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# Mediators For Lecturer Perspectives On Learning Management Systems At Universities In The Western Cape, South Africa

Nhlanhla Mlitwa

*University of Cape Town, nmlitwa@gmail.com*

Jean-Paul Van Belle

*University of Cape Town, paul.vanbelle@uct.ac.za*

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# MEDIATORS FOR LECTURER PERSPECTIVES ON LEARNING MANAGEMENT SYSTEMS AT UNIVERSITIES IN THE WESTERN CAPE, SOUTH AFRICA

Nhlanhla Mlitwa, Department of Information Systems, University of Cape Town, South Africa, nmlitwa@gmail.com

Jean-Paul Van Belle, Department of Information Systems, University of Cape Town, South Africa, Jean-Paul.VanBelle@uct.ac.za

## Abstract

*This paper investigated the adoption of Course and Learning Management Systems (C/LMS) by lecturers at the four residential universities of South Africa's Western Cape province. To explain the differences in use patterns, a dedicated analysis framework, ActAD, grounded in activity theory was used. Lecturer interviews pointed to important differences in views – and consequent use patterns – of E-Learning and C/LMS. The key considerations were found to be differences in perceived usefulness, perceived ease of use, accessibility and functional expectations. This research not only shows how activity theory, and ActAD in particular, can be useful in understanding individual perspectives on and use of C/LMS, but also provides some useful comparative data to researchers in technology-based education.*

*Keywords: Course and Learning Management Systems; LMS; Activity Theory; E-Learning; Technology-Based Education; ActAD; Information Technology in Higher Education.*

## 1 INTRODUCTION

Educational technologies can be used to extend “human capabilities to solve problems” (McLuhan 1994), and to empower teachers and learners “to develop new knowledge and skills individually or collaboratively” (Liu and Hwang 2010) more effectively. Laurillard and Masterman (2009) identify the new “digital technologies” as providing a comprehensive electronic equivalence (and extension) of every educational invention that exists. An extension of conventional books into electronic books (e-books), and the extension of physical libraries, fixed classrooms, chalkboards, notebooks, pens and notebook, into electronic versions of digital libraries, e-classrooms, interactive whiteboards, pod-casts and web-casts, means that technology can now be harnessed to serve in every aspect of teaching and learning, in innovative and value-added ways (Laurillard and Masterman 2009). Much of this falls under the umbrella term of E-Learning: the use of electronic methods and tools to support, facilitate and enhance learning as well as knowledge-sharing beyond time and place constraints (Czerniewicz *et al.* 2007). This study focuses on the use of interactive course and learning management systems (C/LMS) to facilitate: teaching; learning; storage and exchange of various formats of data; flexible interactions between educators, learners and the educational context; the effective management of the course and to support other academic processes.

More specifically, this paper investigates the adoption of Course and Learning Management Systems at the four universities of South Africa’s Western Cape Province. The executive of all four residential universities have officially adopted and endorsed the introduction of C/LMS as a strategic institutional objective and committed significant resources to university-wide C/LMS implementations. However, the pattern of actual take-up by lecturers within different academic departments was very different across the four institutions. This prompted the authors to investigate which particular factors encouraged or inhibited individual lecturers from embracing C/LMS.

The focus was on individual lecturers’ take-up of C/LMS, not on the organisational formal adoption. It is clear that the enthusiasm – or lack thereof – of lecturers was not necessarily driven by objective technology factors but also encompassed subjective personal perceptions (Arbaugh *et al.* 2006). Thus the authors opted for an interpretivist approach. This approach is vindicated by the findings (see below) that the very same system (WebCT) was perceived as usable at one university and not at another. The theoretical framework that was used is Activity Theory. To this end, a dedicated analysis framework was developed, “ActAD”, to operationalize and contextualize Activity Theory within the context of educational activities and LMS at higher education institutions. This framework is discussed elsewhere in considerable detail (Mlitwa & Van Belle 2010).

## 2 THEORETICAL BACKGROUND AND ANALYSIS FRAMEWORK

After considering a number of theoretical frameworks, including Actor-Network Theory and Structuration Theory, Activity theory was finally used as the theoretical framework for analysis (Mursu *et al.* 2007; Kuutti 1998; Redmiles 2002). An analytical framework was developed (see Figure 1) which allows ActAD to be used to investigate the adoption of LMS within a HEI context (Mlitwa & Van Belle 2010).

According to Activity theory, an activity system comprises of a number of phenomena. Eight of these are singled out in formulating the ActAD activity framework as a concrete analytical tool. From an activity system based approach, e-Learning can be analysed as a teaching-learning work activity with an objective, mediators, actors, actions, mediator tensions, work activity as a transformation, and the activity outcomes. A more detailed discussion on the ActAD framework as operationalised in the context of LMS adoption is provided elsewhere (Mlitwa & Van Belle 2010).

