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Student and Staff Perceptions of a Learning Management System for Blended Learning in Teacher Education

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Abstract: Higher education institutions routinely use Learning Management Systems (LMS) for multiple purposes; to organise coursework and assessment, to facilitate staff and student interactions, and to act as repositories of learning objects. The analysis reported here involves staff (n=46) and student (n=470) responses to surveys as well as data collected in interviews and focus groups. The research focuses on participants' perceptions of two broad affordances of the LMS: accessibility and interactivity. Differences were found between student and staff views in relation to accessibility of online materials, with students rating its contribution to their learning more highly than staff. However, the two groups held similar views with regards to the effectiveness of LMS tools to enable interactivity. Applying interaction equivalency theory (Anderson, 2003), the results reveal the importance of the key choices made by teaching staff in deciding which LMS tools to use in order to maximise student participation and learning.

Learning Management Systems in Higher Education

In recent years the tools available for teaching in university settings have changed dramatically from chalk, blackboards and overhead projectors to learning management systems (LMS). LMS are now commonplace in higher education for both on-campus and distance students and are broadly defined as information systems that facilitate e-learning by supporting teaching and learning, but that also can perform administrative tasks and facilitate communication between instructors and students (Klobas & McGill, 2010). However, the corpus of literature dedicated to understanding how its use impacts on pedagogical practices in higher education is still under development (Beetham & Sharpe, 2013; Herrington, Reeves, & Oliver, 2005; Renzi, 2011). LMS structures have also been criticised for being too instructor-centric because they primarily seem to enable teachers to increase their efficiency in dealing with student assignments and feedback, distribution of teaching resources and various administrative tasks (Mott & Wiley, 2009; Weaver, Spratt, & Nair, 2008). More recently, LMS have started to incorporate interactive tools such as blogs, wikis, chat rooms and discussion tools; features which have the potential to facilitate constructivist approaches to learning in contrast to traditional transmission models (Lonn & Teasley, 2009). Rubin et al. (2009) state that at a minimum an effective LMS “must support active engagement, meaningful connections between segments of the course, easy communication, and formative feedback on work that is presented in class discussions or through other venues” (p. 82). However, for interactivity of this type to occur, so that LMS are used to enhance the learning

process rather than simply information transfer, both staff and students need to perceive value in participating in these collaborative components.

Research matching student and staff perceptions of LMS features has been sparse. Some authors claim that there is evidence that students generally have a more positive view than staff (Palmer & Holt, 2014), although it might be “simplistic to portray staff as resistant to using new technologies and younger students as more likely to embrace them” (Waycott, Bennett, Kennedy, Dalgarno, & Gray, 2010, p. 1209). However, other research indicates that staff view the learning benefits of LMS more positively than students, with students seemingly more interested in *how* LMS features are used rather than *whether* they are used (Lonn & Teasley, 2009). Students have also been found to appreciate the accessibility to course resources afforded by LMS and the features which allow interaction with other course participants (Heirdsfield, Walker, Tambyah, & Beutel, 2011; Rowley & O’Dea, 2014). Heirdsfield et al. (2011) found that staff were generally less positive about the interactive features of LMS than were students (Zanjani, Nykvist, & Geva, 2012). Others examining this conundrum have proposed that staff generally view the interactive elements of LMS as being too time consuming (Jurado, 2012).

One of the fundamental roles of LMS in higher education is to enable connections and interactions between three constituents: students, teachers and content. The importance of these exchanges can be understood and emphasised by interaction equivalency theory (Anderson, 2003; Miyazoe & Anderson, 2010) which posits that high levels of student satisfaction can occur when any one of the following types of interactivity are high: student-student, student-teacher, student-content. In other words, if only one of these interaction types is high, it can compensate to some extent for the absence or low levels of the other two types of interactions. In blended learning contexts, some of these interactions may occur online within the LMS, while others may occur face to face, implying that instructors need to consider each course of learning in totality when planning and implementing LMS use within their courses.

Zanjani, Nykvist, and Shlomo (2013) in a review of the literature related to effective LMS, reveal that multiple factors must be considered in developing an effective LMS experience. They find that consideration must be given to the computer skills and knowledge of both teachers and students, and to the perceived usefulness that students ascribe to LMS features. Also, they find that LMS design in terms of ease of navigation is important, as are the learning materials that are used within the LMS. Finally, they mention that it is imperative for timely external support to be available in the form of troubleshooting and network reliability. All of these factors, if carefully accommodated can contribute to a successful course experience for students and staff, mediated through an LMS. However, if any of these factors are overlooked then the potential for dissatisfaction is increased (Zanjani et al., 2013). Given the extensiveness of LMS presence within higher education, it is imperative that they are used in a manner that maximises the learning opportunities for students, while not being overly arduous for staff to manage. The existing literature points to two broad affordances common to all LMS: *accessibility* (Murray, Perez, Geist, & Hedrick, 2012; Naveh, Tubin, & Pliskin, 2010) and *interactivity* (Park, 2015). Accessibility refers to the LMS capability to act as an effective repository of course documents or other digital resources, while interactivity relates to the features of an LMS that enable students and/or staff to interact with each other and with the content in the course in various ways.

