Integrating learning management and social networking systems

Integrare i Learning Management System con i social network

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ABSTRACT Learning Management Systems (LMS) have become ubiquitous tools in support of both classroom and distance education programming. They bring significant advantages that digitize and automate many of the functions and pedagogical activities of traditional campus teaching. At the same time social networks have become ubiquitous tools for communication, entertainment and informal learning by both students and teachers. In this article we examine the characteristics, strengths and limitations of both toolsets and the ways in which innovative distance educators are attempting to merge the best qualities of each. We conclude with a case study of one such integration from Athabasca University in Canada.

KEYWORDS Learning Management Systems (LMS), Social networks, Online education, Distance education.

SOMMARIO I Learning Management System (LMS) sono diventati strumenti ormai ubiquitari di supporto alla didattica sia in classe che nell'educazione a distanza. Apportano vantaggi significativi nel digitalizzare e automatizzare molte delle funzioni e delle attività pedagogiche nell'ambito dell'insegnamento universitario tradizionale. Allo stesso tempo, anche i social network sono diventati strumenti capillarmente diffusi per la comunicazione, l'intrattenimento e l'apprendimento informale sia tra gli studenti che tra gli insegnanti. In questo articolo esaminiamo le caratteristiche, i punti di forza e le limitazioni di entrambi i servizi e i modi in cui insegnanti a distanza innovatori stanno cercando di unire le qualità migliori di ciascuno. Concludiamo con un caso di studio di questa integrazione realizzato in Canada all'Athabasca University.

PAROLE CHIAVE Learning Management Systems (LMS), Social network, Educazione online, Educazione a distanza.

1. INTRODUCTION

The Learning Management System (or Managed Learning Environment as it is known in some countries) has become a ubiquitous toolset in higher education. One can conclude from a considerable number of studies globally that LMS systems are generally appreciated and used by large numbers of teachers (but

certainly not all teachers even when they are available and well supported, Dahlstrom, Brooks, & Bichsel, 2014; Walker, Lindner, Murphrey, & Dooley, 2016). Further, they play an important role as a support and driver for many campus-based education systems' first entry into online and blended learning and teaching. However, we argue that the LMS may be just a beginners' limited entry point into the greater opportunities afforded by online teaching and learning.

A large 2014 study in the United Sates revealed 99% of educational institutions support at least one LMS. Despite this high availability, this ECAR study (Dahlstrom et al., 2014) found that, although the majority of US faculty use the LMS (74%) and find the LMS useful for teaching (71%), relatively few use any of the advanced features beyond content sharing, announcements and coursework submission and management. Notably, little use is made of the variety of tools available within most LMSs for student-faculty interaction. A 2015 study from sub-Sahara Africa (Joel, 2015) found that LMS systems were installed in the majority of higher education institutions but concluded that «*the majority of adopted LMS are underutilized* […] *The evidence from this study suggests that these benefits will not be achieved if institutions cannot find strategies that can increase usage of educational technologies in their institutions*» (p. 58).

For those of us working in distance education institutions or developing and delivering courses or programs entirely online, this reliance on classroom interaction to support the social components of teaching and learning is, of course, not possible. Thus, the interest and challenge explored in this paper is of developing enhanced contexts for supporting not only content distribution but social group, network and set interactions for distance teachers and students. Beyond that, we seek to explore some of the avenues that are opened up once we throw off the constraints of a system that is both based upon and designed to work within a physical institution. Given that the LMS is typically made to work within a campus-based institution, it is not surprising that it provides relatively weak support for such distance education needs and yet, for many distance institutions, it has become a surrogate classroom.

The paper first looks at the context, features and sociology of both LMS and social networking systems. It then presents ways in which institutions and researchers have created links to integrate the systems. It finally focuses on a brief case study of the development and use of a social networking system at a Canadian distance education university.

2. LEARNING MANAGEMENT SYSTEMS

The LMS consists of a bundle of tools that are made available to teachers and, importantly, a structure into which they can fit many of their current teaching activities and processes. These include content sharing, interaction, calendar, enrolment, collaboration and assessment capabilities. Although each (of many) suppliers proclaim the superiority of their product in the marketplace, the tools and even the user interfaces supplied in the LMS are markedly similar amongst both open source and proprietary companies.

Both the successes and the limitations of LMS use are associated with the capacity of these systems to support many of the existing models and pedagogy of higher education systems (Anderson & Dron, 2012). The most popular tools of the LMS are content dissemination and assignment and grade management (Phillips, 2006). Most LMS use is by campus-based institutions where face-to-face interaction is the norm. Like all technologies, LMSs are part of a further assembly and, in campus-based institutions, they are relatively minor components of a much larger machine. It is reasonable in such a context to take advantage of already well-embedded physical alternatives that appear to fulfill a similar purpose, and that are likely already embedded in the timetable as well as being so familiar that they do not feel like technologies any more. The design of most LMSs explicitly or implicitly mirrors that of physical institutional structures and mechanisms so, unless they were to offer some very notable benefits, the costs, complexity and risks of using them mean

that most teachers wisely choose the original rather than the innovation. There are some occasions where the duplicated functionality within the LMS can lead to pedagogical innovation, such as through flipped classrooms (Strayer, 2007), where content is delivered and received through the LMS, leaving classrooms as spaces where active and social learning can thrive. On the whole, however, within a campus-based institution, the extra value of the LMS is perceived to mainly lie in its capacity to increase efficiency and improve what is already done. The most obvious of these uses is as a central repository that reduces the complexity of handing out materials and sending announcements at short notice to a whole class. The LMS offers advantage through its ability to automate processes (especially assessment management) and, also, but to a far lesser extent, the transition from synchronous classroom to asynchronous text discussions and presentations: thus new pedagogies are possible for those that feel they are needed. Moreover, the LMS provides an easy transition – not requiring significant pedagogical change when moving from campus-based to online distance education.