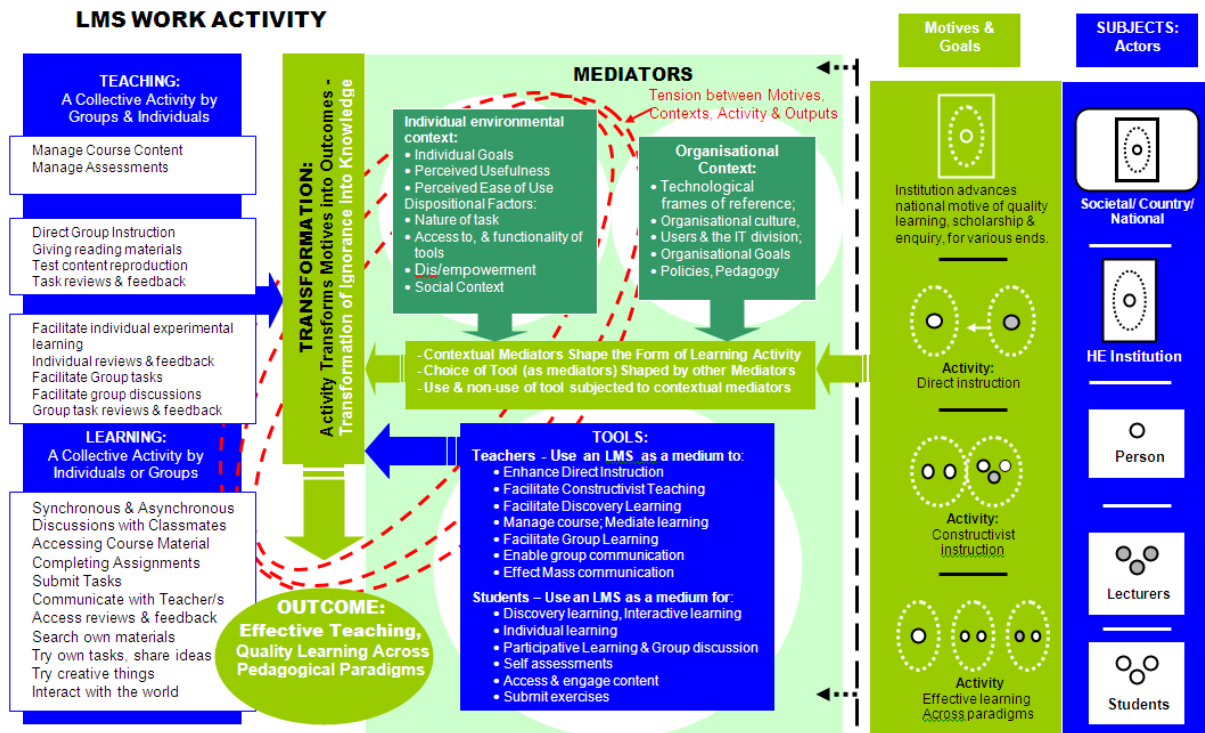


Figure 1. ActAD: An Activity Theory-based Framework for Analyzing LMS at HEIs.

Teaching and Learning through an LMS are seen as the key activity object in the framework. Interaction between teachers (teaching), learners, tools, mediators, and the actual learning process are the main activities in the context of this paper. In terms of the PU and PEU (Davies 1989), a teacher needs to believe in the usefulness of the tool as an enhancer of the work activity towards the object, and find the tool conveniently usable. However, studies by Mlitwa (2005), America (2006), Czerniewicz et al (2007), and Ncubekezi (2009) suggests that even positive perceptions about the usefulness of a system may not be enough to encourage usage of e-Learning tools. The nature of the task relative to the uses of the tool, the rules of its usage, as well as the social context further determine usage or non-usage of the system.

Rules, pedagogy, nature of tasks and social contexts are considered the most important mediators for the e-Learning Activity. The main actors in the system are the institution, the educators and the learners. The institutions, in these cases, view e-Learning as a system of interrelated and linked activities towards one common objective. At the same time, individual lecturers see a LMS as a tool to advance their individual goals. Space limits the discussion in this paper to the lecturer's perspective. However, the views from the other actors (institutions and students) were also gathered and analysed and will be reported on in a separate research report. Importantly, the *interplay* between various actors has also been found to be very important in both the creation of LMS perceptions and actual adoption (Martins and Kellermans, 2004). Further specific objects of investigation were conflicts, disempowerments and technical limitations as mediator tension. Throughout the research, work activity is viewed as a transformation i.e. to what extent the institutional goals – the university mission statement relating to teaching and learning – are enabled by LMS-driven teaching and the extent to which quality learning is seen as an outcome of this activity.

### 3 RESEARCH METHODOLOGY

As indicated, the underlying research paradigm is interpretivist. The framework used for data gathering and analysis was the activity theory derived ActAD framework.

The empirical dataset consists of the four medium-sized residential universities in the greater Cape Town area in the Western Cape, economically the second largest province in South Africa. From a

demographic perspective, these universities are quite representative of the higher education institutions of South Africa as a whole. The University of Cape Town is the top-ranked university in Africa on a number of international university rankings and the oldest university in South Africa. It can be seen as representative of the historically advantaged, traditionally English, white liberal research universities. The University of Stellenbosch is similarly a recognised, strong but smaller research university in a smaller town, but historically grounded strongly in the white Afrikaans tradition. The University of the Western Cape was established during the apartheid years to provide a home for the coloured students. It played a major activist role South Africa's struggle to become a democracy and has since embarked on a transformation process to move beyond being a teaching university to one engaging in relevant community research. It now has a student body which is much more representative of South Africa's population. Finally, the Cape Peninsula University of Technology arose from a merger of the two local technikons (tertiary non-university teaching-focussed institutions addressing the skill needs in commerce, engineering and technology) and is now a degree-granting University with a growing emphasis on post-graduate degrees.

This research project was grounded on several in-depth prior research projects which looked at the institutional contexts and motivations around e-Learning. For this particular research, twenty-one lecturers from a wide variety of departments from these four universities were interviewed over a period of about two years. A limitation of the study is that the nature of the discipline was not used explicitly as a variable in the model, even though research has shown that this may affect attitudes and adoption of LMS (Smith, Heindel & Torres-Ayala, 2008). However, a strong attempt was made to emphasize the 'softer' sciences in the sample to limit the discipline bias as much as possible. The objective was to have at least Political Studies and Information Systems represented, but that was not always achievable (e.g. U1 has no Political Studies, U2 has no Information Systems). Table 1 details the sample by discipline.

