Personalised learning spaces and self-regulated learning: Global examples of effective pedagogy

Catherine McLoughlin
School of Education (ACT)
Australian Catholic University
Mark J.W. Lee
School of Education
Charles Sturt University

Recent educational research attests to an increasing awareness of the need to encourage learner control over the entire learning process. Web 2.0 and social software tools are capable of supporting informal conversation, dialogue and collaborative content generation, enabling access to a wide raft of ideas and representations. Used appropriately, they can shift control to the learner by promoting agency, autonomy and engagement in social networks that straddle multiple real and virtual learning spaces independent of physical, geographic, institutional and organisational boundaries. However, in order for self-regulated learning to come to fruition, students need not only to be able to choose and personalise what tools and content are available, but also to have access to appropriate scaffolding to support their learning. Emerging practices with social software, examples of which are showcased in this paper, signal the need for pedagogies that are more social, personal and participatory. The paper concludes with a discussion of the implications for practice, including current challenges faced by tertiary educators.

Keywords: personalisation, PLE, self-directed learning, social software, scaffolding, support

The trend towards self-directed learning environments

The uptake of digital communication tools and ubiquitous networked applications, along with the changing demands of students, is shaping the global learning landscape of the twenty-first century. The UK-based Committee of Inquiry into the Changing Learner Experience (CLEX, 2009) concludes that "Web 2.0 … has had a profound effect on behaviours, particularly those of young people whose medium and metier it is. They inhabit it with ease and it has led them to a strong sense of communities of interest linked in their own web spaces, and to a disposition to share and participate" (p. 9). Digital-age students want an active learning experience that is social, participatory and supported by rich media. Current research also points to a growing appreciation of the need to support and encourage learner control over the whole learning process (Dron, 2007). As web-based multimedia production and distribution tools incorporating rich audio (podcasting, Skype), photo (Flickr) and video (vodcasting, YouTube) capabilities continue to grow, tertiary education institutions are faced with ever-expanding opportunities to integrate social media and technologies into teaching, learning and assessment. These technologies are capable of supporting and encouraging informal conversation, dialogue, collaborative content generation and the sharing of knowledge, thereby facilitating access to a vast array of ideas and representations. They afford greater learner agency by allowing autonomy and engagement in global communities where ideas are exchanged and knowledge is created as students assume active roles (Lee, McLoughlin & Chan, 2008).

The learning experiences enabled by social software tools are active, process based, anchored in and driven by learners' interests, and therefore have the potential to foster self-regulated learning, which refers to the ability of a learner to prepare for his/her own learning, take the necessary steps to learn, manage and evaluate his/her learning and provide self feedback and judgement, all while maintaining a high level of motivation (Zimmerman & Schunk, 1989; Simons 1992). The quest for learning to be self-

directed and self-regulated has been a pursuit of educators for many decades, and recent reports from the UK and USA (Minocha, 2009; NMC, 2009) indicate that the integration of social software into learning design can make a qualitative difference to giving students a sense of ownership and control over their own learning and career planning. However, universities still tend to rely on conservative, established course management systems (CMSs) that do not fully capitalise on the potential of social media that enable participation in global learning networks, collaboration and social networking. Recently, the Personal Learning Environment (PLE) has emerged as a concept associated with the adoption of a raft of Web 2.0 tools that serves to integrate essential learning outcomes such as lifelong, informal and self-directed learning. Attwell (2006a) claims PLEs offer a means to "respond to the way people are using technology for learning and … [allow] them to … shape their own learning spaces, to form and join communities and to create, consume, remix, and share material".

In this paper, we consider issues in the design of personalised learning spaces, resources and environments using social software and media, and how they might be used to achieve learner-self direction. Of crucial importance to attaining the longstanding goal of student-centred learning is the need to acknowledge the importance of including informal modes of learning in the learning experience, to realise that learner needs and preferences cannot be addressed as static constructs during the design and development phases of instructional design, and to provide suitable scaffolds to support the learning outcomes to be attained. Educators need to revisit socially-based, conversationally-driven designs for self-directed learning and be prepared to accept and face the reality that learners' needs, preferences, perceptions and mental models will contribute significantly to the dynamic learning design process. This implies that pedagogic change and greater personalisation of learning are both necessary for student-centred, self-regulated and independent learning.