Although largely based upon the model of teaching and learning that has changed little since medieval times, the possibilities opened up by digitization have led to some new functionalities. For instance, most LMSs have long supported some form of adaptive release of content, typically based on prior navigation or quiz answers, as well as other forms of automated content showing and hiding, such as by date. More advanced systems develop student models to personalize content deployment (Muñoz, Lasheras, Capel, Cantabella, & Caballero, 2015). Newer developments in LMS systems include analytics tools that allow teachers to assess both the majority and outlying performances of their classes (Macfadyen & Dawson, 2010) and these results can be displayed on visual dashboards for teacher and sometimes student review (Verbert, Duval, Klerkx, Govaerts, & Santos, 2013). These analytic systems are also being integrated at the department or institutional level to allow student tracking and management as well as curriculum mapping across courses. Though such tools appear to offer new features that were not obviously available in traditional classrooms, it is notable that such technologies automate very traditional teacher roles, replacing teachers' observations and judgments on how things are going in a classroom, where to go next and how to adapt to different learner needs, with algorithms that serve an identical function (arguably less well, depending on the skill and available attention of the teacher). We may thus see the LMS as a set of components built to partially automate, partially support and partially replicate the traditional roles of a classroom-based teacher (Mott, 2010).

All major LMSs are role-based systems that embed, deliberately or otherwise, the roles and hierarchies of their institutions and, more often than not, the norms and methods that result from that. In most institutions the LMS is most easily perceived as a teacher-created and controlled system but, though it may seem that way to students, this is not the whole story. The largest portion of control of the LMS is in the hands of its designers, and then in those of the system administrator, often in turn constrained by institutional policies and structures. Some universities, such as our own, further split the hierarchy into authors/learning designers, teachers and tutors, each with diminishing levels of control. For economic reasons, and to simplify management, most LMSs are centralized systems, run in instances that support whole universities or, sometimes, departments. This means that the same features and facilities are provided to all, typically with some options for configuration but little control over the choice of tools and plugins. Inevitably, for those lower in the control hierarchy, this means that the system is not always going to be well-tailored to individual needs: compromises have to be made to suit the needs of all, including decisions about organization, scope and tools. The LMS is, as the name implies, a management system, not a learning system – though it can be used for learning. It is thus a means of monitoring and controlling activities. At the bottom of the hierarchy are the students themselves, who typically have very limited control – they are frequently not allowed to introduce nor even comment on content, begin or close conversations, add or remove features, have input

into assessment or in other ways allowed to initiate direction or process of the course. These affordances give considerable control and ownership to teachers (or developers, administrators, learning designers or managers) but little or none to students. It is not surprising, given this design pattern that, in an Australian study, Phillips (2006) found that the LMS «*was heavily used in a teacher-centred mode, with the majority of use in provision of content to students, and in students reading messages from their lecturers*» (p. 663). Beyond the content focus generally is the course focus of the LMS. Almost all divide the virtual space into objects that are named as 'courses'. Some (most versions of Blackboard, for example) do not even allow for a different vocabulary other than 'course' which, especially for international institutions that name such things as units, modules or papers, and that have a different meaning for the word 'course' is highly constraining. Not only is the LMS modelled on traditional educational structures and processes, they often draw upon parochial patterns from whence they derive. A traditional educational experience is more than a series of courses (Mott, 2010). It is enriched by the spontaneous and serendipitous personal interactions and knowledge insights that arise from interactions amongst classmates, community acquaintances, teachers, family and work colleagues – the vast majority of which occurs beyond classroom walls. One of the ongoing challenges of higher education is to increase relevance and authenticity – living in worlds exclusively defined and created by any higher education institution does not meet this larger goal of higher education (Kasemsap, 2016).

Finally, we are entering a world defined by continuous and user driven education opportunity and requirement (Selwyn, 2010). Habitation exclusively in institutional controlled spaces in which students are given only the role of (often paying) guests, does not empower nor encourage them to creatively manage and direct their own learning. These concerns have prompted a number of authors (Bogdanov, Ullrich, Isaksson, Palmer, & Gillet, 2012; Brown & Peterson, 2008; Mott, 2010) to itemize and generally decry these forms of LMS-centric learning, and to propose social network or Personal Learning Environments as an alternative. We next turn to describing these learning contexts.

