Do social skills play a role in collaborative project-based learning?
Impact of the distribution of perceived social skills within learning groups in a Computer Supported Collaborative Learning- setting: An empirical pilot study

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Abstract: The pilot study looks for empirical answers to the following question: What distribution of perceived social skills within learning groups is predictive for group member's degree of satisfaction with group performance and quality of collaboration? Data collection took place with two questionnaires at the beginning and the end of semester. The analysis of 20 learning groups (N = 59 teacher training students) revealed the following trends: High exchange orientation (i.e. being able to cooperate, compromise, resolve conflicts etc.) and high assertiveness within groups are associated with more satisfaction concerning collaboration quality and group performance. Heterogeneous groups with low group-means of the social skill exchange orientation were less satisfied with their work and stated to be less efficient in collaboration than other groups.

Research design

The present study was conducted with 59 students of the University of Teacher Education Pädagogische Hochschule Bern. The students participated in a media education course and had to work on a media project in groups of two or three during three months. Our research questions were:

1. Which individual social skills are predictive concerning satisfaction and quality of cooperation, in a collaborative project-based learning setting?

And on a group level:

2. Which configuration of social skills within the learning group is perceived by the group members to be effective for successful project-based collaborative learning?

At the beginning of the course all students completed a self-assessment questionnaire (pre-questionnaire) about their social skills. At the end of the project, students filled in a questionnaire covering their satisfaction with the project and their perceived quality of collaboration. 59 students (20 project-groups) completed pre- and post-questionnaire.

Self-assessment of individual social skills (pre-questionnaire)

The questionnaire contained 16 self-referential statements for which students had to choose between four responses (totally agree – totally disagree).

Indicators of satisfaction and quality of cooperation towards the end of the project work (post-questionnaire)

To measure satisfaction with the achieved project work and the quality of collaboration we used the following six questions with four possible responses (totally agree: 4 – totally disagree: 1):

1. I am satisfied with the achieved level of team work (satisfaction)
2. The group worked together in an efficient way (efficiency)
3. The responsibilities were clearly distributed within the group (division)
4. There was a group leader (centralized management)
5. We got along well within the group (harmony)
6. We supported each other and / or complemented one another well within the group (support).

Results

Self-assessment of perceived individual social skills

In order to reduce complexity we tried to find similar answering behavior within the 16 asked questions.
The items of the questionnaire were reduced to higher-level factors using principal component analysis (pca). The extracted five factors explained 67% of the variance. All factor scales had satisfactory internal consistency between (Cronbach's alpha: $0.698 \leq \alpha \leq 0{,}817$). We labeled the five factors: exchange orientation, empathy, initiative, leadership and assertiveness.

Correlation between social skills factors (of pca, first questionnaire) (pre questionnaire), indicators of work satisfaction and perceived quality of cooperation (post questionnaire) and within items of the post questionnaire

The social skills correlated to various items concerning satisfaction and perceived quality of collaboration. Highly significances ($p<0.01$) were found between 'satisfaction in work' and 'collaboration efficiency' $r(59) = .43$; satisfaction in work and 'distribution of work' $r(59) = .36$; 'collaboration efficiency' and 'distribution of responsibilities' $r(59) = .49$; collaboration efficiency' and 'group leader $r(59) = .53$; collaboration efficiency', and 'mutual support $r(59) = .63$; 'group harmony' and 'mutual support' $r(59) = .56$; distribution of responsibilities and mutual support $r(59) = .43$. Significant correlations ($p<0.05$) could be found between 'distribution of responsibilities' and 'group leader' $r(59) = .43$; 'empathy' and 'satisfaction with work' $r(59 = -.30$; 'empathy' and 'collaboration efficiency' $r(59) = -.28$ and 'empathy' and 'mutual support' $r(59) = -.27$.

Proposal of a possible way to combine the results of the analysis of individual social skills and the interindividual (group related) specificity of different social skills

The quality of collaboration within groups is not singularly based on the individual group member - level of a particular social skill (e.g. exchange orientation). Rather a systemic view might be appropriate, were a group consisting of persons with both high and low individual levels of a particular social skill will likely perform differently than groups were the members perceive the same or a more comparable level of the concerned social skill. We call this pattern of individual social skills within a group the skill - configuration.

In order to analyze how satisfaction and quality of collaboration within groups was dependent on the skills configuration, we split the sample for each of the five skills (see pca) into homogeneous and heterogeneous groups (based on the average range between group members with the highest and with the lowest skills level) and in groups that showed a high or a low average group level of the skill. Thus, for each social skill, four group types could be differentiated: HOLO: homogeneous group with low means in a specific social skill; HELO: heterogeneous group with low means of the focus social skill; HOHI: homogeneous group with high means of the focus social skill, and HEHI: heterogeneous groups with high means of the focus social skill. Using group typologies based on homogeneity/heterogeneity and average skills level showed various promising effects in our pilot study even considering that the range of heterogeneity within the heterogeneous groups was quite small:

Performing several analyses of variances (ANOVA) we could find the following results:

- Exchange orientation: (HELO groups were less satisfied with their work, $F(1,18) = 5.589$; $p < .001$, and less efficient in collaboration, $F(1,18) = 12.447$; $p < .001$) than the three other group types. Thus, a low exchange orientation is a threat to work satisfaction and collaboration quality only, when group members show different levels in this skill. Presumably, it is the high exchange oriented group members that suffer the most in this kind of skills configuration. Initiative: HOLO groups were less supportive and complementary than the other three group types, $F(1, 19) = 3.455$, $p < .10$. For HELO groups such an effect was not found. To have no group members that act socially initiative is therefore especially disfavorable to mutual support giving.
- Leadership: HOHI groups had a more efficient collaboration than groups of types HEHI and HELO,$F(1, 19) = 2.906$; $p < 0.10$). Many high leadership oriented people make for efficient collaboration within a group. However, groups that show a homogeneous skills configuration with respect to leadership (HOHI and HOHE) have less often a centralized leadership than heterogeneous groups (especially HEHO), $F(1, 19) = 4.376$, $p < .05$.
- Assertiveness: Members of HOLO and HELO groups reported to have lower mutual support than members of HOHI groups. $F(1, 19) = 2.705$, $p < .10$.

Multilevel analysis might also be valuable for our data but for our pilot study with a small amount of participants and groups we did not consider the multi-level approach. In our ongoing study with a lager amount of groups and participants multi-level analysis approach will be compared to the described method in the pilot. The major problems we encountered in our pilot concerned the reduction of complexity and the interactions between the parameters on individual level and on group level.

References

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