e-Learning Terminology Trends – A Lens into Institutional Paradigms?

Craig Blewett

> Against the backdrop of debates about pedagogy and the future viability of higher education, an increasingly polarized technology argument is brewing (Mott).

Abstract

A disturbing dichotomy is becoming apparent within e-learning. On the one hand are reports of increasing use of e-learning environments by higher education institutions, however on the other hand are indications that the use is limited and pedagogically rigid. By exploring the changes in e-learning terminology and research foci over the past ten years it is possible to trace underlying pedagogical currents in higher education. The paper firstly presents a framework that classifies e-learning tools into three categories. Then using search engine count estimates based on both Google Scholar and five top ranked journals, the paper examines trends in the terminology associated with these three categories between 2001 and 2010. The findings indicate that Type 1 environments, typified by Learning Management Systems continue to dominate, while Type 2 environments such as Virtual Learning Environments are becoming increasingly popular. However, despite technological innovations in Web 2.0 platforms, Type 3 Personal Learning Environments appear to already be floundering. The results indicate that out-dated approaches to learning, supported by 'industrial-age' models may be hampering the adoption of alternative learning paradigms which are more readily supported by Type 3 environments. Future research may need to focus on exploring new informal learning environments, such as social networks, that are more authentic to the student learning and communication experience.

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Introduction

Higher education is not only being reshaped by developmental imperatives and relationships with the state and business, but also by the tools and technologies used and espoused by higher education institutions. These tools offer opportunities to explore new approaches to teaching and learning or alternatively to institutionalise existing pedagogies.

> While the Learning Management System has become central to the business of colleges and universities, it has also become a symbol of the higher learning status quo (Mott 2010: 1).

In the modern digital age these tools, or e-learning environments, are becoming the place where teaching and learning takes place (Heider, Laverick, & Bennett 2009). Whatever pedagogy is espoused, the e-learning environment is where the approach and theories are increasingly being delivered.

In a similar way to offline environments, where the environment reflects, and often perpetuates the pedagogy (Blewett, Quilling, Bulbulia & Kanyiwamuyu 2011), so too e-learning environments can reflect, and perpetuate, underlying paradigms and pedagogies. As such, an analysis of the various types of e-learning environments provides a lens to explore underlying paradigmatic orientations and approaches.

It is possibly the emerging tension between platform and pedagogy that has resulted in the dichotomy that seems to exist within e-learning. On the one hand it is argued that 'more and more instructors are beginning to abandon traditional approaches to instruction ... for cutting-edge strategies' (Heider *et al.* 2009:104) which is confirmed both by the increasing number of e−learning tools and universities actively promoting their usage (Williams, Karousou & Mackness 2011). However, on the other hand are claims that 'studies of diverse learners' use of new media cast doubt on the speed and extent of change' (Warschauer 2007: 41).

This raises the question as to why it is, when education technology advocates are lauding 'the advent of new technologies (that) will radically transform what people learn, how they learn, and where they learn' (Warschauer 2007: 41) and students in their non-academic lives are immersed in online spaces (Lim 2010), higher education seems to be making little progress in the use of e-learning environments.

> There is growing awareness in higher education of student levels of engagement in Web 2.0 environments, in contrast to their engagement in the learning management systems (LMSs) hosted by their institutions (Sclater 2008: 1).

In the face of the changing landscape, both pedagogically and technologically, this dichotomy needs to be investigated.

> The importance of understanding LMS as well as its related technologies lies in the role it will play in future approaches to instruction as the needs of today's learners are not being met by current approaches (Watson & Watson 2007: 31).

Exploring e-learning environments, which includes a long and changing list of terms, may provide insights into underlying institutional paradigms (Sclater 2008). However, not only is it important to investigate the evolution of the terminology associated with e-learning environments, but also to identify trends that this usage may signal (Zawacki-Richter, Backer & Vogt 2009).

This paper presents an analysis of academic literature relating to e-learning environments, in order to address the question of how the terminology associated with e-learning environments has changed? Examining the trends in terminology may provide insights into underlying paradigms and also signal future directions in the development of e-learning environments.

Firstly this paper will present a classification of e-learning environments into three types. Next the findings and analysis of the terms associated with the various types of environment will be presented. Finally a

discussion around what the trends in terminology indicates about pedagogies and university approaches to e-learning, will be presented.

Classifying e-Learning Environments

There is a lot of confusion in the terminology used for e-learning environments (Dobozy & Reynolds 2010). Terms such as Learning Management System (LMS) are substituted with Course Management System (CMS) or Virtual Learning Environment (VLE), etc. As a result, various attempts have been made to classify and explain the terminology associated with e-learning environments (Dobozy & Reynolds 2010; Mott 2010; Wilson *et al.* 2008).

Dobozy & Reynolds' (2010), framework provides a useful point of departure for this undertaking. They classify e-learning environments into three dimensions:

- Dimension 1: Foundation stage (come and grab)-LMS/VLE 1.0
- Dimension 2: Developing stage (come and interact)-LAMS/VLE 1.0
- Dimension 3: Experiential stage (come and be)-(MU)VLE/VLE 2.0

Using their three 'dimensions' as a point of departure, it is possible to identify three 'types' of e-learning environments. The *first type* of e-learning environment is associated with Learning Management Systems (LMSs). Dobozy and Reynolds (2010), refer to these as 'come and grab' environments. These environments are primarily concerned with management and content and are characterised by a 'product' focus (Mott 2010).