3. SOCIAL NETWORKS

The description of the LMS above contrasts with the focus on openness, digital identity, cooperation and collaboration that define social networks. Social networks can be considered one component of a Personal Learning Environment. Johnson, Levine and Smith (2009) define PLEs as the «*tools, communities, and services that constitute the individual educational platforms that learners use to direct their own learning and pursue educational goals*» (p. 1). Kietzmann, Hermkens, McCarthy and Silvestre (2011) present a framework that defines social media by using seven functional building blocks: identity, conversations, sharing, presence, relationships, reputation, and groups. From these two descriptions we find now familiar social networks tools such as LinkedIn, Facebook, WenWen, SinaWeibo and WeChat. It is unlikely that there are more than a very tiny minority of university students globally who are not members of one or more of these commercial networks. However, though not beyond experimental use, these commercial services are rarely integrated into formal programs in higher education, and with good reason. There are great risks to privacy and uncontrollable changes in such systems that eliminate or subvert their value. At the root if a mismatch between teacher-controlled pedagogical and institutional needs, commercial hosts selling user page views to advertisers, and students attempting to control their own social spaces (Kent & Leaver, 2014).

For all these risks, there are a number of compelling reasons for exploration of networks beyond the sheltered and controlled context of the LMS. First, is to give place and reason for serious exploration of these emerging spaces so that students (and teachers) gain in both network literacies and self-efficacy. Secondly, the self-directed skills developed while doing so are important for the development of civic sense and lead-

ership (Killam, Carter, & Graham, 2013). As Waghid argues, external social networking tools «*can enhance learner autonomy and equality, so that critical, self-reflexive thinking and disruptive thought and action, respectively, can be cultivated through technology-assisted education*» (p. 298). Thirdly, the artificial separation of learning and life is a consequence of our educational systems' designs, not a reason for it: learning happens best and persists longer when it occurs in the context in which it used authentically (Barab, Squire, & Dueber, 2000; Herrington, Oliver, & Reeves, 2003). Finally, since perhaps the most fundamental building block of education is interaction – amongst students, faculty and content (Anderson, 2003) – systems that promise to enhance interaction warrant serious attention from teachers, researchers and theorists.

Social media toolsets, like LMS systems, usually integrate a number of separate tools into a suite accessed from a single login. These include, but are certainly not limited to blogs, wikis, profiles, photos, microblogs, calendars and many more. Unlike LMS systems that are organized on the class level, most of these systems are based on networked models in which each user establishes a set of connections to groups (which may be course based, but could also be focused on other student interests), on networks of schoolmates, friends and acquaintances and sets of persons with common interests. Thus, each user (including all students) is both allowed, encouraged and empowered to establish formal and informal links and groups, to share and recommend and to comment on any items to which the owner has granted them permission to view. Thus, the social network is not at its roots teacher or institutionally organized and controlled, but is self-customized to meet the needs of individual users.

A key feature of social networks is they are much more open and porous than LMS systems. Connection in social networks typically cross boundaries, support both strong and weak connections and allow knowledge to expand outside of the formal education context. As the 2011 Horizon Technology (Johnson, Adams, & Haywood, 2011) reported, this openness in which 'community is the curriculum' is likely to have a large impact on teaching and learning within education around the globe and a time to large-scale adoption of four to five years. Finally, as Siemens and Weller (2011) note, social networking systems «*appeal to students precisely because they are not controlled in the same manner as an LMS*» (p. 167).

4. THE UNIQUE REQUIREMENTS OF DISTANCE EDUCATION

The campus experience, with its rich face-to-face opportunities for social, formal and informal interaction, often provides the social glue that binds together students in social commitments and an integration into the academic, institutional and disciplinary communities for which they are training. These opportunities are too often absent in the distance context. Notable efforts – including earlier work on the now very popular Community of Inquiry model (Garrison, Anderson, & Archer, 2000) – have focused on developing multiple sense of 'presences' – in social, teaching and cognitive forms, within the context of the LMS. While certainly possible, creating rich communities within a context designed to support a temporal learning group is challenging. Community in a geographic sense is not created in a single residence, but rather moves outwards and develops networked-based interactions amongst residents from many homes. Learning communities also require space and invitation to grow beyond tight confines of a single course or institution. After a review of the current literature on professional development and integration opportunities for distance students, Fontaine and Cook (2014) argue that «*creating virtual communities and designing a virtual campus experience does hold promise in providing a learning experience for non-traditional distance learners that strives to educate the whole student*» (n. p.).

In addition to affording flexibility of time and place we are also interested in expanding the learners' control of their educational space through control and ownership of their discussions, contributions and potential collaborations. These interactive freedoms open up greater possibility for students to have input into the

content, assignments and assessments involved in their study. Thus, social networking not only increases learners agency, but potentially their engagement that «*emphasizes the shift of control and ownership from the educator or the designer to the learner*» (Buchem, Tur Ferrer, & Holterhof, 2014, p. 15).

5. POSSIBLE INTEGRATION PATHS. LMS AND SOCIAL NETWORKING SYSTEMS

LMSs and social media share some similarities – they are both digital platforms with read/write capabilities that are designed or can be used for teaching and learning. However, as we have described earlier, they have notable differences – many of which directly affect the potential for social interaction, community and networked building. A number of authors have proposed technical ways to integrate – at least at the user interface level, these tools using interoperability standards, mashups and widgets (see, for example, list of projects presented by Wild, Kalz, & Palmér, 2008). A further example of these is the use of a set of Open Social Apps that teachers can optionally add to their Moodle LMS as described by Bogdanov, Ullrich, Isaksson, Palmer and Gillet (2012).