Teacher education is a field of higher education that has embraced technology to varying degrees. In many institutions face to face teaching is highly valued although there are some instances where fully online learning is employed for teacher education, despite some teacher educators’ perceived lack of preparation for engaging in effective pedagogical techniques in the online environment (Downing & Dymont, 2013; H. Jones, 2012). There is

also evidence that interaction in the online environment can lead to growth in critical thinking skills for teacher education students, although for this to occur careful and timely modelling and intervention by the teacher educator is needed (M. Jones & Ryan, 2014; Szabo & Schwartz, 2011). We will argue in this paper that in order for optimal learning to be actualised, both instructors and students need to have a comprehensive understanding of the affordances of the LMS medium.

This paper reports on a study that examines staff and student perspectives on various LMS features in a regional teacher education institution in 2013. The study seeks to answer the following research questions:

1. How do teacher education staff and students perceive the effectiveness of LMS components in their courses?
2. How are the LMS affordances of accessibility and interactivity viewed by staff and students?

The results will provide evidence for institutions of higher education as they work to improve the effectiveness of LMS for enabling student learning, from the perspectives of both students and staff.

Method

The data for this paper were collected from postgraduate and undergraduate students and staff within an Education School. In this School, teaching has traditionally been conducted in a face to face mode, although an LMS has been available for use for more than 10 years. As face to face teaching hours have decreased in recent years, greater staff reliance on the LMS as a means of communicating with students, has resulted. In the study context, student attendance at lectures is not compulsory, thereby increasing student reliance on supplementary means of accessing learning materials through the LMS. While technical support is available for staff, to enhance their capability in using the LMS, professional development for staff is not compulsory, leading to a wide variability in staff capacity to optimise technology use for learning.

In total 132 staff were invited to complete the survey and responses were received from 46 (response rate 35%), while 5474 students were invited and 470 responded (8.5% response rate). Staff and students were asked to rate the effectiveness of various components of their LMS, Blackboard ©, using a 4 point scale from “not effective at all” to “very effective”. The student participants were then asked to indicate their willingness to participate in a post-survey focus group. Two focus groups were conducted with four students in each group. The student focus groups were mixed in terms of gender and types of students (undergraduate, postgraduate, research).

Similarly, staff were invited to participate in post-survey interviews, resulting in seven staff interviews (5 female). The focus groups and interviews were audio recorded and then transcribed. The transcripts were coded thematically in relation to student and staff perspectives on the affordances of accessibility and interactivity.

Results

Survey Analysis

The initial analysis involved an examination of the Likert-style survey responses from students and staff in relation to their perceptions of the effectiveness of various LMS components. They were asked, “How effective are the following e-learning tools for

supporting student learning/supporting your learning?” The students and staff were also given the option of responding that they had never used that particular component of the LMS. The responses are summarised in Table 1, where the percentage responses for each item is reported, along with mean scores (Not effective at all = 1; Somewhat effective = 2; Quite effective = 3; Extremely effective = 4).

E-learning component		Students/Staff (% who have never used this e-learning component)	Mean weighted score	Rating by students/staff who have used this e-learning component			
				Not at all effective (%)	Somewhat effective (%)	Quite effective (%)	Extremely effective (%)
Components enabling interactivity	LMS discussion boards	Students (8.3) Staff (6.7)	2.7 2.8	9.0 4.8	36.2 31.7	31.3 46.3	23.4 17.1
	LMS blogs or wikis	Students (54.0) Staff (51.1)	2.3 2.7	26.9 9.4	31.5 33.4	29.2 33.4	12.5 23.8
	LMS quizzes or tests	Students (29.4) Staff (42.2)	3.0 2.7	5.1 12.1	20.2 28.1	41.0 39.9	33.7 20.0
	LMS surveys*	Students (45.5) Staff (57.8)	2.6 2.1	12.8 22.2	31.9 44.5	42.2 33.3	12.8 0
	LMS synchronous discussion sessions	Students (64.9) Staff (75.6)	2.5 2.6	19.4 30.2	25.9 19.8	35.0 9.9	19.4 40.1
	Videos made by university lecturers	Students (35.7) Staff (35.6)	3.1 2.7	7.0 10.8	17.0 28.6	38.7 39.2	37.3 21.4
	Recordings of face-to-face lectures*	Students (29.6) Staff (20.0)	3.3 2.9	5.7 5.7	13.4 22.9	28.4 48.6	52.6 22.9
	Documents made available on LMS	Students (2.3) Staff (0)	3.6 3.4	0.2 2.2	8.7 4.5	27.0 40.9	64.1 52.2