The *second type* of e-learning environment is associated with Virtual Learning Environment (VLEs). They refer to these as 'come and interact' as they are exemplified by the space where interactions take place (Dobozy & Reynolds 2010). These environments are characterised by a 'place' focus.

The *third type* is associated, with what they call, VLE 2.0. They refer to these as 'come and be' (Dobozy & Reynolds 2010). These environments are characterised by a 'people' focus. However, rather than versioning the second type (VLE), a more useful term for these environments are Personal Learning Environments (PLEs) (Mott 2010).

While this classification masks the inconsistencies in naming of environments, it provides a useful framework to analyse the names associated with the various e-learning environments and the nomenclature associated with the functions of these environments. Using an extended form of Dobozy & Reynolds' (2010) classification, a three type e-learning environment framework is presented below.

Type 1 - 'Product' e-Learning Environments

Type 1 e-learning environments focus on 'production' issues, mirroring the first generation of the Web. 'The first generation of the Web has much in common with an 'industrial' approach to material productive activity' (Watson & Watson 2007:30). These environments were (and are) concerned with the content and process of learning.

Williams *et al.* (2011:40) citing Collins and Halverson say that 'traditional modes of learning arose in response to the industrial revolution and were based on standardised mass-production'. Watson & Watson (2007:31) concur, stating that 'today's education system remains mired in the Industrial Age, putting the onus for learning on teachers, encouraging students to remain passive.' Type 1 e-learning environments typify this continued focus.

These environments have existed (and continue to exist) under a wide range of names, such as 'Learning Management Systems', 'Learning Content Management Systems', 'Managed Learning Environments', and 'Content Management Systems'. Watson & Watson (2007), drawing from The American Society for Training & Development use the following terms when describing the functional requirements of an LMS; 'integration', 'manage', 'administration', 'standards', 'configuration'.

Etymologically the nomenclature associated with these environments encourages a connection with 'product', 'management', and 'content' pedagogies. 'It has not gone unnoticed that even the term learning management system suggests disempowerment – an attempt to manage and control the activities of the student by the university' (Sclater 2008:1).

Critical theorists have long argued that language exhibits and carries epistemological baggage. 'It is crucial to appreciate the ways in which ... epistemological 'baggage' has already been packed into theories and

concepts' (Garry 2004:304). As such the nomenclature signals paradigmatic and pedagogical assumptions.

Watson & Watson (2007:28) in defining an LMS provide an interesting insight into the embedded pedagogy.

> An LMS is the infrastructure that delivers and *manages instructional content*, identifies and assesses individual and organisational *learning goals*, *tracks* the progress towards meeting those goals, and *collects* and presents data for *supervising* the learning process… An LMS delivers *content* but also handles course *registration* and *administration*, skills *gap analysis*, *tracking* and *reporting* (e.a.).

Obviously missing from this definition is the learner (Mott 2010). Learning goals are mentioned but as part of the management process. Most of the other words emphasised are management related. A pedagogical bias towards instructivism is revealed in the term 'manages instructional content'. The definition says that the 'LMS is the framework that handles all aspects of the learning process' (Mott 2010), yet the learner is missing.

These environments are the primary target of commercial offerings as they appeal to the institutional need for control and management, and allow lecturers (without any paradigm change) to switch from offline to online modes of delivery by uploading slides and other material (Mott 2010).

Type 1 environments, typified by LMSs resonate with elements of the 'Industrial Age', where the mechanisation, control and focus on production are central to the process. Type 1 environments are therefore referred to as 'Product' e-learning environments. 'They conform to a classroom metaphor, which may explain, at least in part, why we 'can't … stop lecturing online' (Mcloughlin & Lee 2007:668). Type 1 environments reflect elements of Behaviourism both in the nomenclature and embedded instructivist pedagogy.

Type 2 - 'Place' e-Learning Environments

Watson & Watson (2007) argue that society has progressed from the Industrial Age into the Information Age. This is supported by a concomitant move towards Type 2 e-learning environments. Type 2 environments focus

mainly on the 'place' of learning. While Type 1 environments focus on computerised systems (production), especially prior to the proliferation of the Internet through the World Wide Web, Type 2 environments seek to make use of the reach and virtual nature of the web. As such, Type 2 environments characterise the boom of the Information Age (Williams *et al.* 2011).

The terminology associated with Type 2 environments reveals a focus on the 'virtual' or 'place' aspect of the environment. Type 2 environments are called 'Virtual Learning Environments', 'Online Learning Environments', 'Collaborative Learning Environments', etc. Dillenbourg et al. (2002), make use of the following phrases in defining a VLE - 'information space', 'social space', 'turning spaces into places', 'virtual space'.

Due to Type 2 environments often being hosted in the cloud, rather than on institutional platforms, the focus moves from a lecturer-centric control to a lecturer/student control. In Type 2 environments lecturers are still responsible for course setup, administration, etc., but students typically have some options around customising their space, through themes and widgets. So while Type 1 environments focus on content, Type 2 environments focus on the space where the content is delivered and some of the affordances of virtual spaces, such as customisation (Williams *et al.* 2011).

