Report on Exploration of Learning Management Systems

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**Introduction**

This paper explores learning management systems as a technological adjunct to education. Advantages and disadvantages of learning management system integration are discussed, along with explanations of the various categories of LMS products available.

The term *learning management system*, or LMS, is broad and encompasses a variety of software applications designed to improve productivity in education. At minimum, a LMS "…automates the administration, tracking, and reporting of training events" (Ellis, 2009). While this definition makes reference to unidirectional communication, most contemporary learning management systems also serve as a means to deliver content across multiple platforms, including mobile devices. The role of learning management systems as a frame for other operative educational technology tools (Moreno-Ger, Burgos, & Torrente, 2009; Veletsianos, Kimmons, & French, 2013) is also recognized. Apt for K-12 and higher education settings, learning management systems have been credited as necessary for improving human resource performance by maintaining strength of employee competence in corporate settings (Håland & Tjora, 2006).

**Commentary**

Without regard to its potential for consolidation of educational technology tools, the LMS alone has distinct advantages. Bidirectional communication of information permitted via a modern LMS eradicates spatial constraints that may exist in the traditional brick-and-mortar environment. Furthermore, automation associated with LMS incorporation allows educators to reallocate time customarily used for evaluation to content design and development. These distinct advantages of learning management systems allow for larger class sizes, including massive open online courses (MOOCs), while improving the quality of instruction parallel to consistency. Large attendance to a traditional course with space or ratio limitations required several instructors to teach smaller, individual classes. Indubitably, each class would experience some disparity with regard to content and style despite constancy of learning objectives.

The benefits of LMS use extending to the students are not limited to those that are speculative. Empirical data reveals that learning management systems contribute positively to prompt autonomy (Snodin, 2013), conceptual understanding (Psycharis, Chalatzoglidis, & Kalogiannakis, 2013), and motivation (Chaiprasurt & Esichaikul, 2013).

One may conjecture that increased autonomy would be poorly received by students, but empirical findings are contrary to this. It has been found that learners appreciate an increase in independence secondary to less direct teaching without any negative attribution to a lack of instruction (Sanprasert, 2010).

The improved conceptual understanding and motivation credited to LMS use is logical, given the relative ease in developing content that appeals to multiple learning styles. Currently,

prudent instructional designers can present a variety of activities targeting different styles with the rationale that one or more will be effective in motivating the learner and solidifying understanding. The detriment to this is that students will endure "busy work" assignments that are not appropriate for their particular learning style. The LMS of the near future is likely to be individualized with content and media correlated to learners' specific style as detected by the LMS (CAO & NISHIHARA, 2012). This should further improve motivation and conceptual understanding through LMS use.

Despite ample benefits, one must recognize that both tangible and incorporeal costs are associated with the launch and continued operation of a LMS. Significant costs are associated with the LMS software, IT infrastructure, and human resources (Rubin, Fernandes, & Avgerinou, 2013). Ellis (2009) expands on LMS costs and pricing models, citing that, "…additional consulting, technical configuration, and administrator training." is essential.

While such activities may be possible through an internal IT department, one should develop a strategic plan to ensure the dedicated team can avert future system limitations. LMS confines, such as configurability, will hamper instructional effectiveness (Wang, Doll, Deng, Park, & Yang, 2013). Despite Ellis' (2009) logical suggestion to analyze needs against LMS features, the pace of technology overrides the inclusiveness of any static list. For example, recent data elucidates additional considerations for LMS mobility (Chaiprasurt & Esichaikul, 2013) and incorporation of social media (Veletsianos et al., 2013). Vigilant understanding of individual learners' dynamic needs and preferences is an ongoing challenge presented. Thus, the team selected to maintain the LMS must have the capability to be readily responsive to changes in instructional theories and user preferences.

The introduction of a LMS may also result in a culture shift from instructor-led teaching to student-centered facilitation. This new relationship may be difficult for instructors and students to adjust to, especially if it occurs during an existing program. Furthermore, users who are not technologically savvy may underutilize features of the LMS. This has been found to decrease the likelihood of successful implementation (Malikowski, 2008). Associated lag time between implementation and instructional effectiveness may be discouraging since student satisfaction with such software is directly correlated to course satisfaction (Rubin et al., 2013).

## Products

Numerous learning management system products are available that, normally, have been categorized as either proprietary or open source software. The open source designation represents that it is free of charge with an open source code that may be modified by any user (U.S. Department of Health and Human Services, n.d.). Without verification of user expertise errors can ensue, but collaboration may also result in synergistic innovation of the product. Since software is shared amongst users, no one entity is responsible for providing assistance if

needed. Proprietary software is typically associated with a fee, but the isolated source code ensures consistency and these products characteristically offer customer service.

More recently, a third category of software has emerged that is challenging the former IT distribution models (compuBase, 2013). Software as a service (Saas), or "cloud", is now another option when determining the ideal LMS to meet particular needs. Saas is beneficial because updates occur seamlessly and technical support often parallels that of proprietary software at a fractional price. However, it is important to note that "cloud" service disruption can occur due to inclement weather, user influx, or hacking (Goldsborough, 2013).

One rapidly developing learning management system that has effectively synthesized multiple functionalities is Canvas by Instructure. Canvas is marketed as a "…commercial open source" LMS software that is "backed by the engineering team" and "…lives in the cloud" (Instructure, n.d.). Over the past two years, I have had the opportunity to design and develop courses using the Canvas LMS, witnessing its evolution via addition of beneficial features desired by users. To date, I have not had any reports of 'downtime' issues. Coding has been nearly eliminated with WYSIWYG design tools and easy to locate drag and drop links.  A screenshot of these features is included in the appendix. Multiple plug-ins are also available to link this learning management system to outside resources, while still permitting students to follow a sequential progression of course activities from any internet accessible device.

**Reflection**

In this exploration of learning management systems, I have had the opportunity to look at scholarly literature, manufacturer information, and discussion forums relating to learning management systems. This has given me the opportunity to evaluate the LMS holistically from perspectives pertaining to features, educational effects, and software classification. In doing so, I have gained the following insight.

While using the Canvas LMS for years, I wrongly presumed this was a proprietary learning management system. In fact, it is everything *except* a proprietary LMS! Despite the open source origin and cloud delivery of this product, the service and support offered by Instructure is outstanding. Acknowledging the potential for reasonable deficiencies, my view of open source and Saas/"cloud" software designations is favorable because of personal experiences. Following the multidimensional analysis of learning management systems, I still believe this is the most practical product for our Program's current needs.

I also was able to identify a future advancement for learning management systems that I speculate could earn the "LMS 2.0" label. The ability of a LMS to detect and target user learning styles using optical tracking is an ingenious idea that I am eager to see develop into a routine feature. I am confident that incorporating such a capability will exponentially increase the effectiveness of learning management systems, further contributing to the learning benefits of educational technology.

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## Appendix:

*Canvas by Instructure allows for simple course design through "What you see is what you get" (WYSIWYG) editing tools and readily located links to every component of the LMS site.*