* Responses significantly different at 0.05 level (Mann-Whitney U test)

Table 1: Student and Staff rating of effectiveness of LMS components for supporting student learning

In relation to research question one, relating to the constituent elements of the LMS, the analysis of the student response mean scores demonstrates that the most effective element of the LMS, from the students’ perspective, is the ability to access course documents (3.6). Of the other choices provided, they valued access to recordings of face to face lectures next (3.3), followed by videos made by course lecturers (3.1) and then online quizzes or tests (3.0). For staff, they also rated access to course documents as the most effective support for student learning (3.4), followed by recordings of face to face lectures (2.9), course blogs or wikis (2.9) and online discussion boards (2.8). For students, the least ranked effective affordance to support student learning was course blogs or wikis (2.3), then synchronous online sessions (2.5) and LMS surveys (2.6). From the staff perspective the least effective affordance was LMS surveys (2.1) followed by synchronous online sessions (2.6). Therefore, we found broad agreement between student and staff views on the various components of the

LMS, although in most cases students, on average rated the value of the components more highly than staff.

In terms of research question two, which relates to the responses of staff and students to items about the two affordances under scrutiny, only two of the tools under examination revealed a statistically different response. Specifically, students (3.3) valued being able to access recordings of face to face lectures more highly than staff (2.9), and staff (2.1) rated the effectiveness of the survey tool lower, on average than students (2.6). It should be noted however that more than half of the staff respondents had never used this particular LMS tool.

Considering the notion that the LMS tools can be broadly categorised as allowing for the affordances enabling accessibility and interactivity, the mean scores for staff and students for each affordance are displayed in Table 1. An independent samples t-test indicates that there is a significant difference in the scores for staff ($M=3.7$, $SD=0.7$) and students ($M=3.4$, $SD=0.8$) in relation to the perceived effectiveness of LMS tools providing accessibility to resources ($t(512)=2.367$, $p=0.018$), however, there was no corresponding difference found in relation to the tools which facilitate interactivity within the LMS. In other words, students valued the accessibility of course documents, recorded lectures and other videos produced by lecturers, as being significantly more effective components of the LMS, for supporting learning, than did staff. However, in terms of LMS tools which supported interactivity, there was no difference between the mean student and staff rankings of the effectiveness of these tools, and in general, they were perceived as being less effective for supporting student learning than tools enabling accessibility of course resources.

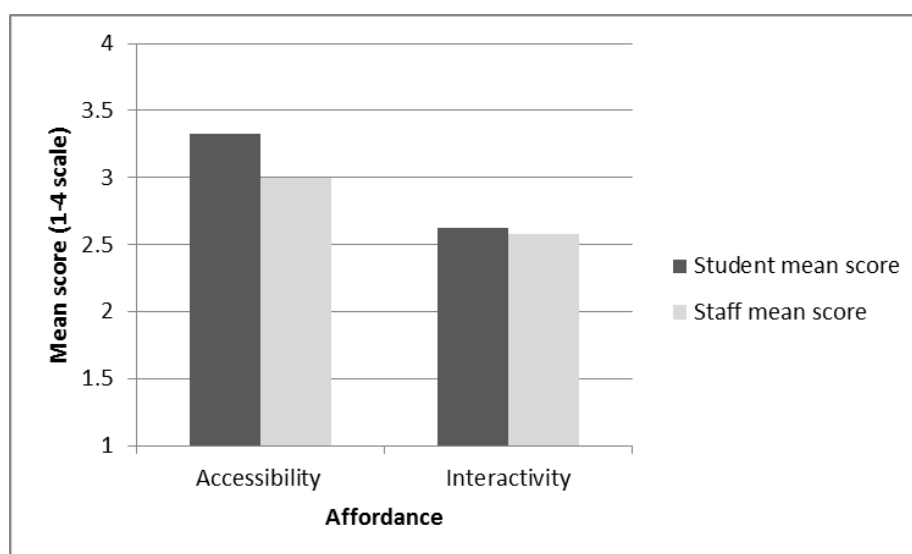


Figure 1: Student and Staff mean scores by Affordance Type

Student Focus Group and Staff Interview Analysis

Accessibility

The survey results revealed student and staff opinions of three aspects of LMS use related to the affordance of accessibility: the ability to access documents, recordings of face to face lectures and videos made by lecturers. Both staff and students rated the ability to access course documents as being more effective in supporting student learning than being able to access recordings of lectures or other videos made by the lecturer. In this section, these findings will be elaborated through the use of quotes drawn from student focus groups and staff interviews.

Recordings of Live Lectures

The students were asked for their thoughts about the benefits or drawbacks of being able to access online recordings of live lectures via their LMS. This affordability of the LMS was judged favourably by students in the survey. Most students indicated that they appreciated the flexibility of being able to access lectures at a time other than the scheduled lecture time.