However, as many educational technology researchers have come to know, adoption and integration beyond use by the original team of developers is challenging and, more often than not, learning enhancement tools fail to be used effectively and adopted even within the contexts within which they were designed (Kirkwood & Price, 2014). However, unlike the efforts to support adoption of novel educational tools, these networked tools are in wide use already outside of the educational context. There is some evidence to suggest that some students wish to keep separate their social and their academic lives and these students may resist teachers and formal education intruding into their personal online worlds – however this seems to relate to specific social networks notably Facebook (Manca & Ranieri, 2016) and not to other genre of network media (Taylor & Mulligan, 2012). Moreover, there is also evidence that students are aware of the affordances of these tools for a very wide range of tasks and challenges (Stacy & Zayer, 2015). For example students use of the networking, collaboration and support of these tools to enhance their learning in formal education is common – even when they are not prescribed as formal learning activities by the teachers (Smith, 2017).

Innovative teachers are also using commercial web 2.0 tools for formal teaching and learning outside of the formal LMS environment. These efforts are usually led by early adopters and controlled by individual teachers – such as ownership of class Facebook, Twitter, LinkedIn or other groups (see for examples of these, an edited book summary by both proponents and critics of Facebook use: Kent & Leaver, 2014). The learning artifacts socially created in these informal contexts can be harvested and aggregated – thus making it available for use and possibly assessment by teachers within the secure LMS (Conde et al., 2014). These approaches offer advantage over exclusive use of LMS systems as students are often active in these contexts already and integration can channel interest, motivation and relevance of 'real life' to formal study. However, the disadvantages of such integration with commercial social media tools include the data mining of student behavior by outside commercial firms; the potential loss of data to sale or closure of commercial services, changes in corporate privacy or security policies, the general lack of either student or teacher control of the external tools and the necessity for students to participate in these commercial ventures – even if they are reluctant to do so (Manca & Ranieri, 2016). Finally, as a University of Toronto web page cautions, exclusive use of the institutional system (as opposed to a variety of teacher chosen tools) provides "Consistency, Security, Accountability and Sustainability"[1].

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[1] http://www.english.utoronto.ca/Page2272.aspx

The challenges of integration of diverse teaching and learning applications coupled with the need for teachers and disciplinary groups to customize the learning environment to meet a host of disparate needs has led for a call to build systems that integrate functionality of many tools. One such proposal is for a Next Generational Digital Learning Environment that is «*envisioned not as a single, large application but as an ecosystem, one that functions as a confederation of IT systems and application components that adhere to common standards, both technical and otherwise, that would enable diversity while fostering coherence*» (Educase, 2015, p. 1). While we look forward to these 'next generation' systems, we find it useful to reflect upon and document our own efforts over the past seven years in creating the Athabasca Landing as a case study.

5.1. *An Integration Model. The Athabasca Landing*

We have developed a set of social media tools that are hosted internally within the university's protective boundaries, but which maximize student freedom, choice and opportunity. We are building what programmers often describe as a 'walled garden' but with many windows for both looking in and out.

We used the Elgg (elgg.org) based social media and network platform to create a social networking application that can be used by any teacher, administrator or student at Athabasca University to create many different kinds of individual, group, network and set communications. The system is called Athabasca Landing in recognition of the original river landing upon which the town of Athabasca was founded. Elgg is an open source framework, specifically designed to support the development of customized social networks. It consists of a few core components and hundreds of mostly community-developed plugins that can be integrated in many ways to create customized social networks. Elgg installations are used for a variety of educational, commercial and health care applications and these can be accessed from both Internet connected mobile and desktop devices. An example of its use beyond education is Wang, Liu, Lei and Wang's (2014) description of a mobile application developed and tested in rural China. Within education contexts Elgg is used by both small and large education institutions located around the world. For example, Ardito (2016) describes how Elgg was used with reported positive results amongst educational graduate students. Sarasty and Fernández (2015) document Elgg use in undergraduate mathematics classes in Chile and De-Marcos, Domínguez, Saenz-de-Navarrete and Pagés (2014) present a quasi-experimental study in which Elgg was used in undergraduate computer applications courses in Spain.

We choose the Elgg platform for three reasons. The first was the very fine tuned permissions that allow every user (including students) to determine the level of access (from friends, to teacher(s), to everyone in the school, to the whole Internet – including search engines) on a per-post basis. This is very different from the role-based access model embodied in most LMSs, where access to any post is determined by one's role within the system. As we have argued previously (Dron & Anderson, 2014), there is no one privacy setting that works for all people and for all content – what is perceived as breach of privacy by some can be perceived as a curtailment of freedom by another.

The second reason we choose Elgg for this application was the freedom it gave to both ourselves and to our users to develop and integrate features and plugins and thus serve as a test-bed for theoretical development of social models of learning. Finally, we had hoped that institutional ownership and technical control of the system would alleviate some student and teacher resistance to using commercial or unsecure Internet resources.
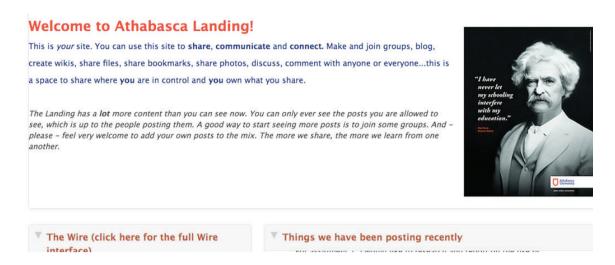
Figure 1. Landing home page, landing.athabascau.ca.

