

Chapter 15

Pedagogy–Based Technology Enhancement in Tertiary Education

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ABSTRACT

Formal instruction still occurs predominantly in classroom environment, despite the rapid progress in online learning. The authors present digital patterns for classroom instruction to support classroom learning and assist instruction developers. They advocate design patterns and learning activities to encapsulate digital educational resources into pedagogically sound reusable components. This chapter proposes pedagogical patterns to drive content providers to meet learner profiles in regular tertiary education environments. Taking their roots from behavioral learning discipline, these patterns are digitized as part of a separate process in learning production workflows. The authors describe the overall organization of a learning production enterprise and position the pedagogical factory to drive the supply of learning contents in increasingly digitized tertiary education institutions. This chapter reunites digital patterns to support personalization and conversational pedagogies in classroom contexts.

1. INTRODUCTION

Classrooms are increasingly expected to be student-centered to promote personalized learning processes and yet, develop communities of practice. The classroom experience should seize the conversational opportunities for the students to learn in collaboration as well as construct their own knowledge through personalized learning

models. We have already investigated the development of digital patterns to promote personalized learning in a previous research work (Atif, 2011) and also digital patterns to support collaborative learning in a classroom environment (Atif, 2013). In this chapter, we combine these two approaches to support both personalized and conversational learning methods in classroom contexts.

Learning Technology has been promoting the provision of learning content in self-contained Learning Objects (LO) (Wiley, 2000) (Sampson & Karampiperis, 2006). This effort led to significant

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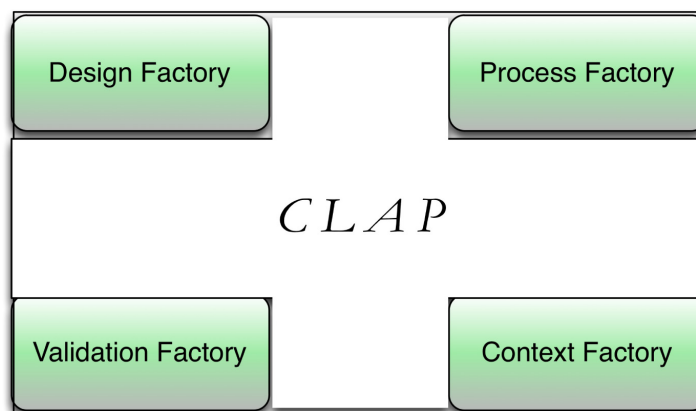
progress in reusability of learning resources (Blas, Gutiérrez, Marcos, & Barchino, 2009) (Hamel & Ryan-Jones, 2002). Learning however, is not just about contents but also about the process through which content is repurposed into personalized learning patterns (Verbert, Jovanović, Gašević, & Duval, 2005). Educationalists have previously distanced themselves from the prevailing of “one size fits all” principle in education and recommend agile learning processes (Dolog, Henze, Nejd, & Sintek, 2004), which map instructional contents into experiential learning activities. Yet, this external pedagogical know-how is not conveyed in a reusable manner to domain experts. Learners are driven by monotonic learning processes, which are remote from their preferred learning mode or not adequate for conveying some typical learning contents.

To empower passive learning components with process-oriented attitude, we have introduced reConfigurable Learning through Adaptive Patterns (CLAPs) (Atif, 2011). The purpose of CLAPs is to enable a given learning content to adapt to different learning configurations, which match various personal competencies and classroom profiles. Learning services are expressed as service-providing factory modules (Figure 1), where Learning Design, Process, Validation and Context Factories form an enterprise learning

framework (Wolpers & Grohmann, 2005). This semantic Web architecture for learning (Baldoni, Baroglio, Brunkhorst, & Marengo, 2007) (Panteleyev, Puzankov, Sazykin, & Sergeyev, 2002; Wang & Chen, 2008) supports both autonomous and collaborative learners in a tertiary education environment.

This model requires communication channels that permit self-organized interactions. To enable these channels, a technology-enhanced learning venue could facilitate coordinated and monitored learning spaces to integrate both personalized and conversational learning models (Atif, 2012). Classrooms are designed to meet current and future needs of the teachers and students who will use them, rather than simply replicating what was done in past classrooms or making compromises that have a negative implication the quality of the learning environment. When designing a classroom, a mix of education and technology discipline are considered to ensure that adequate attention is given to different types of instructional methods and learning environments. However, current classrooms are ill designed to support teachers deploying various instructional models and to support learners embracing various learning styles. Good classroom pedagogy practice recommends maximizing discussion while limiting “noise” to foster cooperation, collaboration, and knowledge

Figure 1. Learning factories in a tertiary education environment



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