It can be a bit of a struggle sometimes. Things come up. You can't make it to a lecture and its all hand written notes, so you have to ask your friends for notes and stuff. If people write things differently to how you would and, yeah, I think it's very important to have (recordings) available. (Abby, female, undergraduate, focus group 1)

A supplementary idea was raised by other students indicating that it would be beneficial to be able to access the lectures from remote locations in real time and to possibly interact with them. Please note here that 'Echo360' is the online recording system for capturing lectures/tutorials in the LMS.

I think it would be better if echo, you could watch the lecture as it was happening. So if you could, like if you didn't want to travel to uni you could still watch it at the time. (Sandra, female, postgraduate, focus group 2)
Yeah, like an interactive thing where you could, if you were doing it from home you could like type a response to the lecturer's questions and they could see it. That would be really difficult probably, I don't understand computers, but I think it would be cool like tweeting to the lecturer. (Suni, female, undergraduate, focus group 2)

Although one student did note the substantial time demands required to watch a lengthy recorded lecture and praised a lecturer who opted for shorter videos targeted for particular content.

...it was short audio recordings of sort of a little bit interpretive if you like of the readings and the questions or focus that we had in the particular week. Something that I really liked about them was that they were really short. It was about seven minutes or so. So that's quite a different way of thinking about it than, say, you know, here's a one hour lecture... (Brendan, male, postgraduate, focus group 1)

As explained earlier, at the institution in which this study was conducted lectures are generally recorded as audio only accompanied by the PowerPoint slides from the lecture, the 'echo' system. Some students did appreciate that the option to listen to the recorded audio was available, however, they stated that they generally did not access the audio recording, preferring instead to learn via the PowerPoint slides only.

I know the audio is right there but in my case I rarely listen to the audio recording. [Facilitator] Because you can get the information from the slides? Yeah, from the slides. Maybe I'm not very interested in listening to the pre-recorded audios. In my case if I have a chance I would prefer to attend the lectures or the seminars in person, face to face. (Abby, female, undergraduate, focus group 1)

One common complaint was related to the dislike of poor quality audio recordings, which seemed to negate any perceived benefits of having the flexibility to access lectures outside of scheduled lecture times; "I reckon the poor quality is totally irritating. It's really irritating." (Brendan, male, postgraduate, focus group 1)

Organisation of LMS Sites

Apart from quality issues associated with poor audio recordings, students also noted that their ability to access online materials within their LMS was often impacted by the poor organisation of each LMS course site. Each lecturer has the freedom to organise their course resources in different ways, which could potentially be beneficial to student learning, however many students expressed frustration as they were frequently unable to find key resources in a timely manner.

Yeah, sometimes things are all over the place. I have one course at the moment where there's an assessment tab but in there is only submission and then in the course outline tab we have a rubrics of - but at some point really I feel like that should be in assessment because it's to do with our assessment. I don't know, just having, like a checklist of this is what goes in course outline, this is what goes in the assessment tab. Some courses haven't even had a discussion board access. (Nicole, female, postgraduate, focus group 1)

Everything is there but it's kind of - it is hidden. (Abby, female, undergraduate, focus group 1)

Students made suggestions for how LMS sites could be better organised, expressing the view that some uniformity in the way that lecturers set up their sites could be beneficial.

I've had ones where they have course materials and then they'll have readings.

Then they will be organised into weeks and lecture notes organised into weeks.

(Abby, female, undergraduate, focus group 1)

If it was really organised and sort of uniform - if you're doing four courses you want them all to be the same because you know where to go. (Nicole, female, undergraduate, focus group 1)

One student commented on the lack of a search function within the LMS site. This function was seen as a feature that should be available given that it is standard within most internet sites

I mean, it's just bizarre???. Truly bizarre. You think of any website that you go to and you want to find something the first thing you do is search. Not in Blackboard. You can't Google or anything because it's closed off and all the rest of it (Nick, male, undergraduate, focus group 1)

Staff Views: Accessibility

In alignment with the views expressed by students, the lecturing staff interviewed were very supportive of making resources, including recorded lectures, available online, however, there were concerns that students were not always diligent and timely in the ways in which they accessed the materials. For example, one lecturer had noted a consistent decline in lecture attendance over the period in which accessibility of resources had increased and was not convinced that students were actually engaging with the online materials in an effective way.

I do think it's important that we try and help be flexible with our delivery.....but I also think that there's a certain amount of responsibility that students need to have for their own learning, and I have noticed a decline in that....(Female staff member 1)

However, another lecturer, while also lamenting the lack of attendance and engagement with the online material, did point out that students could also be sitting in a lecture theatre and still not be thinking about the lecture. In other words, attendance at face to face lectures was no guarantee that students were actively participating in learning.