Personalised learning and PLEs

Although many CMSs adopted by institutions allow each student to have a personal view of the courses they are enrolled in, many do not accommodate the social connectivity tools and personal profile spaces that students might choose, and which would assist them to integrate their experiences. CMSs tend to replicate traditional teaching models in online environments, conforming to a classroom or lecture hall metaphor that may impede the realisation of self-directed and self-regulated learning, as learning tasks are pre-selected and resources are prescribed rather than negotiated. Green, Facer, Rudd, Dillon and Humphreys (2006) summarise four key areas pivotal to enabling personalised learning through digital technologies. According to them, pedagogy must:

- ensure that learners are capable of making informed educational decisions;
- diversify and recognise different forms of skills and knowledge;
- create diverse learning environments;
- include learner-focused forms of feedback and assessment.

Linked to these principles is the concept of the PLE, defined by Siemens (2007b) as "a collection of tools, brought together under the conceptual notion of openness, interoperability and learner control … PLEs are comprised of … the tools and the conceptual notions that drive how and why we select individual parts" (para. 2). Downes (2005) asserts that PLEs affirm the role of the individual in organising, customising and shaping the learning environment. With PLEs, in contrast to the traditional approach whereby learning content is composed, organised and packaged, it is instead syndicated. From there, it is re-mixed and re-purposed ('mashed up') with the student's own individual application in mind, the finished product being further syndicated to form inputs for other students' use. Rather than being an agreed-on concept, there are, however, two quite different interpretations of PLEs: The first entails the understanding of personalisation as the need to create a learner-centred but provider-driven approach to education; the second adopts the view of a wholly learner-driven approach. The idea is for learners to exercise ownership and control over their learning experiences, rather than be constrained by centralised, instructor-controlled learning based on the delivery of pre-packaged materials.

Both PLE models challenge tertiary teachers to harness the many resources that exist outside the formal spaces of the institution, to create opportunities for authentic learning that is personally meaningful and relevant to learners, and to capitalise on the interests and digital competencies that learners already possess. Unlike institutionally-controlled, content-centric CMSs, PLEs are learner-centric, providing contextually appropriate toolsets by enabling individuals to adjust, select, integrate and use various software, services and options based on their needs and circumstances, ideally resulting in a model where learner needs, not technologies, drive the learning process (Attwell, 2006b, 2007). Nevertheless, both PLE models allow learners to make decisions about how to choose tools and configure the learning

environment to best suit their goals and needs for networking, knowledge construction, social interaction and collaboration. In addition, both challenge traditional pedagogies where the teacher is the celebrated expert, dispensing knowledge and prescribing learning resources and content.

Rethinking pedagogy

Educators and institutions are increasingly recognising that the philosophy and ethos of Web 2.0 are highly incongruent with the control culture of education, where pre-packaged content and teacher-designed syllabi dominate. In a Web 2.0 world and given that a major goal of teriary education today is to prepare students for work and life in the knowledge economy and networked society, there is a need to move towards a social and participatory pedagogy rather than one based on the acquisition of facts. Along with the uptake of mobile devices and the growth of social media, tertiary student profiles indicate that most students now juggle work and study, expect constant Internet connectivity and web-based services, and view social networking tools as central to their academic and social lives (Windham, 2005). Conole and Creanor (2007) report that students "have high expectations of how they should learn, selecting the technologies and learning environments that best meet their needs with a sophisticated understanding of how to manipulate these to their advantage" (p. 11). As Web 2.0 is participatory and collaborative, enabling connection globally with multiple social worlds, there is a widening gap between the formalised interactions that occur in educational establishments and the modes of learning, socialisation and communication that youth experience and engage in. Siemens (2007a) states: "… our institutions need to change because of the increasing complexity of society and globalization. … [They] play a dual role: accommodating learner's method and mode of learning [sic] *and* transforming learners and preparing them to function in the world that is unfolding" (para. 6, author's emphasis). In a world characterised by social mobility and diversification of life trajectories, where individuals have multiple career paths and engage in reskilling at various stages, we must rethink pedagogy so that learners become active participants and co-producers of learning resources rather than passive consumers of content, and so that learning processes are participatory and social, supportive of personal life goals and needs.