As Figure 1 shows, the opening page welcomes visitors and users and encourages them to login. Without logging in, only a subset of the content and contributions are visible to visitors. After login a user can customize their home page so as to show personalized lists of people, date, events and links with which they have an interest (Figure 2).
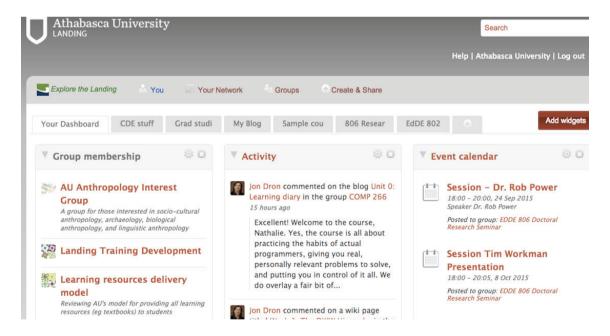

Figure 2. Screen shot of the Landing showing customized view for an individual user.

6. CARROTS AND STICKS

Performance in formal courses is normally tightly controlled by the expectations and demands of teachers. Usually, interactive online courses have requirements for contribution and participation by students. These requirements typically are that each student post and respond to a certain number of postings (components of which may be assessed by teachers), over some length of time. This compulsory use of rewards and punishments, though very common, is not without its critics. Students often complain of the artificiality and challenges of creating original postings (Vrasidas & McIsaac, 1999), while theorists have long noted the detrimental and often counterproductive to learning and short term effect of externally motivated activity (De Meyer, Soenens, Aelterman, De Bourdeaudhuij, & Haerens, 2016; Kohn, 1993).

On the Landing, we attempted to create an environment in which student choice was maximized. To support this choice, we developed rules such as not automatically joining users to groups (they must voluntarily join either class or other social groups), nor forcing students to build networks nor forcing them to make a specific numbers of contributions. Of course, this bottom-up approach allowed users freedom to modify our rules and both students and teachers created groups, artefacts and activities for which they used a variety of incentives and punishments to induce interaction. As Kotturi, Kulkarni, Bernstein and Klemmer (2015) argue «*Peer learning platforms sit not in a social setting, but in an educational setting, which has its own logic of incentives: both carrots and sticks are required to keep the commons vibrant*» (n. p.). In a case study of one self-paced undergraduate class using the Landing we allowed teachers to set course expectations for use and through a survey determined that 84.2% of students felt that 5% of final grade allocated to making an annotated bookmark or blog post to the class group was about the right amount of reward for the activity (Anderson, Upton, Dron, Malone, & Poelhuner, 2015).

Other teachers take different approaches. I (first author) require and assess a blog reflection with links to the contributions each student has made to their learning community. I (second author) do not enforce participation at all in any of my courses and, though sharing of all work is the default expectation, students are free to limit what they share to only their tutor if this makes them uncomfortable. They can be as private and insular as they wish. About as many limit access in this way as share their work with the entire world, though the vast majority go with the default. This process works because of the assessment design and individualized activities that ensure student contributions are always unique. Students may use *any* evidence of competence from the course in their final portfolios, including help given to others, shared bookmarks, conversations with others and so on, so there are incentives to participate beyond the innate value of social engagement, even though they are not so obvious and extrinsic as a grade. It might therefore be seen as a carrot, but it is just part of a smorgasbord and they can choose not to aim for it if they prefer some other reward, intrinsic or otherwise (Dron, 2012).

As another example of social mixed with authoritarian inducement, Kotturi et al. (2015) emailed some students in a social mediated course that their peers were counting on them for contribution: «*without a reminder email, only 21% of students who signed up for a discussion slot actually showed up. With a reminder email, this follow-through rate increased to 62%*» (n. p.). Cultivating a social platform is not quite like letting a jungle grow. It is closer to gardening. Wenger, White and Smith (2009) talk of 'technology stewardship' to describe the rich and multifaceted role that champions play in developing social communities. These roles blur the boundaries between social, technological and pedagogical activities and components of the educational experience. Kotturi et al's intervention (2015) is not a simple social intervention but is intimately bound up with the structures, power relationships, technologies and processes that lie behind the academic community that they support. Thus, we encourage both teachers and users to use the Landing platform (and to encourage their colleagues), to build and develop personal connections for whatever

scholarly, administrative or social application they wish. In encouraging that use, we are as much a part of the platform as the plugins, hardware and protocols that it uses.

7. RESULTS

It is challenging to accurately assess the impact of an ever-evolving academic and social environment. However Bersin (2008) reminds us that «*these tools are user-driven by nature, so the measure of success is participation*» (n. p.). During its six years of operation over 9,200 staff and students have logged into the system. Hundreds of groups have been created and 37,000 blog posts, 16,000 files, 8,600 bookmarks, 12,000 wiki pages and over 4,800 tweets have been generated. Many of these users are students who used the Landing for course related requirements. We estimate that these account for up to a quarter of its users, based on membership of course-related groups. However, many other students and faculty have devised additional ways in which the environment can be used to enhance their teaching or learning experience. Some individuals have set up cross-cutting groups relating to subjects as diverse as computer programming, anthropology and zombie research, many of which remain active after several years. In all such successful cases, they are driven by people with passionate interests. One of the perennial problems we face, however, with a transient student population and staff that move on to other things, is that, once those passionate individuals no longer remain involved, the groups they catalyze tend to enter hibernation, only rarely becoming active again if and when others take on the mantle. We have only seen that occur a couple of times, notably in groups that support union activities. When there are no formal processes to keep a group alive, critical passion is, if anything, more important than critical mass.

