A Personalised Approach in Informal and Inquiry-based Learning

Alexander Mikroyannidis
Knowledge Media Institute, The Open University, Milton Keynes MK7 6AA, U.K.

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Abstract: Personalised learning has emerged as a novel approach to learning, putting learners in the spotlight and providing them with the tools for building their own learning environments according to their learning needs and aspirations. Personalised learning is closely connected to self-regulated learning, which enables learners to take complete control over their learning. This paper presents the strategies involved with the application of personalised learning in two different case studies. These case studies originate from two European research projects and concern informal and inquiry-based learning respectively.

1 INTRODUCTION

Personal Learning Environments (PLEs) are gradually gaining ground over traditional Learning Management Systems (LMS) by facilitating the lone or collaborative study of user-chosen blends of content and courses from heterogeneous sources, including Open Educational Resources (OER).

The implementation of PLEs for supporting different types of learners involves a number of challenges. This paper presents two distinct case studies where personalised learning has either been applied or is currently being applied. The first case study has to do with informal learning in the context of the European project ROLE. The second case study builds on the lessons learned from the first case study and is concerned with inquiry-based learning in the context of the new European project weSPOT.

The remainder of this paper is organised as follows: Section 2 describes the background and introduces the main concepts related to personalised and self-regulated learning. Section 3 presents the informal learning case study of the ROLE project and discusses the methodology adopted for personalised learning in this case. Section 4 introduces the inquiry-based learning case study of the weSPOT project and describes the strategy for deploying personalised learning in this context. Finally, the paper is concluded in section 5 and the next steps of this work are outlined.

2 BACKGROUND

The Learning Management System (LMS) has dominated Technology-Enhanced Learning (TEL) for several years. It has been widely used by academic institutions for delivering their distance learning programmes, as well as for supporting their students outside the classroom. The LMS has been a powerful tool in the hands of educators, enabling them to complement face-to-face teaching in the classroom with remote work by individual students, as well as groups of them. Popular examples of such systems used by the academic and the business world include Blackboard (www.blackboard.com), Moodle (http://moodle.org), and Sakai (http://sakaiproject.org) (Bri et al., 2009; Wainwright et al., 2007; Abel, 2006; Watson et al., 2007).

However, the advent of Web 2.0 has altered the landscape in TEL. Learners nowadays have access to a variety of learning tools and services on the web. These tools and services are usually provided by different vendors and in many cases are open and free. Repositories like Wikipedia (www.wikipedia.org), YouTube (www.youtube.com), SlideShare (www.slideshare.net) and iTunes U (www.apple.com/education/itunes-u) offer access to a wide range of learning materials for free. Augmenting and configuring the diverse and distributed Web 2.0 tools and services in order to address the needs and preferences of individual

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learners is a significant challenge for modern online learning environments.

As opposed to formal learning, which is mostly instructor-led, informal learning is driven by self-study and the initiative of individuals, as well as communities of learners with common goals. The transition from the traditional approach of LMS to Web 2.0-based learning solutions bears significant benefits for informal learners. It puts emphasis to their needs and preferences, providing them with a wider choice of learning resources to choose from. In addition, the success of initiatives such as the Khan Academy (www.khanacademy.org) has proven the importance of Web 2.0-enabled crowdsourcing in informal learning.

The Personal Learning Environment (PLE) is a facility for an individual to access, aggregate, manipulate and share digital artefacts of their ongoing learning experiences. The PLE follows a learner-centric approach, allowing the use of lightweight services and tools that belong to and are controlled by individual learners. Rather than integrating different services into a centralised system, the PLE provides learners with a variety of services and hands over control to them to select and use these services the way they deem fit (Chatti et al., 2007; Fiedler and Väljataga, 2010; Wilson, 2008).

The emergence of the PLE has greatly facilitated the use and sharing of open and reusable learning resources online. Learners can access, download, remix, and republish a wide variety of learning materials through open services provided on the cloud. Open Educational Resources (OER) can be described as "teaching, learning and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or repurposing by others depending on which Creative Commons license is used" (Atkins et al., 2007).

Self-regulated learning (SRL) comprises an essential aspect of the PLE, as it enables learners to become "metacognitively, motivationally, and behaviourally active participants in their own learning process" (Zimmerman, 1989). Although the psycho-pedagogical theories around SRL predate very much the advent of the PLE, SRL is a core characteristic of the latter. SRL is enabled within the PLE through the assembly of independent resources in a way that fulfils a specific learning goal. By following this paradigm, the PLE allows learners to regulate their own learning, thus greatly enhancing their learning

3 AN INFORMAL LEARNING CASE STUDY

The European project ROLE (Responsive Open Learning Environments; www.role-project.eu) is aiming at empowering learners for lifelong and personalised learning within a responsive open learning environment. In order to study and evaluate the applications of PLEs in a variety of learning contexts, the ROLE project has setup a number of test-beds. The Open University (OU), UK comprises one of the ROLE test-beds, concerning the learners' potential transition from formal to informal learning. This transition is being implemented within this test-bed as a transition from the traditional LMS towards the PLE paradigm (Mikroyannidis, 2011; Mikroyannidis and Connolly, 2012a; Mikroyannidis and Connolly, 2012b).

The test-bed in question is the OER repository OpenLearn offered by the OU. OpenLearn (http://openlearn.open.ac.uk) currently offers more than 6,000 hours of study materials in a variety of formats. These include materials repurposed as OER from original OU courses i.e. formal delivery as well as bespoke OER created by both OpenLearn academics and non-OU educators, i.e. enabling informal delivery.

