

Moodle 2020: A Position Paper

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Abstract

We address key aspects of the future of Moodle in the context of types of change in technology environments, in particular Christensen's distinction between sustaining and disruptive innovations. Our focus is higher education worldwide, and our primary interest is in Moodle or its successors in 2020. This paper reviews the competition Moodle currently faces, and goes on to outline four potentially competing forms of learning environment architectures. Particular attention is paid to the implications of the semantic web. We conclude with a recommendation that the Moodle community needs explicitly to set up processes which in parallel to continuing evolution of Moodle 2.X and 3.X, systematically seek to design a next-generation learning environment. This will be based on semantic web-based technologies and pedagogies of the mid-21st century, rather than non-semantic technologies derived from the end of the 20th century, and pedagogic mindsets derived from the 19th century.

Keywords

Moodle, Virtual Learning Environments, e-learning futures, disruptive innovation, proactive learning

1. Introduction

The Moodle community is large and vibrant and has grown to be a major educational software provider. Moodle is a stable product, firmly positioned in the virtual learning environment market, with a clear roadmap for its steady evolution. However, its long-term future is far from assured, and a central aim of this paper is to review alternative ways in which the changing needs of the Moodle community, present and future, may be fulfilled.

In general Moodle is challenged on the one hand by other open source products, including even generic content management systems such as Drupal, and on the other hand by proprietary products, most particularly BlackBoard. This is a relatively mature market, dominated in the USA by Blackboard, whose share of the campus-standard LMS market fell to 51% in 2011 from 71% percent in 2006 (Campus Computing Project, 2011). Moodle had a 19% share of this increasingly competitive market. The historically rapid growth in Moodle new registrations now seems to have entered slow decline (moodle.org, 2012).

There are starkly different views about the future of learning environments, some of which were accentuated in the "VLE is dead" debate at ALT-C in 2009. This debate included advocates of personal learning environments (Tosh and Werdmuller, 2006), often focussed on informal learning, and critical both of formal learning and of tools such as VLE's which are closely associated with formal learning. More recently, others argue that the evolution of open courseware and MOOC's will challenge higher education traditions. Moodle is further challenged by elearning products which make little or no claim to be comprehensive (Pearson Education, 2012) and by innovative cloud based educational applications. Finally, it is challenged by university strategists who envisage a wide constellation of learning technologies and tools, with the VLE being "merely" one type of specialist application. This has been very clearly articulated at the University of Southampton (Millard et al, 2011).

Christensen (1997) is well known in the business strategy domain for his discussion of the "innovator's dilemma", where he distinguishes between evolutionary, "sustaining" change, and radical, "disruptive" change.

Disruptive change has the potential to alter the landscape of a business sector in ways that can threaten the most strongly established players and a concern explored here is whether the Moodle community could be threatened in this way. The term 'disruptive' is in practice often used in many different senses in the technology industry, most typically not based on Christensen's quite precise conceptualisation. A key feature of Christensen's disruptive technologies is that when they initially are invented, they are not only less attractive to existing users, they may well be more expensive and less functional as well. They do, however, tend to have characteristics which will in due course become attractive to a new type of user, and will subsequently displace the existing products.

Most of the challenges outlined above are essentially tactical, concerned with products available today and meeting today's problems and aspirations. But technology is a fast-moving area, and a key dimension of this paper is how technologies to enhance learning may develop over the next decade, and the implications of this for the Moodle community today. We argue that the community needs now to initiate its own disruptive activity, even though pedagogic mindsets in a typical university are currently perhaps geared more to the 19th than the 21st century.

2. Learning environment architecture options

This paper reviews a variety of VLE architectures and develops one that could be expected to emerge by 2020. We can divide the resources needed to implement a VLE into three types. Firstly, infrastructures are the basic level, most typically institutionally or even national; relatively static; commodity. Secondly, there is content, more related to the needs of schools, programmes and individual faculty and groups of students; relatively dynamic; often customised/proprietary. Finally there are tools – this particularly includes apps available to users to process and customise content, either traditional PC apps, tablet or cloud based.

Today we can consider three alternative VLE architectures, and also predict a fourth "next generation" one. A Transmissive architecture reflects the traditional teaching approach in most societies. A Constructivist architecture supports the learner to construct their own knowledge perhaps implying a more flexible, lightweight institutional learning environment (ILE) with VLE as one of several components. An Informal architecture rejects formal structures and processes, being auto-didactic and social. A Proactive architecture requires a semantic approach, highly personalisable, involving semantic web and agent-based applications, anticipating needs then fulfilling them instantly. The Proactive Pedagogy is not currently feasible, but may be by 2020 with advances in linked data standards and in artificial intelligence.