Dobozy and Reynolds (2010) refer to these Type 2 environments as VLE 1.0, versioning the term VLE in an attempt to distinguish it from Type 3 environments. However, while Type 2 environments focus on the virtual nature of learning they have not fully embraced Web 2.0 with its development of a rich set of collaborative tools such as blogs, wikis, microblogs, and social networks (Al-Khatib 2009; Ullrich *et al.* 2008). While the underlying learning theories of Type 2 environments are not as obvious as in Type 1 environments elements of Humanism (focus on motivation) are apparent.

Type 3 - 'People' e-Learning Environments

Growing out of the affordances of Web 2.0, and particularly social technologies, is the next type of e-learning environment with its 'people' or

social focus. The focus of these environments unlike the previous types, 'what' and 'where' orientations, is on 'who'. 'Unlike the "industrial" artifactual nature of Web 1.0 products, Web 2.0 is defined by a "post-industrial" worldview focused much more on "services" and "enabling" than on production ... (more on) "leverage", "collective participation", (and) "collaboration"' (Lankshear & Knobel 2007:12).

While Watson & Watson (2007) argue that the 'information age' has replaced the 'industrial age', others suggest that we are now in the 'network age' (Castells 2004). This shift highlights another important transition in e-learning environments. While the 'industrial age' environments focused on 'product', the 'information age' environments focused on 'place', the current 'network age' age is neither the product or the place, but the connections between people. As such Type 3 e-learning environments characterise the network age and the nomenclature tends to focus on connectedness or personalisation.

A key element of Web 2.0 is the concept of networked spaces as exemplified in SNSs like Facebook (www.facebook.com) and Twitter (www.twitter.com). While Type 1 and Type 2 environments typically consist of a single space where the learning takes place, Type 3 environments, as typified by Personal Learning Environments (PLEs), are a 'mashup' of technologies that are made available to the user in a customisable way. Type 3 PLEs are 'not a pre-built collection of tools and content but a framework that allows a learner to assemble his own suite of applications and content sources' (Ullrich *et al.* 2008:710).

Typical Type 3 terms are Personal Learning Environments, Self Organising Learning Environments, Personal Learning Networks, Mashups etc (Dobozy & Reynolds 2010:94). In defining a PLE, Mott (2010) makes use of the following phrases - 'connections', 'students...select and organise', 'conversation-centered', 'personal space'. Emerging out of this is the focus of Type 3 environments on 'people', connections between people, and the personalisation of learning spaces.

> The PLE concept is relatively new as it pertains to the creation of enabling technologies that foster learning exchanges or networks that privilege the individual over the institution (Severance, Hardin & Whyte 2008:48).

In addition to the driving technologies of Web 2.0, Type 3 environments are 'motivated by a lifelong and informal learning agenda outside the boundaries of current institutionalized education', and its proponents are attempting to position it as a replacement of Type 1 and Type 2 environments (Sclater 2008:5).

Type 3 environments with their focus on the individual and building of spaces to learn contain paradigmatic suggestions of Cognitivism and its focus on building 'mental' structures to assist in learning. Additionally Type 3 environments also reflect elements of Constructivism and its focus on the construction of knowledge by individuals.

The above classification of e-learning environments into three types is somewhat artificial, as the generational evolution of the types is neither discrete nor neatly delineated. Elements of the functionality of Type 1 environments may be found in Type 2 environments and vice versa. However, in addition to providing a useful conceptual framework for understanding the evolution of e-learning environments, this categorisation provides a lens to examine the evolution of pedagogical paradigms at work in these environments and in higher education in general.

Research Method

One of the aims of this research is to determine how the phrases associated with the various types of e-learning environments have changed. The list of phrases associated with the three types of e-learning used for this research is shown in Table 1 below.

Type	Phrase	Abbreviation
1	Learning Management System	LMS
1	Learning Activity Management System	LAMS
1	Learning Content Management System	LCMS
1	Managed Learning Environment	MLE
1	Content Management System	CMS
1	Learning Support System	LSS

2	Virtual Learning Environment	VLE
2	Collaborative Learning Environment	CLE
2	Online Learning Environment	OLE

3	Personal Learning Environment	PLE

Table 1 - e-Learning Terms

While this list is not comprehensive, it does reflect some of the more commonly used terms associated with the various types of e-learning environments. Using this list, a two-fold approach was taken to determine the usage of these phrases in academic research between 2001 and 2010. The first approach made use of Google Scholar (scholar.google.com) and the second used top-rated journals.

Google Scholar

The first approach used Google Scholar's search engine count estimates (SECEs). Using SECEs to determine trends has become increasingly popular in recent years (Janetzko 2008) and is used for a range of purposes including tracking trends through word usage (Spörrle & Tumasjan 2011). Janetzko (2008:8) says that 'using query hits is beginning to gain acceptance as a kind of data that facilitates scientific studies'.

Google Scholar is considered a 'worthwhile' source for undertaking frequency type research within academic articles (Harzing & van der Wal 2008). However, it must be noted that there are issues of

> inclusion of non-scholarly citations, double counting of citations, less frequent updating, uneven coverage across disciplines and less comprehensive coverage of older publications/citations (Harzing & van der Wal 2008:2).