OpenLearn users are primarily informal learners, who want to find and study OER either individually or in collaboration with others. These learners can be in formal education e.g. taking an accredited University course elsewhere and simply looking for additional materials to add value to their primary course or they maybe, what is often described as, "leisure" learners i.e. those who simply want to learn for themselves with no expectation of formal accreditation.

OpenLearn currently uses Moodle as a LMS platform. Therefore, in order to add value to those potential learning experiences, this test-bed has endeavoured to raise awareness of PLEs and SRL with the community of informal learners that are actively using OpenLearn for their learning. This has been done primarily through the production of bespoke OER as OpenLearn courses that raise awareness about ROLE and its approach in personalised and self-regulated learning (see http://tinyurl.com/role-course and http://tinyurl.com/role-srl-course for more details). Figure 1 shows a sample learning activity from these courses. The learning activity in question introduces learners to the use of a widget for finding learning resources.

This transition attempts to transform and improve the OpenLearn user's experience by enabling individuals to build and personalise their learning environment, thus gaining more control over their learning process through the use and manipulation of OER study materials. The aforementioned bespoke OER that have been developed by the ROLE project also provide guidance on how someone can use a PLE in order to better organise their learning and improve their SRL skills.

In addition, the adoption of certain ROLE widgets inside study units of the OpenLearn platform is offering further value to informal learners by supporting a stronger framework to foster learning communities. This presents an opportunity to individual informal learners to be part of a shared learning experience instead of a lone study.

Figure 1: A learning activity featuring a ROLE widget inside an OpenLearn course.

4 AN INQUIRY-BASED LEARNING CASE STUDY

weSPOT (Working Environment with Social, Personal and Open Technologies for Inquiry Based Learning; http://wespot-project.eu) is a new European project, aiming at propagating scientific inquiry as the approach for science learning and teaching in combination with today's curricula and teaching practices. weSPOT aspires to lower the threshold for linking everyday life with science teaching in schools by technology. weSPOT supports the meaningful contextualization of scientific concepts by relating them to personal curiosity, experiences and reasoning.

weSPOT addresses several challenges in the area of science learning and technology support for building personal conceptual knowledge. The project focuses on inquiry-based learning with a theoretically sound and technology supported personal inquiry approach. In inquiry based-learning, learners take the role of an explorer and scientist and are motivated by their personal curiosity, guided by self-reflection, and develop knowledge personal and collaborative sense-making and reasoning.

As we have learned from the ROLE project, what is often missing from the PLE, is not the abundance of tools and services, but the means for binding them together in a meaningful way. weSPOT will address this issue by providing ways for the integration of data originating from different inquiry tools and services. Most importantly though, weSPOT will enable the cognitive integration of inquiry tools by connecting them with the students' profiles, as well as their social and curricular context. Individual and collaborative student actions taking place within different inquiry tools will update the learning history and learning goals of the student, thus providing them with a cohesive environment for monitoring and self-regulating their learning process and progress.

The Web 2.0 paradigm offers new opportunities for social learning by facilitating interactions with other learners and building a sense of connection that can foster trust and affirmation (Weller, 2009). Social learning, according to Hagel, et al. (Hagel et al., 2010), is dictated by recent shifts in education, which have altered the ways we catalyze learning and innovation. Key ingredients in this evolving landscape are the quality of interpersonal relationships, discourse, personal motivation, as well as tacit over explicit knowledge. Social media offer a variety of collaborative resources and facilities, which can complement and enrich the individual's personal learning space, as shown in Figure 2.

weSPOT will provide students with the ability to build their own inquiry-based learning environment, enriched with social and collaborative features. This will allow them to filter inquiry resources and tools according to their own needs and preferences. Students will be able to self-regulate their inquiry-based learning process by planning, organising and executing it in collaboration with their peers. Students will also be able interact with their peers in

order to reflect on their inquiry process, receive and provide feedback, mentor each other, thus forming meaningful social connections that will help and motivate them in their learning. From a learner's perspective, this approach will offer them access to personalized bundles of inquiry resources augmented with social media, which they will be able to manage and control from within their personal learning space.

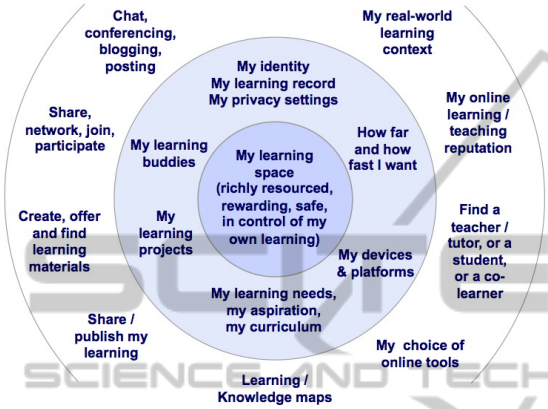

Figure 2: Personal learning space, resources, and social interactions (Shum and Ferguson, 2010).

5 CONCLUSIONS

Personalised and self-regulated learning is offering new capabilities to learners, by allowing them to build and use learning environments that meet their particular learning needs, thus taking control over their learning journey. This paper presented the premises of applying personalised learning in two distinct case studies, concerning informal and inquiry-based learning respectively.

The lessons learned from the informal learning case study of the ROLE project have provided us with an insight into some of the challenges associated with the deployment of PLEs for supporting informal learners in the context of using and manipulating OER. Building on these lessons, we plan to proceed with the deployment of PLEs in the inquiry-based learning context of the weSPOT project, in order to further explore the challenges and opportunities of personalised and self-regulated learning. The overall lessons learned from investigating these two different case studies and learning contexts will enable us to formulate a set of best practices regarding the successful implementation and deployment of PLEs for supporting SRL both in informal and formal education settings.

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