Boettcher (2006) contends there is a need to re-evaluate the role of content in courses and advocates a greater focus on process and personal skill development. As the value of textbooks is being questioned and the open source and open content movements are gaining momentum, we are witnessing the rise of content that is produced by learners themselves, a further indication of personal choice and learner autonomy. One exemplary approach of a provider-driven PLE is the work of Aviram, Ronen, Somekh, Winer and Sarid (2008), who describe the design and implementation of *iClass,* an innovative "Self-Regulated Personalised Learning Environment" (SRPLE). iClass is intended to cater to individual learning needs by adapting education and learning in European societies to the challenges of the 21st century. The system runs an Internet platform and takes learners through three stages: planning, learning and reflection, with teachers acting as mentors at each stage. Aviram et al. oppose the rigid divides between formal/structured learning and informal/open learning; between school learning and lifelong learning, and even higher education; between learning and human development (i.e. education); and between formal learning and solving authentic, real-life problems. They maintain that these issues should be addressed in the framework of revised pedagogical thinking that combines personalised learning with self-regulated learning (hence self-regulated personalised learning, SRPL), enabling learner-created content. SRPL also includes the provision of adaptable and flexible learner and task scaffolding.

In attempting to achieve learner self-regulation, the sole use of open-ended or discovery learning environments in the absence of appropriate instructional support and task scaffolding has been criticised by a number of educational researchers (see, for example, Mayer, 2004). Moreover, though web-based learning environments lend themselves to self-regulated learning approaches (eg. inquiry-based and problem-based learning), new tasks and concepts impose numerous demands on learners (Narciss, Proske & Koerndle, 2007). As a counterbalance, personalised, learner-centred design offers a dynamic perspective that incorporates pedagogical scaffolds to support novice learners to learn and apply previously unknown thinking strategies, skills and practices (Aleven, Stahl, Scvhworm, Fischer & Wallace, 2003). Scaffolding need not be teacher directed, and current social software tools can be used in ways that address learner-centred concerns for self-managed learning and control (eg. e-portfolios). The challenge for educators, therefore, is to enable self-direction, knowledge building and autonomy by providing options and choice while still supplying the necessary structure and scaffolding. There are a growing number of designs for tasks and learning environments that seek to achieve balance between self-regulated, personalised learning and scaffolding/support through the use of Web 2.0 and social software tools. Table 1 below provides some examples, drawn from the practices of tertiary teachers across the globe.

Personalisation and task design in self-regulated online learning

While the international examples in Table 1 provide good working models of self-regulated and personalised learning, educators need guidelines that can be applied in diverse contexts. How can the 'ideal' balance between scaffolded and learner-directed activities and tasks be achieved? What role should technologies play in the process? Jonassen (1994) maintains that the real challenge facing educational technologists is to consider instructional goals in a particular context, then to adjust the strategies, models and tactics to attune the nature of the task to the perspective of the student. Driver, Asoko, Leach, Mortimer and Scott (1994) concur, adding that teachers have two roles: Firstly, a *supportive* role in introducing new ideas or cultural tools and supporting students in making sense of these for themselves, and secondly, a *diagnostic* role in continually examining students' interpretations of activities in order to help determine an appropriate direction for subsequent steps. Thus a major role of the teacher is arguably to facilitate this dynamic learning process, assisting learners in drawing their own links between their learning and the 'real world'; other roles may be that of consultant, guide and resource provider (Markel, 1999). A number of researchers have already begun to propose various tools, techniques and approaches to support the active involvement of both teachers and students in the design of learning tasks and environments (see for example, Ronteltap, Goodyear & Bartoluzzi, 2004; Goodyear, de Laat & Lally, 2006; McAndrew, Goodyear & Dalziel, 2006); new instructional and learning design practices are emerging that are based on the idea of student ownership of tasks, and that emphasise the importance of allowing flexibility, encouraging self-direction and choice as well as promoting creativity in the performance of tasks.