The staff were asked to comment about the organisation of their LMS course sites, particularly as students had expressed dissatisfaction with the lack of a standardised approach. Most staff agreed with the suggestion that some kind of standardisation would be useful for students, however, it was apparent that various approaches were currently in place. For example, some lecturers explained that they organised their course around weeks, with course materials available on a week by week basis, whereas others took a more thematic approach, with different sections for different topics. Others tended to put important materials in multiple places within the LMS to increase the likelihood that students would find them. Another staff member felt it was important that staff had the freedom to set up their courses in the most effective ways and that standardisation of LMS sites could be detrimental.

Overall, staff and students are generally positive about the benefits of using LMS as a platform for making learning materials accessible for students, however, as noted in the survey results, staff were largely less positive in relation to this affordance than students. These differences seemed to arise from staff perceptions that student attendance had decreased as accessibility to recorded lectures had increased, often leading to students being underprepared for tutorial activities and assessment tasks. Accessibility of resources does provide students with choices about how and when to access learning materials, giving them greater responsibility for monitoring their progress and learning, however, the staff interviewed expressed the view that this responsibility was not always taken seriously by students, so that although they recognised the benefits of accessibility afforded by the LMS as important, they also recognised that some students required more personal contact, structure, direction and monitoring than the LMS provides. Advances in the design of LMSs including learning analytics and automatic student response systems, may allow for improved tracking of levels of student engagement with resources and at the same time reduce the burden on staff time.

Interactivity

In terms of interactivity, the survey results implied that tools within the LMS with this capability were generally less valued than those affording accessibility. Students rated the use of LMS quizzes or tests the highest of all interactive elements, while staff indicated a preference for online interactions enabled by the discussion board feature. Students in the focus groups were asked about these interactive features of the LMS and in comparison to their appreciation for the features of the LMS allowing for access to resources and lectures, there were mixed feelings about the benefits of the interactive tools. Their comments help to explain the lower ranking given in the surveys in relation to the interactive affordances of the LMS.

Student Views: Discussion Boards v. © Facebook

In some cases, students' lack of enthusiasm for interactivity was related to the complicated nature of the tools:

Well, in my case the general discussion board is something I definitely don't like because, like, because users of our software it's really complicated to navigate around a discussion board. (Brendan, male, postgraduate, focus group 1)

Or there was concern expressed that the online tools, in this case the discussion boards, were not sufficiently integrated within the course.

But overnight, you know, I introduced myself on a discussion board and that's been the limit of my engagement. They're not - in this course that I'm thinking

about, the discussion boards are not at all integrated into - there's no learning activities around that. (Nick, male, undergraduate, focus group 1)

What I observe from discussion board is the main function is to introduce ourselves and after that people seem to forget that its existence. (Abby, female, undergraduate, focus group 1)

Students indicated that they needed to see a purpose for using the interactive tools, such as discussion boards, primarily because they are time poor and are focussed on assessment requirements as a first priority.

I mean, you can also have discussion or it's being used around particular assessment tasks too rather than, you know, like, if there's a project on or something maybe people give feedback to each other on drafts of their report or something like that. Then there's a very particular purpose. I reckon that's a good point actually there's got to be some reason for it; some explicit reason for it too. (Brendan, male, postgraduate, focus group 1)

Alternatively, when the discussion board was integrated into the course as part of the assessment requirements for the course, students were more positively inclined toward participation.

But I did a course last semester and we read the readings, had to post a comment on Blackboard and then had to respond to someone else's comment. I thought that was a good way to sort of facilitate discussion board usage, and it was marked as well so we had to do it. (Nick, male, undergraduate, focus group 1)

Also, they perceived that the LMS environment was a poor substitute for face to face interaction, they indicated that they enjoyed virtual interaction through other mediums, such as Facebook®.

It is hard to make, like, the discussion board effective and a stimulus because there's - I know in undergraduate teaching there's a Facebook page called teaching friends. Its got 1500 people on it. So if you have a question you just go there because there's fourth years to first years. Everyone has Facebook® on their forum so it's just easy. (Abby, female, undergraduate, focus group 1)

Tools such as Facebook®, outside of the LMS environment, were seen as being able to handle large numbers of students as they interacted, providing timely responses to questions about the course. In contrast the restrictive and somewhat clunky nature of the LMS discussion board was seen to provide a disincentive for students to participate:

I reckon numbers is really important too. If I'm in a group of 15 that - I can sort of handle that. But, you know, if it's 100 people - - - (Brendan, male, postgraduate, focus group 1)

- - - every time I log on it must be, like, wall of comment and it's really hard to sort of get into it somehow and connect with it. So I reckon if you've got 15 people in a course that's great. If there's more then you're going to need two groups or three, for instance. It's kind of like a tutorial I guess. (Nick, Male, undergraduate, focus group 1)

The affordances of Facebook® were seen to extend beyond the academic portion of the course, by more effectively promoting parallel social engagement, leading to a sense of enjoyment not able to be fostered within the more formal confines of the LMS.