University	Number of lecturers interviewed	Subject disciplines
U1	6	Information Technology; e-Innovation Academy
U2	3 (*)	Political Studies; Dutch (language); Geology
U3	7	African Studies; Economics; Political Studies; Religious Studies; Information Systems and Management Studies
U4	5	Information Systems; Political Studies
(*) Access issues and bad timing resulted in a smaller than desired sample in U2.		

*Table 1. Interviewees by university and subject discipline.*

A detailed interview protocol was built around the ActAD framework, which suggests that e-Learning activities are determined by the interplay between environmental factors known as mediators. Sub-questions in the research instrument thus operationalised different factors that mediate e-Learning activities among learners and educators. That is, the dependant variables (i.e. C/LMS usage, non-usage, and whether the use facilitates different learning styles according to sound pedagogical practices) depend on the interplay between the enabling and inhibiting mediators. The mediating factors were categorised into three sets of variables: the social, the technical and the environmental factors. The social factors address the aspects of the individual actors, such as perceptual and peer influence (motivations), individual purposes and goals (intentions), computer-related experience and skill (capabilities), the actual activities for which a C/LMS is being used (activities), and related procedures. Questions were phrased so as to provide insight into the status of these factors, and their influence on usage or non-usage of a C/LMS by the educator. The same logic was applied to the technical and environmental (institutional) factors. These are translated into seventy sub-questions. The detailed interview protocol is available from the authors on request.

The interviews were recorded and transcribed. The main content analysis technique used was theme analysis: themes were identified, with a focus on the frequency with which any particular theme is presented and on how it is presented (Robson, 2002). The themes were then linked to outside variables – which, in the case of this study, are the mediators of C/LMS usage by educators.

Ethical clearance was obtained at the organisational level from all four participating universities. Individual ethical consent was sought from the participating lecturers. To keep the discussion neutral, names have been replaced: institutions are denoted by U1 to U4; individuals by referents such as T1 and quotes refer to particular passages or transcript annotations. However, it is acknowledged that the identity of the particular universities can be inferred from the contextual data provided.

## 4 DATA ANALYSIS AND FINDINGS

This section presents the initial data analysis and first level findings on the factors of C/LMS usage by lecturers in South Africa's Western Cape universities, based on interviews with 21 lecturers.

### 4.1 Lecturer Interpretations of e-Learning and Purposes of a C/LMS

Lecturers have varying conceptions on the meaning of e-Learning. Generally, a C/LMS is seen as an operational tool of doing e-Learning. In describing a C/LMS, perspectives range from the view of a Web-enabled platform to a 'thing' to do certain teaching, learning and communication tasks, an electronic classroom or as an interactive educational resource. It is also seen as a facilitator and a means of carrying out certain learning tasks online. Whilst a few academics describe a C/LMS as a means by which e-Learning is enabled, most educators appear not to distinguish between the terms 'e-Learning' and a 'C/LMS'.

Lecturers tend to use a C/LMS as a descriptive example of e-Learning. For example, a description of e-Learning as the use of an electronic system for teaching (U4, G1 – R2), or as an online mechanism to deliver learning (U4, T1 – R3) implies that e-Learning is both a process and a thing (implying a C/LMS). Predominantly, lecturers tend to describe e-Learning within the 'knowledge transfer' mode of instruction where 'learning is delivered' by a lecturer through the supply of lectures, 'notes, course outlines, slides... etc.' (U4, T1-R3) over an online medium. In describing his experience with the use of C/LMSs in e-Learning, for example, this lecturer (U4, T1-R3) refers to a C/LMS as a platform for content storage and access, as well as a communication medium. A C/LMS is also described as '... a place where students can get hold of your lectures, your slide shows, their tests, they can post stuff for you, you can post back, there is a discussion board where you can introduce topics... where they can discuss things...' (U1, C1-R16). Referring to the Vula system, another lecturer described this C/LMS as '... an interactive resource... like a type of intra-website where one can upload information, students can download information, there is a chat-room, there is a resource, students have access to the calendar... so it is a one-view sort of a place' (U2, N1 – R5). A description of a tool as an interactive intra-Website resource also highlights a Web-location with the flexible, 'anytime, anywhere' kind of access to resources, and a synchronous level of interaction.

Two things are notable in these descriptions. The first one is the omission of the word 'learning' in these accounts, which raises questions on whether learning is considered central to e-Learning and whether it is prioritised in the uses of C/LMSs. Secondly, these perceptions are function-based rather than pedagogy-focused. That is, the focus is on feature capabilities that in turn lead to an automatic reaction to somehow try and find uses for it, rather than to come with a clearly articulated pedagogical direction that requires a specific tool to implement. There is no indication that the meaning of learning and the effort to support different styles of learning is considered. With the current perceptions the likelihood, thus, is an inconsistent and compliance-type of system usage. It remains to be seen later in the findings how the uses of a C/LMS by lecturers co-relate to these perceptions.

### 4.2 How Lecturers Conceptualize C/LMS

Lecturers saw C/LMSs as vehicles to supply material and to convey information to learners. One lecturer even said '*... before Vula I used the Website and the general hard drive only to put materials for the students*' (U2, F1- R4). In the same light, another lecturer referred to a C/LMS as an information repository and access tool – where you '*put readings and references and so forth, onto VULA or on the Website... to access electronic versions of books or articles*' (U2, A1 – R4). Further, a lecturer from U1 said, '*I've been using web-Learning for a while, yes... as a place for students to*

access information on the site' (U1, M2 – R4). Similarly, a lecturer at U3 adds that '*putting all the materials onto WebCT is the main use... and then, reminders of test, and sometimes discussions on WebCT on the materials they work on in tutorials*' (U3, L1-R8), emphasising that she had '*not really used it beyond this...*' (U3, L1-R15). In fact, '*... all the lectures are presented in terms of the slide shows. Slide shows are also saved on WebCT for access by students, who make extensive use of them since they entail the summary of the lecture,*' (U3, W1-R4) explains a lecturer of business ethics at the U3.