Table 1: International examples of how self-regulated and personalised learning can be facilitated using social software tools, while supplying the necessary scaffolding/support

Location	Author/ date	Context	Self-regulated learning and scaffolding/support	Personalisation
Victoria University of Wellington, New Zealand	Elgort, Smith & Toland (2008)	A mixture of on-campus and distance education students undertaking a Master of Library and Information Studies work in groups to collaboratively produce web-based information resource guides using a wiki.	Each group works autonomously to produce three deliverables, based on instructor-supplied guidelines: the resource guide (a web site providing links to / evaluations of resources); presentation of the guide to the class; and an online journal in which students document their work processes and reflect on their personal contribution to the project.	Each group of students chooses a topic that is personally meaningful, relevant and/or interesting to its members. The students also have flexibility in terms of their ability to personalise the content and the way it is presented using a range of digital media types.
Fashion Institute of Technology, USA	Harris (2007a, 2007b)	Students studying an art history class visit the Metropolitan Museum of Art in New York, where they take photos of exhibits using mobile phones, upload them to Flickr, and use the site's tools to tag, annotate and write descriptions and comments about the photos.	Students engage in learning tasks with a high degree of autonomy and freedom, as they mix and match content and create games and challenges for one another. Task scaffolding is provided by the instructor by using technology to enable expression of multiple perspectives and by mediating peer interaction.	Task personalisation ensures that students remain motivated, as they have a voice in making commentaries and choosing descriptors to tag photos. Peer-to-peer content sharing adds a collaborative dimension while allowing individual reflection and achievement.
Open University, Hong Kong	Lui, Choy, Cheung & Li (2006)	Students studying a year-long Software Engineering and Project Management course are required to write reflective blog entries in response to stimulus questions. Blogs are used as knowledge sharing and personal work/information spaces.	Learners are free to express ideas and engage in reflective processes on an individual basis, combining both independent work and peer feedback, thus ensuring independent learning and collaborative interaction. Scaffolds take the form of structured tasks plus formative peer and tutor evaluation.	Students work at their own pace and express ideas in their own style through blogs and wikis. The creation of e-portfolios documents each student's personal learning achievement and thereby supports personalisation.
University of Leicester, UK	Edirisingha, Salmon & Forthergill (2007)	Undergraduate engineering students use *profcasts*, audio material designed to support learning distinct from that facilitated through structured on-campus or e-learning processes alone.	Students learn independently by choosing profcasts that are relevant to their needs. Scaffolds include resources created by the instructor, and contexts where students can apply new knowledge.	The learning content is personalised by enabling students to choose when, where and how to make use of these enrichment resources.
Queensland University of Technology, Australia	English & Duncan-Howell (2008)	Pre-service teacher education students use the social networking tool Facebook during their teaching practicum placements to facilitate mutual support, encouragement and the sharing of stories/anecdotes.	Self-directed learning is encouraged by enabling students to create, share and comment on others' contributions, and by allowing them to choose from multiple forms of support. Scaffolding is provided by peers as they guide/assist one another, share digital artefacts and exchange constructive feedback.	Personal choices are exercised by encouraging expression of and reflection on individual learning journeys.