While these issues are noted, their impact is minimised due to the relative SECEs, and changes in SECEs, being more important than the absolute SECE values.

Use was made of Google Scholar's advanced search as this allowed

for both exact phrase matching and delimitation of the period. The following is an example of a search string generated to search for the phrase 'learning management system' in the year 2009: http://scholar.google.com/scholar?hl =en&q=%22learning+management+system%22&btnG=Search&as_sdt=0%2 C5&as_ylo=2009&as_yhi=2009&as_vis=0.

While Janetzko (2008) and Spörrle and Tumasjan (2011) suggest the use of multiple search engines to reduce biases, no other similar scholarly search engine exists. Other search engines such as www.google.com, www.yahoo.com, and www.bing.com index web pages, newspapers, and a range of other non-academic content. The intention of this research is to explore trends in the usage of e-learning phrases within scholarly articles. However, in an attempt to minimise any bias that Google Scholar's SECEs may contain, a second set of searches was performed using five top ranked journals.

Journal Searches

The second approach searched for the use of the keywords within top ranked journals on e-learning. Elbeck & Mandernach (2009), using a combination of factors (journal popularity, journal importantance, and journal prestige), identified the following five journals as the top ranked out of 46 reviewed;

1. International Review of Research in Open and Distance Learning
2. Journal of Asynchronous Learning Networks
3. eLearning Papers
4. Innovate: Journal of Online Education
5. American Journal of Distance Education

A variety of search approaches were used for these journals depending on whether they were open access, had suitable on-site search tools, etc. Table 2 summarises the search approaches used.

Journal Name	Type	Search
International Review of Research in Open and Distance Learning	Open Access	Google - e.g.: 'learning management system' site:.irrodl.org daterange: 2455198-2455562 (where numbers at end are dates in Julian format)

Journal of Asynchronous Learning Networks	Subscription	Ebscohost advanced search - e.g. 'JN "Journal of Asynchronous Learning Networks" AND TX "collaborative learning environment"'
eLearning Papers	Open Access	Site's advance search - e.g. http://elearningpapers.eu/en/search?keys=%22learning+management+system%22&content_type%5BArticles%5D=Articles&name=
Innovate: Journal of Online Education	Subscription	Ebscohost advanced search - e.g. 'JN "Innovate: Journal of Online Education" AND TX "collaborative learning environment"'
American Journal of Distance Education	Subscription	Ebscohost advanced search - e.g. 'JN "American Journal of Distance Education" AND TX "collaborative learning environment"'

Table 2 - Journal Searches

Table 3 presents an overview of the searches for each of the sources, including the date when each search was conducted. While Google Scholar has data ranging back to 1990 and before, for the sake of comparison with the 5 journals selected, the data was limited to the ten-year period 2001-2010, which most of the journals covered.

Source	Search Date	No. Articles	Dates Searched
Google Scholar	6 June 2011	unknown	2001-2010
International Review of Research in Open and Distance Learning	12 Jan 2012	approx. 500	2001-2010
Journal of Asynchronous Learning Networks	16 Jan 2012	approx. 370	2001-2010
eLearning Papers	16 Jan 2012	approx. 760	2002-2010

Innovate: Journal of Online Education	16 Jan 2012	approx. 210	2004-2009
American Journal of Distance Education	12 Jan 2012	approx. 260	2002-2010

Table 3 - Data Sources

Results

Firstly a comparison of the results between Type 1, 2 and 3 environments is presented, followed by the trends within each Type.

Comparison of Type 1, 2 and 3 SECEs

Table 4 shows the SECEs for the various terms associated with Type 1, 2 and 3 e-learning environments as reported by Google Scholar. While the absolute values depend on how many terms are included in each 'type' of e-learning category, they nonetheless provide a comparative indication of the frequency of usage of the various terms.

	TYPE 1						TYPE 2				TYPE 3	
Year	LMS	LAMS	LCMS	MLE	CMS	Total	VLE	CLE	OLE	Total	PLE	Total
2001	226	0	27	71	159	483	343	267	284	894	13	13
2002	553	0	83	74	340	1050	490	364	455	1309	39	39
2003	889	9	130	109	451	1588	677	402	498	1577	18	18
2004	1160	25	168	126	613	2092	828	465	658	1951	21	21
2005	1150	64	264	121	815	2414	950	518	791	2259	35	35
2006	1570	75	259	141	932	2977	1260	517	785	2562	68	68
2007	1950	96	314	108	985	3453	1390	587	909	2886	109	109
2008	2160	97	304	79	1030	3670	1540	604	971	3115	155	155
2009	2310	92	247	75	1170	3894	1870	574	938	3382	232	232
2010	2190	74	191	65	1030	3550	2020	601	900	3521	224	224