And it promotes engagement not purely on an academic level but just like here's a funny meme about what we were talking about in class today, ha-ha, and it does promote a sort of deeper engagement, not because of the academics of it,

but just because of the social sort of aspect of the courses which I think is just as important. (Blair, male, research student, focus group 2)

So like you'll open up your computer and you'll open up Facebook© straightaway. You won't go and open up blackboard and then go through, navigate, find yourself a discussion board and then try to navigate through a clunky system. (Dan, male, undergraduate, focus group 2)

Students reported that some lecturers had noticed the benefits of tapping into existing social media platforms, rather than being restricted to the LMS.

But a lot of tutors have started creating like Facebook© pages and then to create discussion on there in more of a relaxed setting. The discussion boards are very formal still. (Dan, male, undergraduate, focus group 2)

The benefits of this approach were explained by one student in terms of equity of access:

But at the same time I would acknowledge that like not everyone has Facebook© and that's where Blackboard is probably used because everyone does have access to Blackboard. So it does automatically exclude some. (Dan, Male, undergraduate, focus group 2)

Staff Views: Discussion Boards and Quizzes

Like the students, staff tended to be wary of many of the LMS interactive tools. The discussion board, for example, was often viewed only as a place for students to complain about aspects of a course, particularly if it was set up in an open-ended manner and was not an integrated part of the assessment for that course. However, one lecturer who always sets up discussion boards within the LMS commented that complaints could be minimised if the discussion board was carefully monitored and student comments responded to promptly.

I've always had very good feedback on the discussion boards. I've never had anyone complain about it, but perhaps it's because I respond to them quickly (Female staff member 2).

Some staff pointed out that discussion boards were unwieldy in very large courses leading to a disproportionate amount of time spent monitoring and responding to student questions. However, it was also expressed that these concerns could be curbed by managing student expectations in relation to the amount of staff interaction.

So the way I've bypassed this problem is by telling them exactly when I am going to check the discussion boards. So they know that I check them on Mondays and Thursdays and that they will get a response on Monday or Thursday. They are not expecting anything in between (Female staff member 1).

Another staff member carefully planned their degree of interaction on the discussion board, starting each course by responding to every student post and then gradually allowing students to respond to each other as the course progresses and student familiarity with each other grows. However, this staff member continues to monitor the discussion board daily so that no post goes unanswered for more than three days. He also commented that the purpose of the discussion board was very important and that grouping students in groups with less than 20 members kept the discussion board functional and allowed students to form social bonds that might not be feasible in larger groups.

Discussion boards are most useful when they are extremely focussed or have the ability to provide social contact. (Male staff member 1).

Of the six staff interviewed only one was an active user of online quizzes as a means of assessment. In this case the quizzes were used after students had read some material and attended a face to face class. Interestingly student responses to the quizzes were then used as

a discussion prompt in the next face to face class, ensuring that the online interactivity was acknowledged and integrated with face to face interactions. For all other staff online quizzes were perceived negatively due to the nature of the course content or the risks involved for students who might experience a technology failure mid-quiz.

The staff and student comments about the interactive aspects of LMS are clearly less positive than those offered in relation to features enabling accessibility and the survey results indicate that, apart from discussion boards and quizzes, that most other interactive features had not been experienced at all by a large proportion of staff and students. Students tended to look outside of the LMS environment to other online interactive tools such as Facebook© for student-student interactions related to coursework, primarily because of the ease of use of these tools in comparison to the interactive LMS tools. Staff, on the other hand, indicated a degree of reluctance due to the time demands placed on them in attempting to meaningfully integrate these tools within their courses.

Discussion and Conclusions

According to the literature there are varied opinions of the value of LMS for supporting student learning despite their pervasiveness as a key piece of infrastructure in higher education (Beetham & Sharpe, 2013; Mott & Wiley, 2009). The data reported in this paper provides a snapshot of opinions on the various components of LMS from the perspectives of staff and students and in doing so, reveals the extent to which these features are valued by end-users and support student learning. While there is some alignment between staff and students, there are also key differences which highlight opportunities for higher education instructors to modify LMS use.

