Scripts for Facilitating Computer Supported Collaborative Learning

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INTRODUCTION

Many distance learning scenarios, for example, virtual seminars, use collaborative arrangements for learning. By applying them, they offer learners the chance to construct knowledge collaboratively. However, learners often do not possess the skills necessary for a beneficial collaboration. It is therefore important that learners are offered support in these learning scenarios. Scripts for collaborative learning can provide support. They can guide learners through their collaboration process (Ertl, Kopp, & Mandl, 2007b) and help them to acquire collaboration skills (Rummel & Spada, 2005).

Scripts for collaboration were originally developed in order to support text comprehension. They facilitate two or more learners—who are similar as far as their existing knowledge and learning strategies are concerned—in their efforts to understand contents provided by theory texts. Collaboration scripts split this process into a sequence of smaller steps, assign each learner to a particular role, and offer a number of comprehension strategies, such as questions, feedback, and elaboration. Each one of these learners has a defined role to play, which in turn is associated with certain strategies and varies within the different phases.

One example of a collaboration script is the so called MURDER script (Dansereau, Collins, McDonald, Holley, Garland, Diekhoff et al., 1979; O'Donnell & Dansereau, 1992). It was originally developed to help individuals with text comprehension, and was then increasingly used in pair and group work. The MURDER script divides the learning process into six phases and introduces individual and collaborative activities. Learners begin in Phase 1 by preparing themselves for the task ahead (mood). In Phase 2 they then each read the text for themselves, and pay particular attention to its main arguments and facts (understand). One partner (Partner A) then repeats the content from memory (repeat), and the other gives feedback and clarifies any discrepancies or misunderstandings (Partner B; detect). Phase 5 involves the learners working together and elaborating the text by connecting it to their existing knowledge and experiences, and sometimes by using imagery (elaborate). In the final phase, the learners go over the text again (review). These six phases can be repeated for several text paragraphs. Partners A and B take turns in repeating and detecting mistakes in the content.

This example clearly demonstrates the basic characteristics of a collaboration script:

- Learners work their way through the text step-by-step (sequencing)
- Learners are given different roles to play, for example, the "repeater" or the "detector" (assignment of roles)
- Collaborative use of strategies to aid comprehension (collaborative strategy use)

Much research was dedicated to the use of collaboration scripts in text comprehension (e.g., O'Donnell & Dansereau, 1992, 2000; Palincsar & Brown, 1984; Patterson, Dansereau, & Newbern, 1992), particularly as this skill is of great importance in school and university education. A number of studies have confirmed the

positive effects of the scripts on learning. Rosenshine and Meister's (1994) metastudy, for example, provides an overview of existing results.

BACKGROUND

In order to understand how collaboration scripts work, it is necessary to view each characteristic, especially sequencing, role assignment, and collaborative strategy application, individually.

Sequencing

The creation of a number of different steps according to which task should be carried out is one of the most basic characteristics of a collaboration script, but at the same time, it is one of the least specific. An example of these different steps is the aforementioned MURDER script. The sequencing is particularly good for collaborative learning, as it shows the learner how best to carry out the task at hand and provides an effective strategy to do so (Kollar, Fischer, & Hesse, 2003; Weinberger, 2003). However, the issue is raised as to whether a sequencing of various subtasks in itself can have an effect on the learning results, or whether it merely provides a framework in which the learner can assume various roles and hence work through the text.

Assignment of Roles

The assignment of roles may have two effects on the process of collaboration itself. First, certain internal strategies or images can be applied (Dreitzel, 1972). According to the role taking theory, a learner that has been assigned to the role of an "explainer" is more likely to apply strategies the learner has experienced from other people that the learner saw as talented "explainers" of new concepts. A learner in the role of "examiner" is more likely to ask critical questions. However, these strategies, which the learner associates with the given roles, do not necessarily have a positive effect on learning; particularly if the learner lacks a certain distance to the allocated role (Dreitzel, 1972). If, for example, a learner has a particularly authoritarian view of a teacher, the learner may apply this to the learning situation and thereby prevent comprehension questions and discussion. In order to avoid this kind of situation, the strategies that are applicable to each role must be well trained in advance (Rosenshine & Meister, 1994), and it is important that each learner gets a chance to take on all of the roles. Second, the assignment of roles may result in the learners learning more actively. The learner who assumes the role of the teacher or explainer may particularly benefit from the collaboration script, as the role is connected with an active function (Renkl, 1995). Studies have shown that learning by teaching has a strong positive effect on learning (Renkl, 1995).

Collaborative Use of Strategies

The sequencing of tasks and assignment of roles usually only provide the framework for the collaborative use of text comprehension strategies by learners (Reiserer, 2003). The strategies are usually based on strategies for use by individuals (Mandl, Stein, & Trabasso, 1984). The individual strategies acquire new qualities through the collaboration between the learning partners, particularly the questions, feedback, and explanations. Throughout most phases of the collaboration script, the collaboration partners use different strategies, which are well suited to each other and to the learning phase (O'Donnell & King, 1999; Palincsar & Brown, 1984; Reiserer, 2003; Rosenshine & Meister, 1994; Rosenshine, Meister, & Chapman, 1996).

The influence of typical strategies in collaboration scripts was summarized in the aforementioned metastudy by Rosenshine and Meister (1994). The original studies, upon which the metastudy was based, involved between 2 and 10 strategies for intense study of the material in reciprocal teaching.

The four basic strategies in the reciprocal teaching approach are:

- **Clarifying:** The learners test how well they have understood the text by clarifying issues in it. The answering of the questions inspires them to place more emphasis on particular information, whereby the partner who is asking the questions has the opportunity to clarify any misunderstandings. Brady (1990) found positive effects of clarifying in a study, but made the point that these effects are dependent upon the difficulty of the theory text used.
- **Summarizing:** The summarizing of the text passages is a further strategy. The learners have to focus on the basic message of the text and