3. Semantic web for learning

The Semantic Web (SW) was first proposed by Tim Berners-Lee (Berners-Lee and Fischetti, 1999). There was a subsequent initial wave of interest not least in the computer science community, which fed through into the educational technology community. But despite individual initiatives, pilots, experiments and technological developments, the early interest seems to have slowed due to the considerable conceptual and practical problems of implementation. In the medium term (up to 2020) there will continue to be huge barriers to cross-institutional evolution of the semantic web, both due to reluctance to change and for competitive reasons. So in that interim period a minority of technologically competent universities will start setting up technology and information infrastructures which support SW activities. They will start experimenting with user-orientated software which does build up a cumulative picture of user actions and responses. They will also be developing intelligent agent software which when related to the SW-compliant data, and to the user activity records, will begin to show real benefits to learners in terms of both the efficiency and effectiveness of their learning.

The SW Learning Environment offers major possibilities. Firstly, a significantly increased chance of precisely finding relevant content online because there will no longer be reliance on crude sledgehammer search engines. Meaning as opposed to text will now be much more readily accessible. Secondly, the long standing educator's dream of personalised learning experiences will become entirely feasible. This may relate to prior knowledge, to perceived difficulty with already viewed resources and/or to learning style preferences. Though we will most likely retain student cohorts for sound social and administrative reasons, ten students sitting in a row in a classroom may have totally different data and information experiences in any given module. Finally, there will be continual absorption of individual learner behaviour and preferences, and also about the collectivity of learner behaviour and experiences

It can be seen that in terms of content the SWLE needs to move away from the fixed formal content so typically seen in the VLE's of 2012, towards exploitation of the almost unbounded resources that will eventually be

accessible via the SW. This will not alter the need for human teachers, coaches, mentors, learning designers but it will potentially radically change all of these roles. One particular strand of work, building on the concept of proactive computing (Tennenhouse, 2000), is proactive learning (Coronado and Zampunieris 2010), which has particularly involved developing software that is activated by actions or inactions by students in Moodle.

One possible future scenario, raised by the authors at the Dublin Moodle Moot in 2012, was the prospect of the emergence of a parallel learning environment to Moodle, to be known as “Eldoom!”. Here we provide a small fictional cameo taken from the predicted launch speech of Eldoom! in 2020:

Eldoom! has also just been launched. As you know, this is a greenfield learning environment with no code or concepts from Moodle, but has been developed in the spirit of and as part of the wider Moodle family.

It is vital to emphasise that Moodle and Eldoom! are not in fact alternatives. Frankly, the major users of Moodle really did not want even to consider Eldoom! It has appealed to only a minority of Moodle users, but it has appealed to them very much. In the long run there is little doubt that Eldoom! will displace Moodle as its tangible benefits become understood by both learners and institutions.

Eldoom! is a S2LE, a Social Semantic Learning environment. It was conceived by a small but articulate sub-set of Moodle users who were un-interested in the PLE, with its hostility to formal learning, but who also felt that the classic VLE was an insurmountable obstacle to pedagogic innovation.

Eldoom! is an unashamedly web 3.0 application. It has semantics as its very heartbeat - the social dimension is secondary and was really retained for sentimental reasons to echo the original 20th century idea of "social constructivism", itself obsoleted by the revolutionary development of the semantic web, also a 20th century idea from Berners Lee (1999) "The day to day mechanisms of trade, bureaucracy and our daily lives will be handled by machines talking to machines" .

Machines talking to machines means that almost everything in life is tracked/sensed. We understand what happens if a student has not opened the module handbook within 3 hours of start of module. An intelligent agent identifies this and takes action until the student does view. Eldoom! makes heavy use of ambient media. So that action about the handbook is communicated next time that student's RFID shoe activates a personalised message while walking past a public display.

van der Hijden (2012) concludes that to cope with strategic threats, such as those prefigured in this paper, the Moodle community collectively needs to take responsibility, eg via an International Moodle Association based along the lines of one already set up in the Netherlands. We would certainly concur that a specific and additional capability centre needs to be created by the Moodle community in order to progress disruptive Moodle 2020 scenarios such as Eldoom! This needs to be quite separate from existing structures which are of necessity concerned with evolving the current "sustaining" Moodle 2.X and most likely Moodle 3.X infrastructures.

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