Table 4 - SECEs from Google Scholar

Figure 1 shows how Type 1 phrases dominate, although recent years have seen Type 2 phrases making more inroads into research. However,

comparatively, Type 3 'Personal Learning Environments' have received little attention.
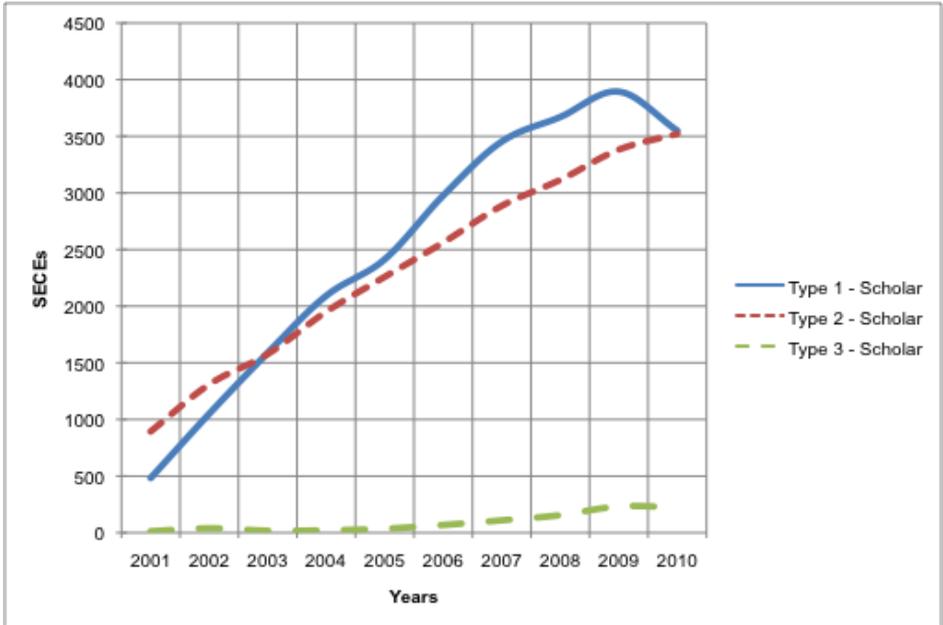

Figure 1 - Comparison of Type 1, 2, and 3 SECEs (Google Scholar)

A comparative count from the journals yields a similar set of results as shown in Figure 2. As can be expected with the smaller sample size, there are more obvious perturbations in the data.

The spike in Type 1 is mainly due to an increase in attention around the term 'Learning Management Systems' in the journal 'International Review of Research in Open and Distance Learning' in 2006. Fitting a linear trendline reflects the similarity in the term usage between the journals and Google Scholar. The journals, even more so than Google Scholar, depict the dominance of Type 1 phrases.
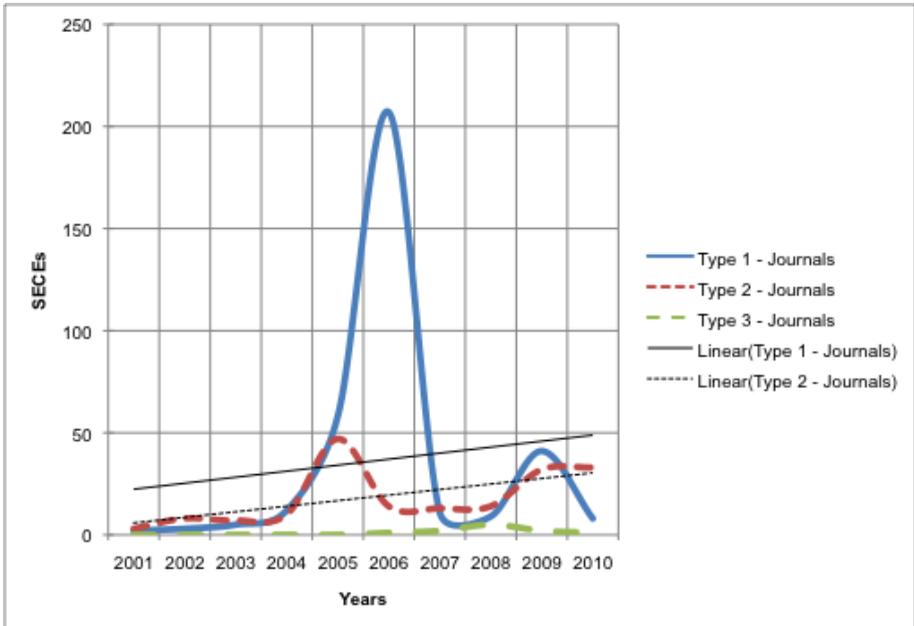
Figure 2 - Comparison of Type 1, 2, 3 SECEs (Journals)

Type 2 also exhibits a perturbation in 2005. This is mainly attributable to increased attention around the term 'Online Learning Environments' in the journal 'International Review of Research in Open and Distance Learning' in 2005. While the term 'Online Learning Environments' is used as a name for e-learning environments it is also used generically to refer to 'online learning environments'. This may have partially contributed to the spike in its usage in the journals. However, fitting a linear trendline once again reflects the similarity in term usage between the journals and Google Scholar, with Type 2 showing a steady increase in usage.

The results for Type 3 from the journals are similar to the results from Google Scholar. The journals had no mention of the term 'Personal Learning Environment' prior to 2006 and overall Type 3 environments received minimal attention in the journals. In fact the recent decrease in Type 3 SECEs is even more pronounced in the journal results than in Google Scholar.

The next section presents the trends for the terms within each type of e-learning environment.