A C/LMS is also seen as only a tool to do what you are already doing without it, with the emphasis on the fact that a C/LMS cannot transform bad teachers into good teachers. '*Can WebCT turn a bad teacher into a good teacher? I would say no, [U3, L1-R14], I would say that it is a useful tool, but... remember that we are still a contact university, so WebCT cannot replace a lecturer*' (U3, L1- R15).

### 4.3 Disputed relevance of a C/LMS to teaching and learning

In support of a content repository approach, several lecturers argue that a C/LMS cannot be a teaching tool. One lecturer at U1, for example, said he only uses a C/LMS to '*present information*', but '*not to teach*' (U1, J1- R9), adding that it is not a teaching instrument, but a teaching administration tool (U1, J1-R10). A professor of economics at U2 also voiced his doubts about the role of a C/LMS in teaching, saying that '*in terms of teaching, I have mixed views on it; in terms of administration, it can definitely be a time saver*' (U2, A1-R7).

Another lecturer even declared that he does not '*use it for anything else except just to upload notes for students... It does not affect how I teach*' (U2, F1-R9). Arguments are that teaching requires something more than what a C/LMS offers. Teaching '*takes engagement with a learner. It takes presence*', adding that his '*use of the C/LMS is limited, and is purely logistical*' (U2, K1 – R7). The feeling is that '*it does help to make some processes easier*' (U3, L1 – R14), but it cannot be claimed that teaching improves just because the slides are now on WebCT (U3, W1-R17), because '*the teaching rests with the teacher*' (U3, L1 – R14).

However, teaching and learning over an online platform extends beyond the narrow content repository notions to include the constructivist phenomena of mediation or facilitation, and guided learning as well as discovery and collaborative learning among other forms. Despite the abundance of scientific (and anecdotal) evidence to support the educational value (e.g. Koshmann 1996) of educational technology to facilitate teaching and learning, the facilitation phenomenon was also disputed by some lecturers. A C/LMS, for example, is considered '*...OK as a medium to remind people of things they already know, but not as a tool for learning new things*' (U1, J1-R10). Reasons are that it is a human-made, non-cognitive artefact that can only offer artificial and pre-programmed solutions (ibid.).

### 4.4 On the use and perceived usefulness of a C/LMS

As an instruction delivery medium, a C/LMS can help universities to deliver their offerings to larger numbers of students, offering a potential for universities to even increase their student intake. It improves efficiencies and it offers an opportunity for contact universities to increase student intake.

#### 4.4.1 Usage and usefulness of WebCT/Blackboard at U1

Information on the uptake and use of WebCT at U1 was misleadingly questionable and of unreliable use. With regard to the perceptions on C/LMS usefulness, U1 lecturers believe in the usefulness of a C/LMS at a conceptual level. Practically, they cannot fully exploit the perceived usefulness – due to extreme technical failures. One lecturer, for example, states that '*if it works it is fantastic!*' (U1, C1 – R15). Whilst '*WebCT makes it relatively easy to present stuff to students in a fairly structured way*' (U1, J1 – R6), '*the problem is that it never works, at least not consistently*' (U1, I1 – R6). As a result, usefulness is inhibited. The fact that '*at half the time you cannot get on it reliably, so there seems to be no point in starting something that you know students are going to struggle with – not from a content point of view but from an access point of view*' adds one of many frustrated lecturers who had to limit their use of the system as a result (U1, J1 – R10).

Even in times when it (WebCT) works, its procedures are time-consuming. It is not user-friendly. It is technically slow, and is not logically developed (U1, M2 – R17). The difficulty according to the lecturers is that the current WebCT and Blackboard system does not *‘take into account the intricacies of how humans think... it can be quiet rigid’* (U1, C1-R16). For example, *‘sometimes you want to do three things, but you can’t do all three at the same time. You cannot load three files all at once. You have to go back, and you cannot just go back by, say one page back, but three pages back and then load something again’* (U1, C1-R11).

#### 4.4.2 Usage and usefulness of VULA at U2

Uptake and usage of Vula has grown significantly since its inception in 2006 at U2. In effect, the total number of sites created on Vula grew from 191 in 2006 to 1 546, with a total of 155 051 non-distinct users in 2009 (Marquard, 2010). By the end of 2009 an average of 21 347 students (88% of the 24 393 registered student population in 2009) was using Vula at U2 (ibid.). The number of active staff and guest users has also been growing phenomenally since 2006.

In addition to the high growth rate of usage, lecturers have positive perceptions on the usefulness of Vula in education. For most lecturers *‘it is very helpful to be able to put readings and references and so forth, onto VULA or on the Website’* (U2, A1-R4), and *‘it makes it very easy to communicate with students and for them to communicate with you...’* (U2, J1 – R9). The advantage of using turn-it-in software to check plagiarism is mentioned among logistical benefits (U2, A1-R6). A 25-year-old lecturer in the Department of Management Studies captures the impression of her colleagues at U2: *‘I just find it exceptionally useful for tutorial sign-ups, for creating groups, and for communication. In general as far as I know, most lecturers do make use of it now – just because it is so easy’* (U2, F1 – R11). A lecturer in the Department of Political Studies adds that it makes him more accessible to the student, saying *‘...they can communicate with me very, very easily’*, adding that he had received more communication and more comments from the students now than in the years preceding the use of VULA (U2, J1 – R14).

