Chapter 2

SCRIPTING COLLABORATIVE LEARNING PROCESSES: A COGNITIVE PERSPECTIVE

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Abstract: Scripting collaborative learning is an effective approach to promoting learning in both face-to-face and on-line computer learning contexts. Although the term script originated in cognitive psychology, it is used in educational contexts to describe ways of structuring interaction and scaffolding collaborative learning through the use of roles, activities, and sequencing of activities. There are several specific types of learning activities that numerous lines of research have shown enhance learning during interaction, however, these activities rarely occur spontaneously during naturally-occurring group collaboration. Also, it is not always clear what individuals learn during collaboration, how they learn it, and the underlying cognitive mechanisms that account for learning collaboratively. Four illustrative approaches to scripting face-to-face collaboration are presented. Each approach is examined to reveal how roles, activities, and sequence of activities, are used to structure collaborative learning and what particular cognitive, metacognitive, and socio-cognitive processes their scripts are intended to induce in learners. The expectation for some scripts is that over time learners will internalize the roles, activities, and sequence; and, once learners can play all of the roles of a script on their own, they will self-regulate their learning without the aid of an external script. However, the wide range of differences in both the complexity and goals of scripts affects their potential for internalization, and some external scripts are not intended to be discontinued even if roles are internalized.

A large body of research has shown that collaborative approaches to learning can be effective in producing achievement gains, promoting critical thinking, and enhancing problem solving in both face-to-face learning contexts (e.g., Cobb, 1988; King, 1989; Webb, 1989; Webb & Palincsar, 1996) and more recently in computer-supported learning environments (e.g., Weinberger, Fischer, & Mandl, 2002).

From a cognitive perspective, learning is defined as cognitive change or conceptual change; that is, some form of reorganization and reconstruction
of the learner's own knowledge. This change occurs as connections are made between the new material and prior knowledge and are integrated into the learner's existing knowledge base. From a socio-cognitive perspective (e.g., Mugny & Doise, 1978, Vygotsky, 1978), these cognitive changes are strongly influenced by interaction and activity with others.

Any interaction with another provides opportunities for learning to occur; however, some forms of interaction and activity have been found to be more effective in facilitating learning than others. For example, giving explanations is more effective than receiving them (Webb, 1989). And helping behavior that supports others' problem solving by offering cues and hints that guide them to achieve a solution on their own is more effective in promoting learning than helping by simply providing the right solution. Moreover, it appears that different levels of verbal interaction promote different kinds of learning (e.g., Chan, Burtis, Scardamalia, & Bereiter, 1992; King, 1994; Webb & Palincsar, 1996) and are therefore conducive to different kinds of learning tasks. For example, factual questioning and responding tend to be effective for knowledge retelling tasks because fact questions tend to elicit facts. However, fact questions are less effective for complex learning tasks which involve analyzing and integrating ideas, constructing new knowledge, and solving ill-structured problems, as they seldom elicit the required thoughtful responses (Cohen, 1994; King, 1994).

Unfortunately it is rare for collaborating learners to spontaneously use effective interaction procedures and match them to the task at hand without some form of explicit prompting or other guidance (Bell, 2004; Britton, Van Dusen, Glynn, & Hemphill, 1990; Cohen, 1994; King, 1994; King & Rosenshine, 1993; Kuhn, 1991). Indeed, even when given instructions to work collaboratively on a task, learners generally tend to interact with each other at a very basic level (Vedder, 1985; Webb, Ender, & Lewis, 1986) and do not even consistently activate and use their relevant prior knowledge (see Pressley, McDaniel, Turmure, Wood, & Ahmad, 1987). For this reason, numerous attempts have been made to promote learning by structuring and regulating the interaction within collaborating groups so that learners are required to interact in ways that induce cognitive processes appropriate to their learning task. Such structures compel learners to assume designated roles, follow a prescribed sequence of activities, and sometimes even engage in a particular pattern of dialogue (e.g., Dansereau, 1988; King, 1997; Palincsar & Brown, 1984; Pressley, Symons, McDaniel, Snyder, & Turmure, 1988; Webb & Farivar, 1994).

These methods of structuring interaction have generally been referred to variously as "scaffolding learning", "prompting thinking", "using problem solving supports", "guiding cognitive performance", and "strategy instruction". However, recently the term scripting collaboration has appeared in the