Type 1 Term Usage

While Type 1 environments are characterised by a number of terms, Figure 3 shows that 'Learning Management Systems' is the dominant phrase. This domination of the phrase has resulted in the term becoming synonymous, in some respects, with e-learning environments.
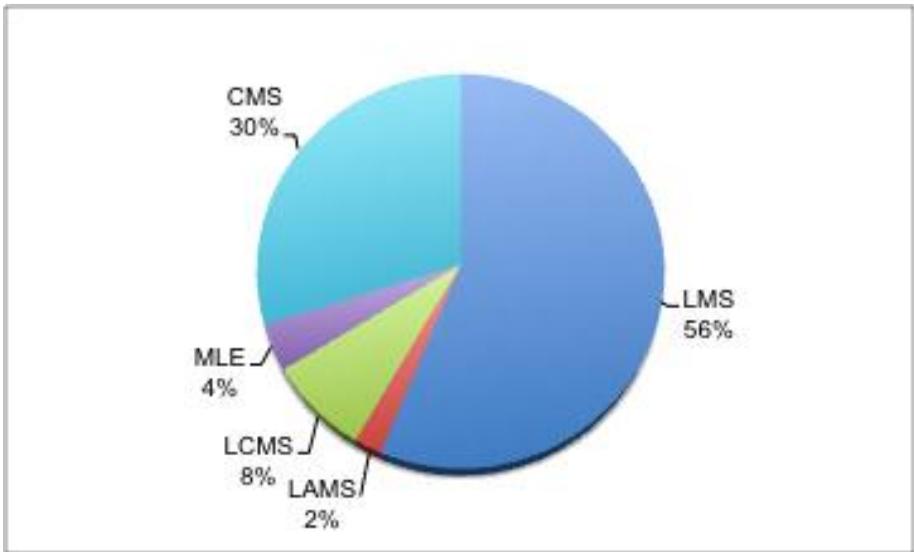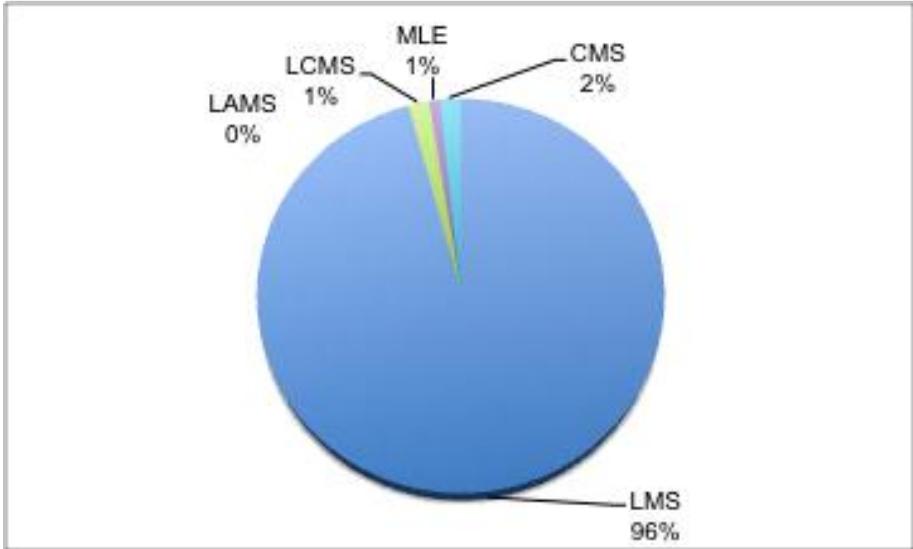

Figure 3 - Type 1 e-learning phrase usage (Google Scholar)

This same trend is even more pronounced when examining phrase usage within the journals, as depicted in Figure 4.

Figure 4 - Type 1 e-learning phrase usage (Journals)

In the journals 'Learning Management Systems' represents 96% of the Type 1 environment terminology. Again, this reinforces the view held by some researchers that 'Learning Management Systems' is the correct term, but that it is simply misapplied (Watson & Watson 2007).

Type 2 Term Usage

Figure 5 shows the distribution of the various Type 2 e-learning phrases from Google Scholar. As is clear from this chart, Virtual Learning Environments dominate the terminology.