Athabasca University is a completely online institution, does not have a campus nor classrooms. Thus, the Landing potentially provides a virtual campus in which the type of planned and serendipitous interactions that enrich campus-based universities can (at least to a degree) be realized. The Landing also offers permanence not found in a typical LMS system in which contribution usually disappear after the end of a course. Rather, on the Landing, owners are able to keep class groups open and welcome new students. This allows an archive of activities (discussions, blog posts, wikis and bookmarks) and outcomes (papers, project and research reports, etc.) to be created that allow current students to build upon the work of previous students. Stuart Berry (2014, 2016) studied the use and effect of student use of a growing Landing archive in a distance education graduate course and concluded that the Landing «*as a virtual classroom can offer a richness and an openness through its capacity to create, annotate, rate, and comment upon persistent artifacts*» (Berry, 2014, p. vii). The positive use of the Landing to support Athabasca's unusual model of self-paced and continuous enrollment courses was also documented by Anderson, Upton, Dron and Malone (2015). This archive permanence extends to student alumni who are allowed continuing access to the Landing – even after the end of their formal education with our university.

8. CONCLUSIONS

Chad Udell (2014) describes the extensions and new affordances of both old technologies (blogging, radio, email) and the new ones associated with mobile technology (camera, motion detector, heart beat monitor, geolocation, portable memory, microphone, notifications, touch screen, etc.). Not only do these bring immediate and often obvious improvements for learning, but as importantly they open a view to what Kauffman (2000) refers to as the 'adjacent possible'. These new possibilities are often not thought of by the original designers or builders, but rather emerge from the innovative insight and the ever-changing context in which the device is used. It is in support of these contextualized innovations that the Landing was de-

signed. The Landing is, quite deliberately, incomplete, waiting for the processes and structures of its users to fill an indefinitely large multitude of purposes. It is what Patel (2003) refers to as a 'deferred' system, an environment and toolset that only becomes something as it is used for an unknown number of possible purposes by its users.

We have operated and continue to enhance the features and the ease of use of the Landing, but in many ways it remains an innovation outside of the mainstream of university strategic and operational thinking and support. For nearly seven years it has been, and continues as, an innovative research experiment. We have tried, but to date not succeeded, in generating the type of institutional support enjoyed by the official LMS system. This insecurity creates a vicious circle in which users are reluctant to support and build upon an innovation that may disappear. Martin Weller (2013) argues that educational institutions have evolved to spend millions on support of monolithic LMS systems yet often have great difficulty in supporting $500 faculty innovations. Groom and Lamb (2014) further note that *«the myriad costs associated with supporting LMSs crowd out budget and staff time that might be directed toward home-grown, open-source, and user-driven innovation»* (n. p.).

The development of online teaching and learning environments is costly and complicated – regardless of the type of system created. Thus, the resources allocated for the task must have both policy and fiscal support from University administration. Bartholomew and Hayes (2015) in a discussion of policy support for technology enhanced learning argue for systems that focus on human agency to adapt and configure the tools and techniques of learning. Only through this adaptability can the system accommodate the wide variety of personal, cultural and disciplinary diversity that defines quality teaching and learning. They contrast this with policy that focuses on the design and implementation of commissioned products, including LMS systems, that enhance technical capacity but usually suffer from underutilization.

A second hurdle relates to the challenge of developing a home-grown system in an era of very high user expectations defined by large commercial offerings such as Facebook, LinkedIn or Beebo. The global Elgg community continues to develop the available tool set, but it too suffers from lack of institutional support. We continue to wait (with impatience), but remain confident, that the type of flexible and user-friendly tools coming to dominate commercial and even government applications will positively influence the development of similar systems in university and especially distance education contexts.

The final constraint results from the challenge of change itself. In a blog post van Harmelen (2006) decries that systems like the Landing *«in their most useful incarnations, can only be used to full advantage with a fundamental change in pedagogic practice and that institutions may be wary of a consequent loss of control of their teaching and learning processes»* (n. p.). Indeed, administration and some of our colleagues are wary of a loss of centralized control. However, learning has never, and cannot be confined within, nor is it the exclusive domain of any single system or institution. Part of our role as education developers and advocates is to both advocate for and build systems that provide access for students to not only content, but also to rich communities and social opportunities that support and develop their sense and skills of self-determination.

9. ACKNOWLEDGEMENT

10. REFERENCES

Anderson, T. (2003). Modes of interaction in distance education: Recent developments and research questions. In M. Moore & W. Anderson (Eds.), *Handbook of Distance Education* (pp. 129-144). Mahwah, NJ: Erlbaum.

Anderson, T., & Dron, J. (2012). Learning technology through three generations of technology enhanced distance education pedagogy. *European Journal of Open, Distance and E-Learning,* 2012/2.

Anderson, T., Upton, L., Dron, J., Malone, J., & Poelhuner, B. (2015). Social interaction in self-paced distance education. *Open Praxis, 7*(1), 7-23.

