgitta.kopp@psy.lmu.de, heinz.mandl@psy.lmu.de

Abstract: This pilot field study investigated the evaluation of virtual collaboration and of support methods over time asking 32 undergraduates studying pedagogy with a survey questionnaire at three points of time. Results indicate a specific evaluation pattern showing that at all three points of time, taking responsibility was evaluated lowest. Furthermore, correlation analyses showed that the support of designing group work was connected significantly with taking responsibility indicating a positive influence for supporting virtual collaboration.

Introduction and Theoretical Background

In CSCL research, there is insufficient discussion on learners' subjective perception of the collaboration process and of support methods. Furthermore, the question is how learner's evaluation on these two dimensions changes over a period of time. Another issue is to look at the correlations between virtual collaboration and support methods. Therefore, this paper deals with these three issues.

Looking at the collaboration process first, main dimensions include the task and the social level of collaboration. The task level involves goal orientation and task completion, the social level group cohesion and taking responsibility (Kauffeld, 2001). The main issue is to see how these dimensions develop in evaluation over time.

Second, as virtual collaboration needs support we included two support methods, namely the design of group work (the assignment of roles and group rules), and providing feedback on the performance and worked examples to see, how these means are effective for online collaboration.

Third, looking at the theoretical and empirical background, there is no indication on how group members themselves evaluate their collaboration over time and whether there are changes regarding group processes. Furthermore, the development of support on collaboration over a period of time has not yet been investigated. Specifically, the question is whether support is more effective at the beginning than at the end.

Research Questions

Based on the theoretical background, we investigated three research questions, namely

1. How do students evaluate virtual collaboration and support methods?
2. To what extent do evaluations differ over time?
3. To what extent do the design of group work and feedback correlate with virtual collaboration over time in terms of goal orientation, task completion, cohesion, and taking responsibility?

Method

Object of Investigation

We investigated the seminar on "Attachment Theory". Didactically, the seminar followed a problem-based approach asking learners to apply collaboratively their theoretical knowledge to authentic problems from multiple perspectives and contexts in the field. To support online collaboration, we included two methods: designing the group work (assignment of roles, and definition of group rules), and providing learners with feedback (feedback on the individual group's solution, and worked examples).

Sample and Design of the Study

Thirty-two undergraduate students majoring in pedagogy took part in the survey study. They were divided randomly into eight groups with four members. All students filled in an online questionnaire regarding support methods and the virtual online collaboration at three points of measurement beginning five weeks after the start of the seminar and continuing two more times every four weeks.

Data Sources

We developed a questionnaire focusing on online collaboration and support methods. To evaluate collaboration, we used the questionnaire for teamwork by Kauffeld (2001) with four dimensions, namely at the task level, goal orientation and task completion, and at the social level, group cohesion and taking responsibility. We used a six-point Likert scale ranging from 1 ("do not agree") to 6 ("totally agree"). To measure support methods, we used again a six-point-Likert scale from 1 ("not effective at all") to 6 ("very effective") asking how effective certain support was for group work.

Data Analyses

In a first step, we calculated the descriptive statistics of the relevant dimensions at the three different points in time. Second, we looked at differences between the single dimensions using t-tests for paired samples. In a third step, we calculated the differences of the single dimensions between the three points of time using t-tests for paired samples. Fourth, we correlated the dimensions on collaboration with the dimensions of support methods using a Pearson's one-way correlation analysis. The level of significance was .05.

Results

Research Question 1

Students evaluated virtual collaboration and support methods on a very high level with low standard deviation at all three time intervals. T-test analyses showed significant differences at all three points of time, showing that taking responsibility was evaluated lowest, followed by goal orientation. Regarding support methods there was only one significant difference at the first point of measurement ($t(31)=2.57$; $p<.05$).

Research Question 2

Looking at the development of the virtual collaboration, the evaluation remains homogenous. T-Test showed one significant difference between the first and second point of time, namely between the evaluation of task completion ($t(29)=2.15$; $p<.05$). Looking at the support methods, there was also one difference between the first and second point of time in the evaluation of providing feedback ($t(29)=-2.97$; $p<.01$).

Research Question 3

Results show that group design positively correlates with all four dimensions of collaboration at the first and second point of time, and with the two social dimensions of group cohesion and taking responsibility at the third point of time. These correlations are significant. The correlation is on a medium to high level with the highest scores at the second point of measurement. Providing feedback significantly correlates only once with taking responsibility at the first point of measurement. There were no further correlations between support methods and the collaboration process.

Discussion

There are three main results: First, the evaluation shows a specific pattern. Looking at collaboration, task completion was evaluated highest, followed by group cohesion, goal orientation, ant taking responsibility indicating that possibly not all group members feel in the same way responsible to fulfill their joint group solution, eventually due to the missing social presence in virtual learning environments. Nevertheless, the main purpose of the virtual seminar to solve tasks together was very much internalized by the students. Regarding support methods, the design of group work was evaluated higher than providing feedback, which also stayed stable over time. A reason for this may be that group design affects the collaboration process itself, while the feedback was given after the respective task completion which may be of interest for the next task solution, but not for the direct collaboration process. Second, regarding the development of the virtual collaboration, the evaluation of group processes and of support methods stayed almost stable over time. Third, group design correlates almost always with all dimensions of the collaboration. The design of group work influenced directly the group processes. Looking at the extent of the correlation numbers, they are highest at the second point of measurement. This may be explained with the stages in group process by Tuckman (1965). Possibly, in the middle of the semester, the groups were in the storming and norming stage, in which concrete rules how to collaborate and a moderator who leads the group process, is of great relevance for the learners. Because of this, support and group processes were highly related to each other.

Educational Significance

Results indicate that according to the subjective evaluation data, there is a positive relation between support methods and group interaction which justifies the necessity of support for computer learning even based on this subjective evaluation data. Especially problematic social phenomena are strongly related to the given instructions of group design. Therefore, support that affects the collaboration process is an essential part in virtual collaboration.

References

Kauffeld, S. (2001). *Teamdiagnose*. Göttingen: Verlag für Angewandte Psychologie.
Tuckman, B.W. (1965). Developmental sequence in small groups. *Psychological Bulletin, 63*(6), 384-399.