Chapter 5
Linking CSCL Script Design Patterns: Connections between Assessment and Learning Patterns

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ABSTRACT
Among the fields in which design patterns have been applied, the design of CSCL scripts has received the attention of the e-learning research community. The usage of design patterns is justified by the complexity of the task of planning collaborative learning scenarios. Making this task even more complex, planning assessment activities and/or resources is one of the aspects that need to be taken into account in the design of a CSCL script. Focusing on this issue, this chapter deals with the application of learning and assessment patterns along with the creation of such scripts. More specifically, this chapter is focused on the potential benefits of using detailed information concerning the relationships between assessment and learning patterns. Different types of links between CSCL scripting design patterns are illustrated, and finally this chapter discusses the possibilities of using them in CSCL script authoring software tools.

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Design patterns have found a challenging field of application in CSCL (Computer Supported Collaborative Learning). While design patterns were developed initially in so different domains as architecture (Alexander et al., 1977) and computer science (Gamma, Helm, Johnson, & Vlissides, 1995), the task of designing collaborative learning activities, with or without computer support, has also been tackled by the use of design patterns. This has been motivated by the complexity of CSCL: designing collaborative scenarios has been regarded as a challenging task (Kollar, Fischer, & Hesse, 2003; Dillenbourg, 2002), especially in the case of inexperienced designers, such as educators or practitioners. Second, as discussed below, several research works have shown that it is possible to identify good practices in structuring different aspects of collaborative learning.

The challenge posed by the complexity of collaborative learning has motivated an active research activity on the field of scripting in CSCL. It has been argued that simply asking students to carry out certain activities collaboratively does not necessarily result in effective students’ interactions that promote learning. With respect to this, CSCL scripts have been proposed as a mechanism to create the required conditions that increase the chance of such interactions (Dillenbourg, 2002). CSCL scripts can be used to define different aspects of collaborative learning situations, in order to guide or constraint the activities that the participants carry out. In this chapter we focus on macro-scripts (Dillenbourg & Tchounikine, 2007), which model “activity flows”, including the organization of sequences of activities or the group formation policies that are used to create groups along the script. For instance, the well-known macro-script ArgueGraph (Dillenbourg, 2002) attempts to foster discussion among students by means of a certain sequence of activities and grouping policy: students at one point are grouped in pairs, in such a way as to maximize the difference of each pair members’ initial answer to a certain problem or question.

The ArgueGraph therefore features a particular mechanism to create adequate conditions for collaboration. As indicated before, it is possible to identify such mechanisms in the practice and extract from them good practices in structuring collaborative learning. These good practices can be captured as design patterns, such as Collaborative Learning Flow Patterns (CLFP) (Hernández-Leo, Villasclaras-Fernández, Asensio-Pérez, Dimitriadis, Jorrín-Abellán, et al., 2006), which make use of a similar format as that proposed originally by Alexander et al. (1977). CLFPs capture the basic structure of a script, which is organized with the aim of applying a particular pedagogical method that has shown to work under certain circumstances. Thus, CLFPs serve as documentation for designers in the creation of macro-scripts. The advantage of design patterns is that, through a common format, they communicate not only a validated structure of a macro-script, but other relevant information that the designer should be aware of: the context in which the pattern can be applied, the problem that the pattern attempts to solve, the form of the general solution, and guidelines about how to develop this general solution within a specific learning scenario (Alexander, 1979). Therefore, pedagogical design patterns, such as CLFPs, not only propose a learning technique, but also guide the designer in the decision of whether the pattern is suitable or not for a specific learning scenario. CLFPs have shown to facilitate the creation of collaborative learning scripts by non-expert designers (Hernández-Leo, Villasclaras-Fernández, Asensio-Pérez, Dimitriadis, Jorrén-Abellán, et al., 2006).

Other aspects of learning can also be tackled by the usage of design patterns. For instance, the configuration of other types of scripts, such as micro-scripts, could potentially benefit from the
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