#### 4.4.3 Usage and usefulness of WebStudies at U3

An average of 13 818 undergraduate students or 96% of the total of 14 323 registered students across the ten academic faculties had at least one module on a C/LMS at the U3 in 2006 (CTL, 2008). The figure was 94.7% – or 13 999 out of 14 770 students in 2007. The number grew to 97% in 2008, with 14 556 of the 14 934 registered undergraduate students having at least one module on Webstudies in 2008 (ibid.).

Lecturers at the U3 also find their ‘WebStudies’ C/LMS (updated version of WebCT) useful, mostly for purposes of storing content, communication, and for assignment submission (U3, W1-R5; U3, L1 – R6). To this end a respondent with more than 30 years of teaching experience elaborated: *‘I find it to be a very easy way to communicate with students. It also opens up certain possibilities, but mostly, improves my communication with students... it made it possible for me to give students access to articles to study materials that I would otherwise send them to the library for’* (U3, L1-R7).

#### 4.4.4 Usage and usefulness of KEWL at U4

Statistics on the uptake and use of KEWL were not available at U4. Internal sources doubted if that sort of data is being kept or preserved in the institutions. With respect to the perceptions on the usefulness of KEWL, lecturer perspectives on the usefulness of a C/LMS are mixed in this institution. They range between positive conceptual beliefs and limitations in practical experience. On the positive aspects, KEWL just *‘makes it so much easier for lecturers and students to put what can be put on the e-Learning site for accessibility at anytime and from anywhere where there is an internet connection’* (U4, Z1 –R3). It saves costs as you do not need to print things, and it helps in keeping records (U4, T1-R14). It is also considered *‘pretty straight forward’* and *‘very easy, you log-in you can download some stuff. It also has some interactivity’* (U4, Z1 – R12), with the strong point being *‘the flexibility that it affords you, if you have internet access’* (U4, Z1-R18).



Citing resource limitations for students, a senior lecturer in the Department of Information Systems complains that they have *'not been very successful at getting the universal access for all students on the e-Learning system'*, hence, *'usage has been quite limited... that has tended to diminish the value of... the e-Learning work space as a mechanism for disseminating and sharing knowledge'* (U4, G1 – R3). Lecturers and students are in agreement about this problem at U4. The lecturer further complains about the usability of the system, citing administrative procedures such the registration of students as being inefficient and burdensome. *'Apparently,'* adds the respondent, *'I need to send the list of the students to someone in e-Learning so that they can all have access on the course. And then I have to do this for every module of the course... and there are seven modules in it. So, it does not link the course together and I have to repeat this exercise for all seven modules. So, for the value that I'm getting out of it, it hardly seems worth it. What I would recommend? Simplifying processes, and make it more user friendly'* (U4, G1 – R5). Immediately the lecturer expresses an indifferent attitude, saying in his explanation that *'because I have not seen anything to be excited about on this e-Learning system'* (U4, G1 – R8) *'it does not make a difference'* (U4, G1 – R9). This frustration is shared by many lecturers at U4.

#### 4.5 Common Perceptions across Institutions

On the benefits that a C/LMS has for students, lecturers seem to agree on the convenience and flexibility of access to materials (U2, H1-R8; U1, C1-R18; U3, L1-R16). A C/LMS simplifies logistical processes for lecturers, and *'students can view their marks... as soon as you finish marking you can make it available for students to view at any time'* (U4, T1 – R14). On self-assessments with automated feedback, students can also gauge their levels of understanding, thus highlighting areas that require additional attention, at their time, space and pace (U1, W1-R19).

The general thinking is that a C/LMS makes it easier, and maybe easier than it should be, for students to search and access learning materials (U2, H1-R11; U3, L1-R7). However, lecturers are not without concerns, with fears that a C/LMS threatens to render the lecturer and the traditional classroom redundant, being raised both at U2 and U1. Whilst it is considered useful logistically, lecturers are wary that a C/LMS could end up replacing their roles as educators. A lecturer, according to one concerned 50-year-old educator, *'... is in a sense running a risk today – of being redundant; why should a student come and listen to me when they can listen to the best economist in the world, just by turning on their computer? Why should I be the person setting their assignments whilst the person who wrote their text book could be perhaps setting their assignments... I may well end up as a person who turns the machine on in the morning or downloads stuff from the Web to pass on to my students. The university itself, as an institution, is under threat'* (U2, A1-R8). Since his computer literacy is limited, this educator uses Vula indirectly through his tutors – hence his sceptical view on computer systems.

Further concerns are that a C/LMS *'is changing the way students are consuming information ... there is much higher demand of having everything ready at the click of the button... whereas before, they were kind of happy if there were enough handouts at reception... Now you find students are too demanding, and are really helpless in terms of finding information'* (U2, N1 – R12). The concern is that *'at times it [a C/LMS] makes them to just stop thinking because everything is available, and you think, well, if I don't know it, I'll google it... and ... there is now this uncritical consumption of information and I know of some lecturers who say, at the end of the day I want them to go to the library and read up'* (U2, N1 – R23).

A C/LMS also encourages students to rely on given content, rather than to use their ability to search for and find their own sources. In the words of a U3 lecturer, for example, a C/LMS tends to *'make the students lazy... because they no longer know how to use the library properly, they don't learn the skill of really searching for materials in the library'* (U3, L1-R7). It is also feared that a C/LMS may be encouraging students stay away from classes. Emphasising this concern, a 25-year-old management lecturer said, *'We are a physical, face-to-face university...'* and *'we want students to attend classes'* (U2, N1 – R32). So, *'... if they should stop attending lectures, that will be a problem,*

because some simply think that they can access these things on VULA and not come to their lectures’ (U2, H1 – R11), adds a senior lecturer within the humanities faculty.

