Introducing Learning Performance in Personal Learning Environments

Laurent Moccozet,
Institute of Services Science
University of Geneva
Geneva, Switzerland
Laurent.Moccozet@unige.ch

Abstract— **A learning performance is the achievement of a learning activity. It includes two aspects: the result and the process. Until now, in Learning Environments, emphasis has been especially given to the result. We propose to integrate the learning performance process in the design of PLEs in order to foster self-regulated learning in PLE. We describe a simple paradigm that can be easily incorporated into existing PLE architectures in order to enhance the sharing of learning performance process between learners.**

Personal learning environment; virtual learning environment; self-directed learning; web 2.0; digital literacy

I. INTRODUCTION

Although a lot of attention has been recently devoted to Personal Learning Environments (PLEs), the definition of the concept and how it should be developed remains relatively open. It goes from broad conceptual definition such as: "Under the concept of the PLE we find everything (literally: everything) that a person is using to learn" [1] to more precise and concrete ones, such as: "PLEs are typically described as a collection of different ICT tools and software, usually social software, to foster self-regulated and collaborative learning" [2]. The interest for the PLE has been stimulated by the advent of Web 2.0 collaborative services with a high educational potential [3]. The concept of PLE is also closely related to digital or ICT literacy [4] [5]. Self-Regulated Learning (SRL) can be considered at two levels in PLE: learning to learn (acquiring digital skills) and learning itself. Reference [6] explores the most representative models of SRL with a socio-cognitive dimension and establishes the common features across models. More interestingly, the authors identify three core social components: feedback, modeling and scaffolding. They raise attention to the fact that "when students observe models, they acquire knowledge and strategies for successfully completing a task." A pedagogical framework is proposed in [7] to support SRL by scaffolding in web 2.0 and social media based PLEs. It takes into account 3 levels: 1) personal information management, 2) social interaction and collaboration, and 3) information aggregation and management. The authors note that "a PLE can be entirely controlled or adapted by a student according to his or her formal and informal learning needs, however not all students possess the knowledge management and the self-regulatory skills to effectively use social media in order to customize a PLE to provide the learning experience they desire." We consider a PLE as a learner-centric self-paced collaborative learning environment aimed at supporting the completion of learning activities and providing the necessary infrastructure to achieve the pedagogical framework described in [7]

II. LEARNING PERFORMANCE

To clarify the concept of learning performance, we rely here on the glossary proposed in [8]. In figure 1, we provide a concept map that concisely depicts how the main learning concepts and their relations are organized with respect to learning performance. To summarize the situation we can consider that learners are faced to learning activities that they are expected to achieve with the support of their PLE.
A learning activity may be composed of multiple learning tasks, and multiple learning activities can be organized to describe a learning scenario. A learning task itself is a coordinated series of operations to be performed to achieve a result. A learning activity is usually mobilizing available resources and producing new ones.

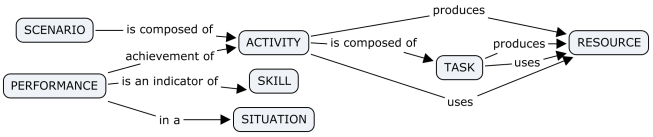

Figure 1. Learning performance overview

The learning performance can be defined as the achievement of a learning activity in a given situation. The learning performance is identified according to two criteria: the result ("what" has been produced) and the process ("how" it has been produced). The learning performance is directly related to skill and is an indicator to assess the acquisition of a skill. The current academic evaluation mainstream is still mainly focused on the result of the performance. In traditional other-regulated learning, the performance process is usually established, at least globally, once for all learners by the teacher. This is for example

instantiated with pre-defined learning paths in Virtual Learning Environments (VLEs) such a Dokeos or Moodle. The "how" is underrated in the evaluation process, focusing on the "what", which is in turn reflected in the design of Learning Environments (LEs). LEs can be globally sketched as platforms to use, reuse and produce the resources involved in a learning performance and the assessment of the performance result. This is also true for PLEs where the emphasis is even stronger on the organization and exploitation of resources in a self-paced manner.

We argue that supporting self-regulated learning in LEs requires a shift of mind where "how" the learning performance is achieved is equally important to "what" the learning performance has achieved. If the "how" is not currently explicitly expressed in PLEs, they most probably already record the data set necessary to document self-regulated learning performance. In the next section we describe how it is possible to integrate it into an existing PLE framework.

III. LEARNING PERFORMANCE IN A PLE

Documenting the learning performance process is a difficult task in itself, particularly if it has to be done by the learner itself. It also requires skills that not all learners have. However, our hypothesis is that the PLE includes all the required features to support and assist students to describe the performance process as they are executing it.

To illustrate our hypothesis, we describe how it can be implemented in a given model. The 3A interaction model proposed in [9], currently implemented as a PLE called "graasp" [10], is particularly suited for the design of PLEs based on social media and web 2.0. Moreover, it offers all the features required to support the 3 levels pedagogical framework described in [7]. The acronym of the model stands for three components interacting together: Actors, Activities and Assets. The whole framework is managed through actions that trigger events. We can devise a hybrid synchronous/asynchronous model for documenting the performance process, including automatic and interactive facets. It is possible to automatically record events related to a specific activity together with its timestamp. In addition, it is also possible to apply the available interactive features of the PLE to let the learner tag, edit and annotate the performance of the activity at any time of the process and later by itself. The performance process can be concretized as an asset associated to an activity and displayed as an interactive editable timeline. A timeline [11] is an intuitive data visualization model, particularly suited for displaying chronologically organized data sets such as the performance process. It then becomes a resource that can be integrated into the global SALT (Share, Assess, Link and Tag) [9] process. It completes and merges the two sides of the learning performance: result and process. It allows sharing performance processes among learners and achieving a recommendation from [6] stating that "coping models enhance self-efficacy and skills better than mastery models" and "observing multiple peer models is more effective."

IV. CONCLUSION

In this paper, we distinguish the learning performance from the learning activity. The learning performance provides two outputs: the result itself and the process to obtain this result. We further propose to support students for documenting and annotating their performance process with a hybrid method: synchronously during the process execution and asynchronously by editing it as a timeline. The performance process can then be integrated in the PLE and exploited as a resource that can be shared with peers. We have also described how the proposed approach can be integrated within an existing PLE design.

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