Both students and staff expressed greater appreciation of the LMS affordance of accessibility than they did of the features which support interactivity. Students valued the flexibility allowed through their ability to access course materials at any time but expressed frustration if the materials were of poor quality or difficult to find within the LMS. While staff also felt that this aspect of the LMS was beneficial for student learning, they noted that they had observed a decrease in student attendance when material was available online. This observation of student behaviour aligns with Anderson's (2003) interaction equivalency theory, which implies that students will be satisfied with interactions of one type, forgoing other equivalent interactions. In the case of blended learning, where both online and face to face learning opportunities are available, students appear to view interaction with content, whether virtual through the LMS or in a lecture theatre as equivalent options, provided the virtual options are of adequate quality. In contrast, and in alignment with Zanjani et al. (2012), we found that staff appeared to view face to face options as preferable to LMS enabled interactions and expressed fears that students opting for the online content only would be receiving a substandard version of the content. In other words, staff and student opinions differed in relation to the 'equivalence' of various options for accessing course content.

In terms of interaction with other course participants through the LMS (student-student or student-teacher, following Anderson's classification), staff and students had mixed views and many study participants had not used these tools (Zanjami et al., 2013; Park, 2015). Discussion boards were the most used of the LMS tools enabling interactivity between course participants, in contrast to tools for synchronous discussions which had not been used by the majority of participants. However, students raised concerns about the unwieldy nature of the discussion boards for supporting fruitful virtual conversations, indicating that they preferred to avoid this LMS feature unless they were required to participate for assessment

purposes. Applying interaction equivalency theory, it appears that LMS-enabled discussions are not viewed by students as equivalent to face to face discussions and therefore are not willingly taken up by students unless assessment is embedded into its use. In reference to LMS-supported discussions, students expressed the view that popular social media platforms were their preferred option for student-student discussions about coursework, signalling that LMS development was yet to match the ease of use of discussion forums commonly used outside of formal education settings.

Of the LMS tools facilitating interactivity (Park, 2015), students rated online quizzes most highly, indicating their preference for interactions focussed on course content and including automatic feedback. This is potentially one affordance of the LMS which operates more effectively than a comparable activity in a regular classroom setting. While the nature of automatically scored quizzes places some restrictions on the types of knowledge that can be assessed, the instant feedback does provide students with timely feedback on their performance. While other LMS tools in the interactive category, for example, discussion boards are more effective when replicated in a face to face context, online quizzes may be perceived as superior to classroom based assessments which usually take time to be marked and returned to students. In terms of interaction equivalence theory, it would appear that this particular LMS tool can be perceived as a very effective or even superior alternative to analogous traditional testing techniques.

In conclusion, staff and student perspectives on the effectiveness of affordances provided by LMS, lend support to *interaction equivalence theory* as an explanatory mechanism for student behaviour in online and blended learning settings. In the online learning context, teachers have no choice but to utilise LMS features to maximise the affordances of the tools available, however, in the blended learning environment, staff must make choices about when to use these tools as an adjunct to or a replacement for face to face teaching strategies. Based on the analysis presented in this paper, Anderson's (2003) theory provides an appropriate theoretical position from which staff can consider these choices. It seems that students will readily accept, and indeed will preference feasible alternatives to traditional face to face teaching strategies provided via LMS, if those choices result in equivalent or better educational experiences. The question for teaching staff, therefore, is to carefully consider the affordances offered by LMS tools, and to ask whether the use of any particular tool can complement or supplement routine teaching and learning strategies. If the LMS can only offer an inferior alternative then the most efficacious approach would be for staff to make pre-emptive choices not to use these tools, removing the onus on students to experience and make decisions about potentially substandard learning tools. For this to happen, however, both staff and students must have a comprehensive understanding of the affordances of the medium and how these affordances can best be actualised.

This study was conducted in the context of teacher education, examining the perceptions of both undergraduate and postgraduate students. The vast majority of these students were aspiring to careers in K-12 school settings or in early childhood centres where face to face teaching is the dominant model. It is interesting to consider, therefore, how their reflections on their experiences of blended learning might impact on their pedagogical approach with their future students. Increasingly digital technologies are finding their way into school classrooms and teachers are using LMSs to organise student work and manage their interactions with students. Therefore, the messages relayed through this study may not only apply to higher education but also to education for students of any age. Understanding the deliberate choices to be made in relation to technology use, through the lens of interaction equivalency theory, will be an important skill for all future teachers.