## 5 EXPLANATIONS: MEDIATORS OF USAGE/NONE- USAGE

The section above shows that the highest level of C/LMS usage by lecturers is at U3, followed by U2 with high, but not universal, usage. The findings also show limited patterns of C/LMS usage at U1 and U4, for various reasons though predominantly because of IT infrastructural limitations. According to the work-activity analytical framework, actors in activity system carry out activities with a goal or purpose in mind. Further, the success or failure of an activity, and ultimately the realisation of the end goal, is shaped by contextual factors called the mediators. As shown in figure 1, mediators may either be the enablers or inhibitors of a work activity and goal realisation. This section draws on this notion of mediators to explain the patterns of C/LMS usage in sampled universities.

Content repository, communication and assignment management functions are the frequently cited purposes of usage in sampled universities. Explanations to C/LMS usage (or non-usage) patterns by lecturers are presented in Table 2.

Mediator:	U1	U2	U3	U4
Perceived Usefulness	+	+	+	+
Perceived Ease of Use	-	+	+	+
Accessibility	-	±	+	-
Functions as Expected	-	+	+	+
Education and Information Support	-	±	+	±
Usage Mediation	±	±	±	±
Legend: + enabling; - disabling; ± mixed				

Table 2. Mediators of C/LMS Usage at U1, U2, U3, and U4

There appears to be a unanimous belief in the usefulness of C/LMSs among lecturers. Goals of usage among all lecturers, however, are limited to content storage and retrieval as well as communication. The value of a C/LMS from this perspective is its capacity to let you do more with less (U2, A1-R8; U4, T1- R5). Viewed in this manner, an objective or goal, rather than pedagogical focus is implied, a view which confirms students’ claims that usage depends on the subjective goals of the lecturer.

However, a goal that is purely logistical, with no attempt to facilitate different styles of learning, ignores learning (and the needs of the main beneficiary of e-Learning) which is the core of C/LMS usage. Such a stance is strongly challenged in this thesis. Table is elaborated in detail in the following sections.

### 5.1 C/LMS usage mediators at U1

Students and lecturers describe the WebCT Blackboard system as well written (U1, J1-R8), but practically difficult to put into use. It is not ‘an easy system to figure out and use’ (U1, C1-R8) even if you are computer literate. Usability is limited and ‘it is not intuitive’ (ibid.); for example, ‘there are so many things that if you get wrong, you can’t fix it but had to do it all over again’ (U1, C1-R8).

The network capacity seems inadequate, and the technical support is under-capacitated (U1, J1-R10). Explanations, according to most lecturers, are that ‘the network people are not talking to the e-Learning people. If you experience technical difficulties and you contact the e-Learning people you will be told that it is a network problem and you should contact the network people. The network people will also tell you something else, so, the problem keeps going on year-in year out’ (U1, J1 – R17).

In addition to technical limitation, lecturers and students can only use the system if they see the need and the appropriateness of the system to address that need. In this particular case, ‘it seemed that they just did not see the need. If they don’t feel the need, then why push it...’ (ibid.). To support this point, one lecturer explains why he is not using the assessment feature of WebCT, saying that ‘things like online examination, etc, are great for say, first to second year multiple choice questions, [but] at our

*level...we tend to ask more explanatory essay type questions...'* hence, *'that mode of use is not of much use...'* (U1, J1-R10).

Therefore, limited infrastructure capacity, inadequate coordination of networked systems and limited technical support are the negative mediators (inhibitors) of C/LMS usage by learners and educators at U1. Hence trust and confidence in the appropriateness of WebCT in affected campuses and departments at U1 is minimal.

## **5.2 C/LMS usage mediators at U2**

U2 lecturers perceive the C/LMS to be useful (PU) and very easy to use (PEOU). Additional mediators are that the Vula designers avoided unnecessary complexities in the interface, by keeping it as simple as possible and only including features that are needed in the institution. The helpdesk service is professional and efficient. The coordination of the C/LMS with the e-mail services helps users know when there is a new task that needs their attention, so they can log-on to Vula. In addition, the coordination of Vula with students' records eliminates tedious administrative tasks for lecturers. For example, students who are registered for courses in the central records department are automatically registered into courses on Vula, which means lecturers do not need to enrol individual students into their courses. Availability of lecturer assistants and the tutorial system also helps the lecturers make better use of the system, whilst not compromising other academic responsibilities.

The faculty of science, however, is lagging behind. Lecturers are considered unwilling, system usage is not promoted or supported, computers in the science labs that are in poor working condition, relevant software programs are lacking, and unhelpful lab staff hinder the use of computer facilities in the science faculty. This situation is in direct contrast to developments in other faculties.

## **5.3 C/LMS usage mediators at U3**

All sampled lecturers at the University of U3 perceive the C/LMS to be useful for content storage and distribution, and for flexible communication with students. Lecturers find the WebStudies platform to be adequately supported at the university. Students have easy access to computer facilities 24 hours a day, and since computer laboratories are professionally managed, with qualified teams of support staff who look after facilities and support learners when they have problems, computers are always functioning optimally. Not only do every department and almost every building have a large computer facility, but also university hostel rooms have network lines installed to enable students with personal computers to connect to the Internet from their own rooms. Lecturers also find the helpdesk facility to be very professional and efficient. In case of a technical failure, argues one lecturer, the technical support person would even log-in to your computer remotely and fix it directly from his office, and the WebStudies (e-Learning) division is always very supportive (U3, W1– R14). They see to it that lecturers are registered into WebStudies, and all students are automatically registered into the C/LMS as soon as they are centrally enrolled for the course (U3, M1–R1).