However, in the review of the journals (Figure 6) while VLEs account for 21% of the term usage, OLEs account for 73%. As was mentioned earlier, this is largely as a result of the term 'online learning environments' being used to generically refer to any learning that takes place online rather than as a label for an e-learning environment.
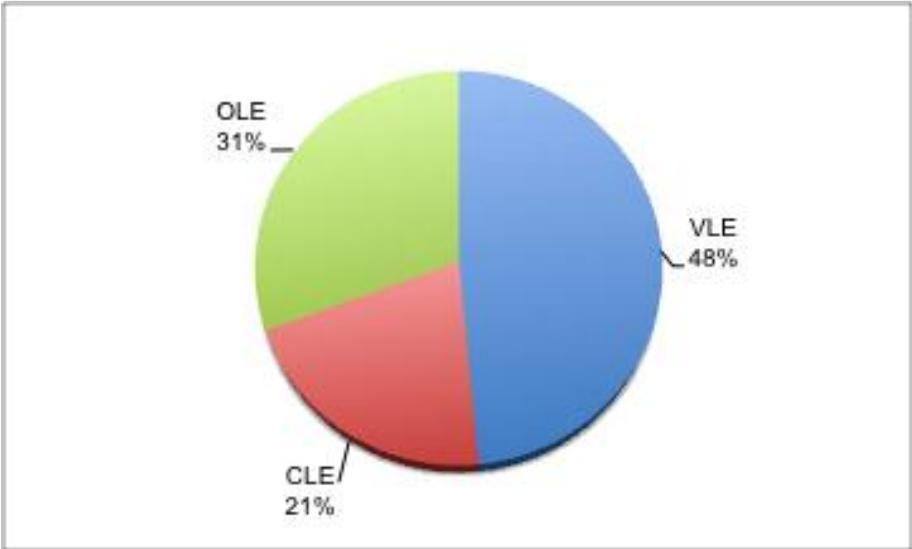
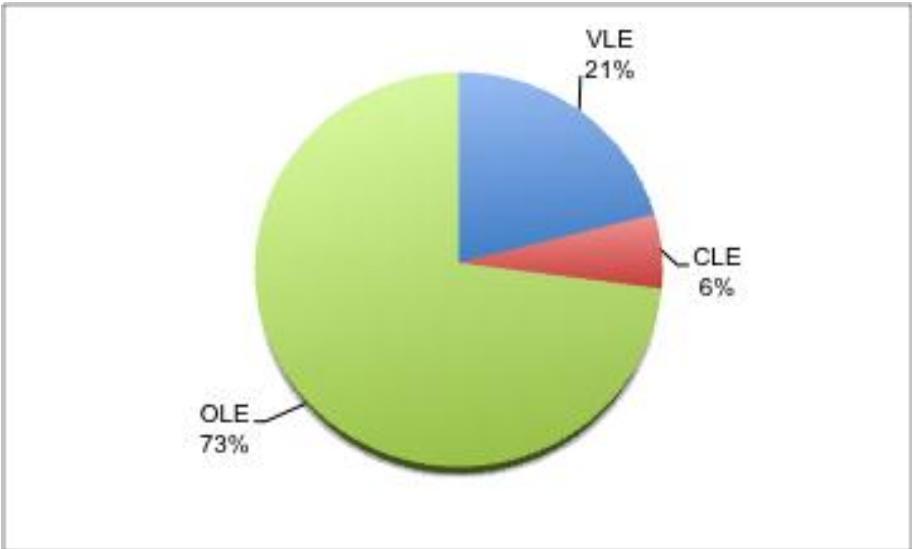**Figure 5 - Type 2 e-learning phrase usage (Google Scholar)**

Figure 6 - Type 2 e-learning phrase usage (Journals)

Type 3 Term Usage

While this research only includes the term 'Personal Learning Environments' in the Type 3 category, it may be argued that terms such as 'Mashups' or 'Mashup Environments' could also be included. However the difficulty with this is distinguishing learning environment mashups from other forms of mashups (social mashups, news mashups, etc.).

Another term that could be used is 'Personal Learning Systems'. This also suffers from a similar issue in that it can be used to refer to a variety of things including manual systems to assist people with learning. As such the predominant Type 3 phrase 'Personal Learning Environments' was used to signal Type 3 research. While it may not be prudent at this early stage of Type 3 environment usage to make predictions, the data does show a slight decline in research around Type 3 environments despite an initial interest in these environments.

Discussion

Having presented the results, this section now discusses these results in order to explore how the terminology has changed and what this may indicate about underlying pedagogical preferences.

The results show that the ten-year period, 2001-2010, saw a dominance of Type 1 terms, followed closely by Type 2, while the more recent Type 3 environments appear to have made little impact. While there are a wide range of terms that appear to etymologically share underlying epistemologies, one term dominates each type. Type 1 environments are dominated by the term 'Learning Management Systems', Type 2 environments by the term 'Virtual Learning Environments' and Type 3 by the term 'Personal Learning Environments'. A comparison of the usage of these three terms, as returned by Google Scholar, is depicted in Figure 7 below.

As with the overall comparison of Type 1, 2 and 3 shown in Figure 1, LMS (Type 1) has dominated although the past few years have seen a slight decrease in the usage of the term. Overall it appears that while 'Learning Management Systems' and associated Type 1 terms continue to dominate research, increasing critiques of the embedded pedagogies and implications associated with these environments are resulting in its decline (Mott 2010; Sclater 2008).
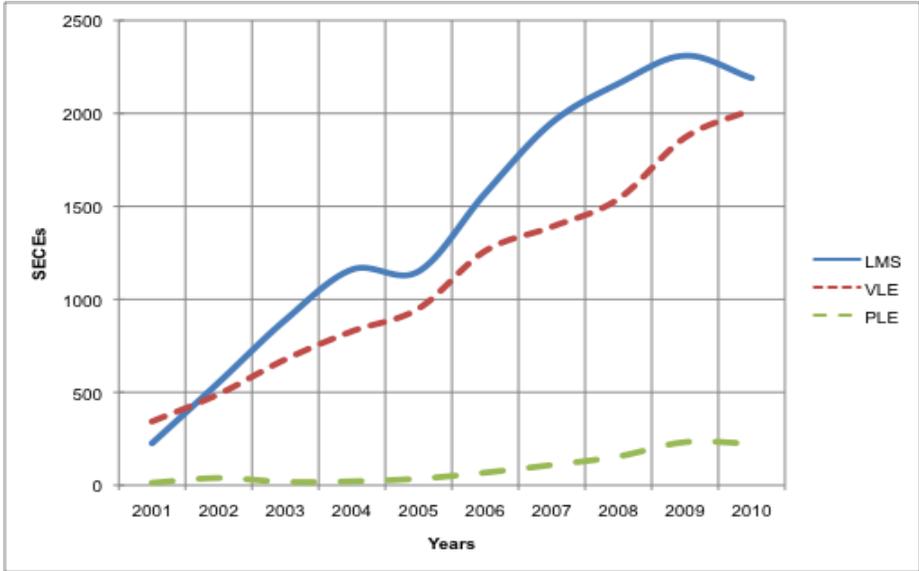
Figure 7 - Comparison of LMS, VLE, PLE (Google Scholar)