Ardito, G. (2016). Learning in Commons: Investigating the impact of a social network on the learning of technology graduate students. In *Proceedings of E-Learn: World Conference on E-Learning* (pp. 1126-1131). Washington, DC: Association for the Advancement of Computing in Education (AACE).

Barab, S. A., Squire, K. D., & Dueber., W. (2000). A co-evolutionary model for supporting the emergence of authenticity. *Educational Technology Research and Development, 48*(2), 37-62.

Bartholomew, P., & Hayes, S. (2015). An introduction to policy as it relates to technology enhanced learning. In J. Branch, P. Bartholomew & C. Nygaard (Eds.), *Technology Enhanced Learning in Higher Education*. Faringdon, UK: Libri Publishing.

Berry, S. (2014). *Tacit knowing made visible: The use and value of an online archive.* Ed.D. Thesis, Atahabasca University. Retrieved from https://dt.athabascau.ca/jspui/bitstream/10791/42/3/SCBerry-EdD-rev2.pdf

Berry, S. C. (2016). Persistent Artefacts in an Online Classroom: The Value of a Dynamic Learning Archive| Artefacts persistants dans une salle de classe en ligne: la valeur d'une archive dynamique de l'apprentissage. *Canadian Journal of Learning and Technology/La revue canadienne de l'apprentissage et de la technologie, 42*(2).

Bersin, J. (2008). Social networking and corporate learning. *Certification Magazine –MediaTec Publishing Inc, 10*.

Bogdanov, E., Ullrich, C., Isaksson, E., Palmer, M., & Gillet, D. (2012). From LMS to PLE: A Step Forward through OpenSocial Apps in Moodle. In E. Popescu, Q. Li, R. Klamma, H. Leung & M. Specht (Eds.), *Advances in Web-Based Learning – ICWL 2012* (Vol. 7558, pp. 69-78). Berlin Heidelberg, DE: Springer.

Brown, G., & Peterson, N. (2008). The LMS Mirror: School as We Know IT versus School as We Need IT and the Triumph of the Custodial Class. *Journal of Online Learning and Teaching, 4*(2), 190-197.

Buchem, I., Tur Ferrer, G., & Holterhof, T. (2014). Learner control in Personal Learning Environments: A cross-cultural study. *Journal of Literacy and Technology, 15*(2)*,* 14-53.

Conde, M. Á., García-Peñalvo, F. J., Rodríguez-Conde, M. J., Alier, M., Casany, M. J., & Piguillem, J. (2014). An evolving Learning Management System for new educational environments using 2.0 tools. *Interactive Learning Environments, 22*(2), 188-204.

Dahlstrom, E., Brooks, D. C., & Bichsel, J. (2014). *The Current Ecosystem of Learning Management Systems in Higher Education: Student, Faculty, and IT Perspectives: Research report.* Louisville, CO: ECAR.

De Meyer, J., Soenens, B., Aelterman, N., De Bourdeaudhuij, I., & Haerens, L. (2016). The different faces of controlling teaching: implications of a distinction between externally and internally controlling teaching for students' motivation in physical education. *Physical Education and Sport Pedagogy, 21*(6), 632-652.

De-Marcos, L., Domínguez, A., Saenz-de-Navarrete, J., & Pagés, C. (2014). An empirical study comparing gamification and social networking on e-learning. *Computers & Education, 75*, 82-91.

Dron, J. (2012). The pedagogical-technological divide and the elephant in the room. *International Journal on E-Learning, 11*(1), 23-38.

Dron, J., & Anderson, T. (2014). *Teaching crowds: Learning and social media*. Edmonton, CA: Athabasca University Press.

Educase (2015). *7 Things You Should Know About NGDLE*. Louisville, CO: Educause.

Fontaine, S. J., & Cook, S. M. (2014). Co-Curricular Engagement for Non-Traditional Online Learners. *Online Journal of Distance Learning Administration, 17*(3).

Garrison, R., Anderson, T., & Archer, W. (2000). Critical inquiry in text-based environment: Computer conferencing in higher education. *Internet and Higher Education, 2*(2-3), 87-105.

Groom, J., & Lamb, B. (2014). Reclaiming innovation. *Educause Review, 49*(3).

Herrington, J., Oliver, R., & Reeves, T. (2003). Patterns of engagement in authentic online learning environments. *Australian Journal of Educational Technology, 19*(1), 59-71.

Joel, S. (2015). Learning Management System success: Increasing Learning Management System usage in higher education in sub-Saharan Africa. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 11*(2), 51-64.

Johnson, L., Adams, S., & Haywood, K. (2011). *The NMC Horizon Report: 2011*. Austin, TX: The New Media Consortium. Retrieved from http://www.nmc.org/pdf/2011-Horizon-Report-K12.pdf

Johnson, L., Levine, A., & Smith, R. (2009). *The 2009 Horizon Report*. Austin, TX: The New Media Corporation. Retrieved from http://www.educause.edu/ir/library/pdf/CSD5612.pdf

Kasemsap, K. (2016). The roles of lifelong learning and knowledge management in global higher education. *Impact of economic crisis on education and the next-generation workforce* (pp. 71-100). Hershey, PA: IGI Global.

Kauffman, S. (2000). *Investigations*. New York, NY: Oxford University Press.

Kent, M., & Leaver, T. (2014). *An Education in Facebook? Higher Education and the World's Largest Social Network*. New York, NY: Routledge.

Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons, 54*(3), 241-251.

Killam, L. A., Carter, L. M., & Graham, R. (2013). Facebook and issues of professionalism in undergraduate nursing education: Risky business or risk worth taking? *Journal of Distance Education, 27*(2).

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: what is 'enhanced' and how do we know? A critical literature review. *Learning, Media and Technology, 39*(1), 6-36.

Kohn, A. (1993). *Punished by Rewards: The Trouble with Gold Stars, Incentive Plans, A's, Praise, and Other Bribes*. Boston, MA: Houghton-Mifflin.

Kotturi, Y., Kulkarni, C., Bernstein, M. S., & Klemmer, S. (2015). *Structure and* messaging techniques for online peer learning systems that increase stickiness. In *Proceedings of the Second (2015) ACM Conference on Learning@ Scale (L@s 2015)*, March 14–18, 2015, Vancouver, BC, Canada.

Macfadyen, L. P., & Dawson, S. (2010). Mining LMS data to develop an "early warning system" for educators: A proof of concept. *Computers & Education, 54*(2), 588-599.

Manca, S., & Ranieri, M. (2016). Is Facebook still a suitable technology-enhanced learning environment? An updated critical review of the literature from 2012 to 2015. *Journal of Computer Assisted Learning, 32*(6), 503-528.

Mott, J. (2010). Envisioning the post-LMS era: The Open Learning Network. *EduCause Quarterly, 33*(1), 1-9.

Muñoz, A., Lasheras, J., Capel, A., Cantabella, M., & Caballero, A. (2015). OntoSakai: On the optimization of a Learning Management System using semantics and user profiling. *Expert Systems with Applications, 42*(15–16), 5995-6007.

Patel, N. (2003). Deferred system's design: countering the primacy of reflective IS development with action-based information systems. In N. Pathel (Ed.), *Adaptive evolutionary information systems* (pp. 1-29). Hershey, PA: IGI Global.

Phillips, R. (2006). Tools used in Learning Management Systems: analysis of WebCT usage logs. In *Proceedings of the 23rd annual ascilite conference: Who's learning? Whose technology?*, pp. 663-673.

Sarasty, M. F. S., & Fernández, M. F. B. (2015). Elgg social network software readjustment to mathematics education: a study case. In *Proceedings of 2015 10th Iberian Conference on Information Systems and Technologies (CISTI)*, Aveiro, 2015, pp. 1-6.

Selwyn, N. (2010). Looking beyond learning: Notes towards the critical study of educational technology. *Journal of Computer Assisted Learning, 26*(1), 65-73.

Siemens, G., & Weller, M. (2011). Higher education and the promises and perils of social network. *Revista de Universidad y Sociedad del Conocimiento (RUSC), 8*(1), 164-170.

Smith, E. E. (2017). Social media in undergraduate learning: categories and characteristics. *International Journal of Educational Technology in Higher Education, 14*(12), 1-24.

Stacy, N., & Zayer, L. (2015). Students' Perceptions and Experiences of Social Media in Higher Education. *Journal of Marketing Education, 37*(3), 133-143.

Strayer, J. F. (2007). *The effects of the classroom flip on the learning environment: a comparison of learning activity in a traditional classroom and a flip classroom that used an intelligent tutoring system*. Ohio State University.

Taylor, S., & Mulligan, J. (2012). Facebook, social networking, and business education. *American Journal of Business Education, 5*(4), 1-12.

Udell, C. (2014). Storing Preferences and Inferring Intent in Mobile Learning Experiences. In C. Udell & G. Woodill (Eds.), *Mastering Mobile Learning* (pp. 137-140). Hoboken, NJ: John Wiley.

van Harmelen, M. (2006). *Personal Learning Environments make a step forward.* Retrieved from http://fm.schmoller.net/2006/07/personal_learni.html

Verbert, K., Duval, E., Klerkx, J., Govaerts, S., & Santos, J. L. (2013). Learning analytics dashboard applications. *American Behavioral Scientist, 57*(10), 1500-1509.

Vrasidas, C., & McIsaac, M. S. (1999). Factors influencing interaction in an online course. *American Journal of Distance Education, 13*(3), 22-36.

Waghid, F. (2015). On the democratisation of science education through Facebook: implications for autonomy, equality and teacher education at universities. *South African Journal of Higher Education, 29*(2), 298-314.

Walker, D. S., Lindner, J. R., Murphrey, T. P., & Dooley, K. (2016). Learning management system usage. *Quarterly Review of Distance Education, 17*(2), 41-50.

Wang, Y., Liu, H., Lei, C., & Wang, L. (2014). A health care social network based on mobile P2P in rural areas of China. *Advances in Computer Science and Technology, 65*, 159.

Weller, M. J. (2013). *Twitter Is Your IT Support*. Retrieved from http://nogoodreason.typepad.co.uk/no_good_reason/2013/01/twitter-is-your-it-support.html

Wenger, E., White, N., & Smith, J. D. (2009). *Digital habitats: Stewarding technology for communities*. Portland, OR: CPsquare.

Wild, F., Kalz, M., & Palmér, M. (2008). Mash-Up Personal Learning Environments. In *Proceedings of 1st Workshop MUPPLE'08*, Maastricht, The Netherlands, September 17, 2008. Retrieved from http://nm.wu-wien.ac.at/research/publications/b740.pdf