Whilst the environment is fully supportive and the system is user-friendly, lecturers are still not using the C/LMS for purposes other than content repository and for communication. Despite the supportive environment, lecturers say that preparing for online presence can be time consuming (U3, L1 – R8). Using a C/LMS for purposes other than content storage or communication, thus, would need more time than they have, given their other research and lecturing responsibilities (U3, L1 – R10). The belief is that a C/LMS is a mere support tool that should not be used to replace lecturers in contact universities. C/LMS usage therefore, should be optional and purpose-driven. Whilst lecturers do not feel pressurised to comply with the online presence principle of the e-Kampus policy, the policy does influence usage patterns indirectly (U3, S1 – R6; U3, L1 – R13).

## **5.4 C/LMS usage mediators at U4**

Whilst all interviewed lecturers believe in the usefulness of C/LMS, they all admit to be using it extremely minimally (U4, G1 –R3). All lecturers in a U4 sample were using their KEWL system to provide notes. Computer-literate lecturers also find the KEWL NextGen system easy to use (U4, T1 – R28, R29). Lecturers with limited computer literacy, however, think the training offered by the e-

Learning division is artificial and often confusing. One lecturer, who is also the head of department, explains, for example, the frustrations that he and his colleagues have had with the KEWL training sessions. The lecturer (U4, K1 – R9.2) says that ‘lecturers would go to some venue to attend the training. When you get there, the monitors are not up, or have an inappropriate software, etc...’ The lecturer (U4, K1 – 9.4) further complains of ill-founded assumptions by instructors that ‘whatever is the latest buzz-jargon of this year is already known to all the academic staff members’.

Technical instability and inefficient support are seen as limitations (inhibitors) to lecturer usage of KEWL at U4. In terms of poor helpdesk service the lecturer says: ‘... these departments close at 16h30pm, and we are lecturing until 20h00 pm... When a problem happens at 4 or 5 pm on Friday, nothing can be done until Monday’ (ibid.). One lecturer complains about the tedious processes that have to be followed in order to get students registered on the system, saying... ‘Apparently, I need to send the list of the students to someone in e-Learning so that they can all have access on the course. And then I have to do this for every module of the course. Now I am only doing one course and there are seven modules in it. So, it does not link the course together and I have to repeat this exercise for all seven modules. So, for the value that I’m getting out of it, it hardly seems worth it. What I would recommend? Simplifying processes, and make it more user friendly’ (U4, G1 – R5).

Technical inconsistency, limited technical support, and resistance to change on the part of reluctant colleagues play a negative mediation (inhibiting) role in this institution.

## 6 SOME ADDITIONAL FINDINGS

The ActAD framework suggests that, whilst usage of a C/LMS is influenced by positive mediators, poor usage is an outcome of a negative interplay between the actors, activities and the mediating factors. The presence of the positive mediators of usage at U2 and U3 is supported by positive patterns of C/LMS usage in these institutions. Similarly, there are limitations in these factors at U1 and U4 with poor C/LMS patterns. However, there are similarities in lecturer perceptions about the usefulness of a C/LMS across the four institutions. That is, there is a mixture of positive and negative perceptions across all four universities. Therefore, differences in circumstances and similarities in perceptions necessitate a further scrutiny for a deeper insight into the subject.

The goal of a collective work activity in the e-Learning activity system is not only dependent upon the presence or absence of mediators. The ActAD framework further suggests that the work process should take place. The work process includes an object of the activity, ‘a transformation towards an outcome, and the outcome’ (Mursu *et al.* 2007: 7). The object is more than just the changing of one thing into something different. It is a purposeful undertaking by the actors to create a transformation process towards achieving the intended outcome (ibid.). An actor has a goal, tools, colleagues and rules when he/she is working on transforming an activity into the intended outcome, hence the activity system is understood as a collective set of activities carried out to achieve a common purpose.

Given the systematic nature of the activity system, a relative fit between the elements of a work activity is assumed (Engeström 1987). This relative fit is termed the ‘mode of operation’ which, as the activity advances in its transformation towards the intended outcome, goes through imbalances and contradictions within an actor, and between actors. Contradictions are temporary and they are necessary because, as they are addressed, the work activities and the transformation process are strengthened, which in turn leads to a better outcome (ibid.). The transformation process, therefore, is not immune to mediator influences, and it is certainly not immune to multiple contradictions.

### 6.1 Same C/LMS but contradictory outcomes in two institutions

Interestingly, with respect to system usability, the same C/LMS (WebCT) has inhibiting functionality failures in one institution (U1), but works efficiently in another university (U3). For example, setting or even invigilating tests on WebCT is described as disastrous at U1, because the system could fail at any moment (U1, M1–R4). It is also described as ‘not easy to use’ (U1, CU – R8), and that the

response time can be very slow (U1, C1-R11 and CR-R30). On the contrary, U3 lecturers describe the same system as ‘quite simple’ and ‘user friendly’, though ‘Like any other system, you must first learn and familiarize yourself a bit, but after that it is relatively easy to use’ (U3, W1-R8). It is also seen as ‘...a very easy way to communicate with students. It also opens up certain possibilities, but mostly, improves my communication with students’ (U3, L1 – R6).

This observation demonstrates an element of doubt to normative assertions by lecturers at U1 that the problem is system based, simply because of different experiences at U3. On closer examination, however, the annual report of the U3 e-Learning administrative unit, the Center for Teaching and Learning (CTL 2009) that more than 5 179 function related queries were lodged to the support unit over the 2009 academic year. Therefore, it is logical to explain positive user experiences of WebStudies to sound prevention and efficient damage control measures by the implementing unit and the network support (helpdesk) teams, rather than a problem-free system. The statements that the IT helpline at U3 University is impressive, and that ‘you just phone through’ and use ‘remote access’ to work on your computer, fixing the problem fast’ (U3, W1-R14), supports this argument.