Moving towards the personalisation of learning environments also entails providing learners with the fundamental skills that enable them to manage their own learning. Recent editions of the *Horizon report* (eg. NMC, 2009) stress that a critical challenge is to design learning experiences that scaffold the development of key competencies, including visual, technological and information literacy and the 'soft' skills of communication and teamwork. In the digital age, the range of scaffolds is varied and complex and the learner must play an active role in negotiating the types of contextual, social and task support needed. The meaning of scaffolding is no longer confined to its original association of expertise provided by a knowledgeable other (Wood, Bruner & Ross, 1976), but has expanded to include learner-selected

assistance, peer interactions, or could be embedded in technology. The above having been said, despite the abundance of good practice examples there continue to be significant gaps in teachers' espoused and enacted pedagogies. In the Web 2.0 era, the need to close these gaps to achieve truly student-centred learning is paramount, as learners, more so than ever before, desire autonomy, connectivity and socio-experiential learning (McLoughlin & Lee, 2008). Fortunately, Web 2.0 also equips educators with a repertoire of services and applications to address this challenge by enabling learner choice and allowing creative decisions about how to best set learning goals and create learning environments that support those goals. The essential difference in the role of the institution is a move from delivery of content to a focus on designing for learning, where the student's voice and needs shape decision-making.

Conclusion: Implications for practice

In this paper we have argued for personalised learning spaces, resources and environments to be developed, supported and created through systematic design and by inclusion of both instructor and learner perspectives, as well as the integration of Web 2.0 tools. As online or Internet-based learning is now the mode of learning for many students globally, there is an often an expectation that students commence tertiary study with reasonably high levels of digital skills to enable them to negotiate, interact and access resources independently (Lorenzo & Dziuban, 2006; Katz & Macklin, 2007). Also, as noted in many recent reports, the dispositions developed through engagement with Web 2.0 and social software technologies – i.e. communication skills, participation, networking, sharing – overlap with what are viewed as essential 21st-century learning skills and employability skills (Punie & Cabrera, 2006; Jenkins, 2007; CLEX, 2009). Nonetheless we have made a case for stronger and more systematic scaffolding of essential skills and digital literacies as students may not have advanced knowledge of how to use the technology for academic purposes, and may not see the relevance of social media for learning. In fact, their day-to-day use of ICTs may have cultivated in them impatience and a desire for instant answers, as well as leading them to adopt a casual approach to critical evaluation, plagiarism and information ownership (CLEX, 2009). For higher education institutions in many countries, the development of digital literacies and independent learning is now high on the agenda. Universities and colleges are being advised to adopt both the infrastructure and curriculum changes to maximise the potential of the new tools to support learning by capitalising on the competencies and skills students already possess, while at the same time equipping students with the attributes and capabilities needed in the digital economy and networked society.

The challenges for educators are complex and multifaceted, and include the provision of personalised learning experiences using suitable technologies that cultivate independent learning skills, while also scaffolding learner reflection and the development of generic competencies. The pedagogical change required involves not only the adoption of appropriate teaching methods, but also awareness of the learner experience, and the need to value learners' pre-existing skills and capitalise on them, while exploring and integrating social media that allow participation, community connections, social interaction and global networking. At the same time, teachers who adopt social software tools should not do so merely to appear conversant with the tools, but to ensure integration of the tools with sound pedagogical strategies so as to facilitate authentic exchange and dialogue with and amongst students. They must be wary of potential privacy and security issues involved in the use of Web 2.0 tools, not to mention that they may feel unwelcome in their students' online social networks and communities. All in all, addressing the need to rethink and reposition pedagogy for the new learning landscape calls for the active involvement of students in defining their learning goals and choosing both ICT tools and strategies for learning; it also requires recognition that user or learner-generated content has a central place in a curriculum that fosters self-regulated learning. There is a fine balance to be achieved in promoting learner control, knowledge creation, agency and autonomy by offering flexible options and choice, while making guidance and structure available when needed and adding value to the learning process through personalised approaches.

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Authors: Catherine McLoughlin, School of Education (ACT), Australian Catholic University, PO Box 256, Dickson, ACT 2602, Australia. Email: catherine.mcloughlin@acu.edu.au

Mark J.W. Lee, School of Education, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia. Email: malee@csu.edu.au

Please cite as: McLoughlin, C. & Lee, M.J.W. (2009). Personalised learning spaces and self-regulated learning: Global examples of effective pedagogy. In *Same places, different spaces. Proceedings ascilite Auckland 2009.* https://doi.org/10.14742/apubs.2009.2268