Research into Type 2 environments has consistently increased over the years, with the last few years seeing a continued increase in words associated with 'virtual', 'online', 'environment' etc. The term VLE (Type 2) is being used increasingly, and appears to be starting to replace the Type 1 term LMS. Wilson *et al.* (2008) suggest that terms such as VLE are more common in the UK, while LMS is more common in the USA. Future research could take a more country specific approach whereby results are categorised by country to see how the global trends are reflected by country.

Finally, Type 3 environments, with their focus on the personalisation of learning, and underlying Web 2.0 approaches appear to be floundering without having reached the levels of Type 1 and Type 2. PLEs had an initial growth but the last few years have seen a flattening/decline in research activity. Type 3 environments while offering a rich set of opportunities for student-driven learning appear to suffer from too many options, and too little control. These environments provide students with mashups through browsers or the ability to potentially customise learning spaces with any tools they want for learning. However this 'personalized' or 'customized'

approach is in contrast to the 'controlled' environments provided by hugely popular social networks like Facebook. Current Web 2.0 experiences appear to be leading towards less user customisation, and this may be reflected in the declining uptake of Type 3 environments.

The results show that despite the promise of Web 2.0 technologies and its ubiquitous use in many social and business areas, Type 3 environments continue to be 'marginalized, unsupported and even in some cases banned within educational institutions' (Wilson *et al.* 2008:1). Conversely, Type 1 production-focused environments continue to be the most widely researched e-learning environments.

So while there has been a dramatic shift in technologies from offline to online to online 2.0, there has only been a 'gradual move from pedagogies of consumption' (Type 1 and Type 2) 'to pedagogies of participation and production' (Type 3) (Dobozy & Reynolds 2010).

Determining the reasons for the continued prevalence of Type 1 environments, and to a lesser extent Type 2 environments, is beyond the scope of this paper. Reasons may include switching costs, technical support ability, existing Service Level Agreements, etc. However Rambe & Ng'ambi (2011) suggest that university administration needs drive the use of Type 1 environments. Wilson, *et al.* (2008) suggest that it may be because of the 'Dominant Design' concept. This concept describes 'the emergence of a broadly accepted core design principle from a number of competing incompatible alternatives' (Wilson *et al.* 2008:1). Examples include the inefficient QWERTY keyboard, the VHS video standard and the IBM PC. 'The primary characteristic of a dominant design is that, once it emerges, innovative activity is directed to improving the process by which the dominant design is delivered rather than exploring alternatives' (Wilson *et al.* 2008:1). In e-learning, Type 1, and to a lesser extent Type 2 environments, have exemplified this Dominant Design concept. 'LMSs have dominated the teaching and learning landscape in higher education for the past decade' (Mott 2010:1).

Conclusion

This research set out to examine academic literature relating to e-learning environments, in order to explain how the terminology associated with e-

learning environments changed. The results indicate that Type 1 environments, typified by Learning Management Systems, and their focus on content, production, and control, have dominated over the ten year period, with a slight decrease in the last few years. Type 2 environments, typified by Virtual Learning Environments, have been increasingly researched and appear to be close to eclipsing Type 1 environments. Type 3 environments, typified by Personal Learning Environments, despite resonating with current Web 2.0 technologies and student preferences for digital engagement, appear to be floundering in terms of current research agendas.

It is postulated that Type 1 environments and the associated 'industrial' nomenclature continue to dominate because of institutional imperatives and the acceptance of the dominant design exemplified by LMSs. 'The LMS has become a symbol of the status quo that supports administrative functions more effectively than teaching and learning activities' (Mott 2010:1). Additionaly this trend may also reflect a continued institutional alignment with instructivist pedagogies that are more closely aligned with 'organisation' and 'control' than those promoting 'exploration' and 'construction'.

However while e-learning environments that are more closely aligned with cognitivist and constructivist paradigms (Type 2, 3) appear to be receiving less research attention, students are increasingly engaging in informal learning within social spaces like Facebook and Twitter. These spaces are contrary to Type 1, 2 and 3 environments in many ways (Sclater 2008). As such a new Type 4 environment may arise in the future that is unlike previous formal e-learning spaces and more like current informal learning spaces found in social networks.

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