References

- Anderson, T. (2003). Getting the mix right again: An updated and theoretical rationale for interaction. *The International Review of Research in Open and Distributed Learning*, 4(2). <https://doi.org/10.19173/irrodl.v4i2.149>
- Beetham, H., & Sharpe, R. (2013). *Rethinking Pedagogy for a Digital Age: Designing for 21st Century Learning*: Routledge. <https://doi.org/10.4324/9780203078952>
- Downing, J. J., & Dymont, J. E. (2013). Teacher Educators' Readiness, Preparation, and Perceptions of Preparing Preservice Teachers in a Fully Online Environment: An Exploratory Study. *The teacher educator*, 48(2), 96-109. <https://doi.org/10.1080/08878730.2012.760023>
- Heirdsfield, A., Walker, S., Tambyah, M., & Beutel, D. (2011). Blackboard as an Online Learning Environment: What Do Teacher Education Students and Staff Think? *Australian Journal of Teacher Education*, 36(7), 1-16. <https://doi.org/10.14221/ajte.2011v36n7.4>
- Herrington, J., Reeves, T. C., & Oliver, R. (2005). Online learning as information delivery: Digital myopia. *Journal of Interactive Learning Research*, 16(4), 353-367.
- Jones, H. (2012). *Teachers, and their opinions, matter: Analysing staff perceptions of the effectiveness of online discussion forums*. Paper presented at the ASCILITE-Australian Society for Computers in Learning in Tertiary Education Annual Conference.
- Jones, M., & Ryan, J. (2014). Learning in the practicum: engaging pre-service teachers in reflective practice in the online space. *Asia-Pacific Journal of Teacher Education*, 42(2), 132-146. <https://doi.org/10.1080/1359866X.2014.892058>
- Jurado, R. (2012). Barriers to a wider Implementation of LMS in Higher Education: a Swedish case study, 2006-2011. *elead*(9).
- Klobas, J. E., & McGill, T. J. (2010). The role of involvement in learning management system success. *Journal of Computing in Higher Education*, 22(2), 114-134. <https://doi.org/10.1007/s12528-010-9032-5>
- Lonn, S., & Teasley, S. D. (2009). Saving time or innovating practice: Investigating perceptions and uses of Learning Management Systems. *Computers & Education*, 53(3), 686-694. <https://doi.org/10.1016/j.compedu.2009.04.008>
- Miyazoe, T., & Anderson, T. (2010). The interaction equivalency theorem. *Journal of Interactive Online Learning*, 9(2).
- Mott, J., & Wiley, D. (2009). Open for learning: The CMS and the open learning network. *in education*, 15(2).
- Murray, M., Perez, J., Geist, D., & Hedrick, A. (2012). Student Interaction with Online Course Content: Build it and they might come. *Journal of Information Technology Education: Research*, 11, 125-140. <https://doi.org/10.28945/1592>
- Naveh, G., Tubin, D., & Pliskin, N. (2010). Student LMS use and satisfaction in academic institutions: The organizational perspective. *The internet and higher education*, 13(3), 127-133. <https://doi.org/10.1016/j.iheduc.2010.02.004>
- Palmer, S., & Holt, D. (2014). Development of student and academic staff perceptions of the elements of an online learning environment over time. *Australasian Journal of Educational Technology*, 30(4). doi: 10.14742/ajet.581 <https://doi.org/10.14742/ajet.581>
- Park, J. Y. (2015). Student interactivity and teacher participation: an application of legitimate peripheral participation in higher education online learning environments. *Technology, Pedagogy & Education*, 24(3), 389-406. <https://doi.org/10.1080/1475939X.2014.935743>

- Renzi, S. (2011). Differences in university teaching after learning management system adoption: an explanatory model based on Ajzen's theory of planned behavior (by Stefano Renzi with Danielle H. Lee as Coordinator). *ACM SIGWEB Newsletter*(Summer), 4. <https://doi.org/10.1145/1980002.1980006>
- Rowley, J., & O'Dea, J. (2014). Enjoyment of eLearning Among Teacher Education Students in Australia. *International Research in Education*, 2(1), 134-144. <https://doi.org/10.5296/ire.v2i1.4794>
- Rubin, B., Fernandes, R., Avgerinou, M. D., & Moore, J. (2010). The effect of learning management systems on student and faculty outcomes. *The internet and higher education*, 13(1–2), 82-83. <https://doi.org/10.1016/j.iheduc.2009.10.008>
- Szabo, Z., & Schwartz, J. (2011). Learning methods for teacher education: The use of online discussions to improve critical thinking. *Technology, Pedagogy and Education*, 20(1), 79-94. <https://doi.org/10.1080/1475939X.2010.534866>
- Waycott, J., Bennett, S., Kennedy, G., Dalgarno, B., & Gray, K. (2010). Digital divides? Student and staff perceptions of information and communication technologies. *Computers & Education*, 54(4), 1202-1211. <https://doi.org/10.1016/j.compedu.2009.11.006>
- Weaver, D., Spratt, C., & Nair, C. S. (2008). Academic and student use of a learning management system: Implications for quality. *Australasian Journal of Educational Technology*, 24(1). <https://doi.org/10.14742/ajet.1228>
- Zanjani, N., Nykvist, S. S., & Geva, S. (2012). *Do students and lecturers actively use collaboration tools in learning management systems?* Paper presented at the Proceedings of 20th International Conference on Computers in Education (ICCE 2012).
- Zanjani, N., Nykvist, S. S., & Shlomo, G. (2013). *What makes an LMS effective: a synthesis of current literature.* Paper presented at the Proceedings of CSEDU 2013–5th International Conference on Computer Supported Education.