The argument in the introductory part of this section is that the transformation process under the ActAD framework is not immune to negative mediation as well. Whilst other actors with the e-Learning activity system only have to deal with access issues, matters of resistance to change and literacy limitations, institutions and users with troubled network systems and poor user support are more hindered from transforming their goals into desired e-Learning outcomes. A lesson for the negatively affected universities is that, until an inefficient system can be replaced, it is possible to control defects through sound management and efficient user-support initiatives.

## 6.2 Disagreements on C/LMS relevance to teaching

A second important note is that lecturers tend to agree on C/LMS usefulness, but disagree on the detail of usefulness and on the relevance of the system to teaching (and learning). All 21 interviewees state that a C/LMS is important, with one side of the spectrum supporting the usefulness of the system to teaching and learning, whilst others viewing a C/LMS as an important logistical tool.

Pedagogy assertions differ between lecturers within institutions. Different lecturers make indirect inferences to the behaviourist, and to the constructivist modes of instruction, in their assertions about e-Learning. Behaviourist sentiments include descriptions of the preferred uses of a C/LMS, either as a ‘*place where students can get hold of your lectures, your slide shows, their tests, they can post stuff for you, you can post back...*’ (U1, C1-R16), or a ‘*good interface between an academic and a student/s... to present stuff that they need to know in a fairly structured way*’ (U1, J1 – R8). A C/LMS is also seen as a means ‘*to give students access to articles and study materials that one would otherwise send them to the library*’ (U3, L1-R7), or in the case of U2 lecturers, ‘*to put readings and references and so forth, onto VULA or on the Website*’ (U2, A1 – R4).

On the constructivist front, lecturers argue that students cannot ‘*just understand and grow wiser, by just looking at the materials*’ (U2, K1 – R6), and that it is not ‘*about imparting facts and more information. To try and get students to understand and be sensitised about concepts, takes a lot of effort on the part of the lecturer*’ (U2, K1 – R7). Others emphasise a need for flexibility, where a learner is able to learn as they go, with one lecturer characterising C/LMSs that are not integrated with Web2.0 multimedia and mobile technologies as inadequate (U1, M2 – R14).

In the light of different pedagogical stances, C/LMS usage patterns can be expected to follow different pedagogical stances. A contraction in this instance, however, is that C/LMS usage patterns by lecturers are predominantly similar. That is, all 21 lecturers in the sample, from both ends of this pedagogical debate, are using WebCT (U1), Vula (U2), WebStudies (U3) and KEWL (U4), to present notes and to communicate with their students. This paradox is typical of what Laurillard (2008) refers to as shortsightedness in teachers and lecturers’ conception and view of ‘computer assisted learning’. A common mistake is that educators are looking at technology first, in a sort of ‘I have technology, therefore I must use it’ sort of sense. The temptation then is to look at what a technology has (in terms of the features) and try to find something for which it may be used in education. This way, lecturers end up complying with a technology rather than to get to the core of e-Learning, which is to support

learners to learn. In the ActAD, ‘object-transformation’ sense, resultant e-Learning activities would fail to transform the goal of the process, into an outcome. If learning is at the centre of e-Learning processes, then the use of a C/LMS tool should yield a transformation of e-Learning activities, into desired outcome.

## 7 CONCLUSION

This paper investigated the adoption of Course and Learning Management Systems at the four universities of South Africa’s Western Cape. All four residential universities had officially adopted and endorsed the introduction of C/LMS as a strategic institutional objective and committed significant resources to university-wide C/LMS implementations. However, the pattern of actual take-up by lecturers within academic departments was very different across the four institutions. This prompted the authors to investigate which particular factors encouraged or inhibited individual lecturers from embracing C/LMS. The theoretical framework is grounded in Activity Theory. A dedicated analysis framework was developed, “ActAD”, to operationalize and contextualize Activity Theory within the context of educational activities and LMS at higher education institutions.

After interviewing 21 lecturers, it was found that most educators appear not to distinguish between the terms ‘e-Learning’ and a ‘C/LMS’. C/LMS are conceptualized mainly as delivery tools to deliver resources such as learning materials and course-related information to learners. The pedagogic role of C/LMS is hardly ever recognized; the possibility of using C/LMS to address different learning styles and teaching paradigms is not explored by lecturers.

The actual uptake of C/LMS differs substantially across and within institutions, despite the fact that all four Universities made a strong organisational commitment to e-Learning. At two universities, the individual lecturer uptake was relatively low; whereas at the other two universities, the lecturer adoption was almost universal. Although lecturers agree on the convenience which a C/LMS can bring to make access to learning materials easier, there are also concerns about possible shifts in their role as educators and classroom lectures. Lecturers are also aware of changes in student learning approaches: students may become passive consumers of information – sometimes quite uncritically – instead of actively seeking and evaluating information sources.

To explain the difference in use patterns across lecturers, six mediators were identified to influence C/LMS usage: perceived usefulness, perceived ease of use, accessibility, functional expectations, support and use mediation. The ActAD framework was able to explain some apparent contradictions, such as the fact that the same C/LMS (WebCT) meets with different perceptions and use patterns in two different institutions, demonstrating clearly that IS researchers should seek explanations beyond the technical artifact. Another contradiction is that lectures profess using different pedagogies (the behaviourist versus the constructionists) yet their actual C/LMS use appears strikingly similar and relatively restricted to a purely functional view of C/LMS.

Hopefully this research serves as an empirical illustration of the usefulness of the ActAD framework to apply Activity Theory in the context of e-Learning technologies at higher education institutions. The actual findings show how subtle the mediating effects can be where individual actors (lecturers) do not necessarily align themselves with organisational strategies. It is hoped that other researchers will find other uses for the ActAD framework and be able to use some of the concrete empirical findings as comparative data for their own research in e-Learning and C/LMS adoption.

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