



## Navigating An LMS Review Process: Harnessing Next-Generation Digital Learning Through Evidence-Based Decision-Making

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### Abstract

Universities across Australasia regularly evaluate their Learning Management Systems (LMS) to meet the increasing digital teaching and learning demands. LMS reviews conducted approximately every five years or so are driven by factors such as pandemics, contract renewals, fiscal considerations, and the pursuit of optimal student online learning experiences. Recent trends show that Australian universities are conducting LMS reviews more frequently and transitioning to new LMSs at an accelerated pace (Phil, 2022; Sankey, 2023a). This is to ensure the LMS of choice meets the Next Generation Digital Learning Environment (NGDLE) functionality (Educause, 2018), is affordable, reliable and is still fit for purpose. While ongoing LMS reviews are common, there is a lack of published information on how higher education institutions undertake them. There was little available to unpack how best to engage in open, transparent, and aspirational conversation with staff and students about their experience with the LMS. As part of the review, even less was published about the dialogue on the future teaching and learning needs and the future of the LMS. To help address this gap in the literature, this practice-based paper reports on our approach and the steps taken to propose a unique two-phase / multi-stage model for reviewing an LMS and offers a useful checklist for those who may want some help getting started.

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# Introduction

## Developing two key questions

This paper provides a critical analysis of the efforts of one Australian University, Charles Darwin University (CDU), as they engaged in a comprehensive Learning Management System (LMS) review. As digital teaching and learning needs continue to evolve, universities find themselves under increasing pressure to ensure their LMS is suitable for delivering to increasingly diverse demands. The authors of this paper aimed not only to ensure a solid core LMS experience, but also to advance institutional cultures of innovation and to overcome potential innovation paradox and gridlock (Udas, Brosnan & Wade, 2017; Aghina, De Smet, & Weerda, 2015). In short, the institution required an LMS that was stable and reliable while, at the same time, providing opportunities for staff to be more innovative and contemporary in their approach to teaching.

To advance this review, the LMS Review Team (as distinct from the LMS Review Group who would ultimately make the decision, while the 'Team' were the ones running the review) initially consulted across the higher education sector to establish how others had conducted their LMS reviews but found little published information on best practices for engaging in an open and transparent process with staff and students. To address this gap in the literature, this paper proposes an approach based on the experiences of a regional university and reflects on the validity and affordances of the model being proposed.

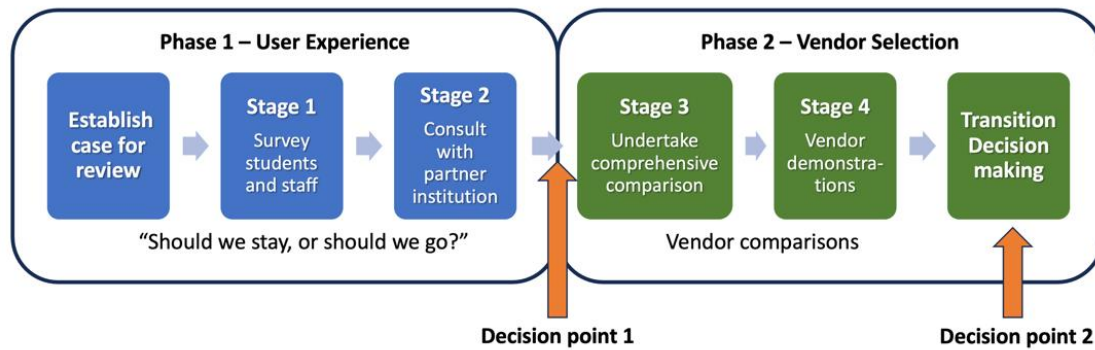
To inform this, the following two research questions were framed to guide the review:

- 1) What considerations need to be had when conducting an LMS review and when planning for a transition?
- 2) What steps and checkpoints must be considered when conducting an LMS review that recommends considering a transition?

## The LMS review process

This paper proposes a highly consultative, dual-phase/four-stage process used by Charles Darwin University (CDU) to serve as a model when approaching a Learning Management System (LMS) review. Illustrated in Figure 1, Phase 1 (Stages 1 and 2) involved consultation with staff and students to better understand the user experience to establish current and future needs. Phase 2 (Stages 3 and 4) progressed decision-making through vendor responses to institutional needs and requirements, along with vendor demonstrations. Two key decision points are highlighted. This paper provides a proposed approach to this process, including suggestions for transition and decision-making.

**Figure 1.** *Phases, Stages and Decision Points of the LMS Review*



Phase 1 / Stage 1 of the review involved surveys of students and staff complemented by student focus groups to inform the CDU user experience. In keeping with CDU ethics principles, participation was entirely voluntary, with informed consent, the right to withdraw, and ensuring data de-identification.

Key stakeholders (students and staff) were provided the opportunity to outline their concerns, voice opinions, offer suggestions on future features, evaluate their experience, and essentially evaluate whether the LMS was still fit for purpose. The results from Stage 1 informed Stage 2, where the universities' strategic teaching and learning objectives were mapped and aligned to themes that emerged from formal surveys and focus groups. The mapping informed the overall list of requirements along with any further technical and administrative considerations that needed accounting for.

Phase 1 / Stage 2 included comparing results with a partner institution also undergoing a review of their LMS at the same time. Added validity was achieved for both institutions by involving an external consultant to advise on the analysis of data and to assist in the decision-making process. Decision point 1 (Figure 1) was the point at which to determine if there was a need to progress to Phase 2.

This would include the selection of potential vendors to provide details of their systems and, ultimately, a demonstration of their products. This involved inviting responses to the identified needs and requirements identified in Phase 1. These vendor responses were scored against agreed criteria, resulting in a comprehensive and quantitative comparison of the systems. A weighted decision-making process aligned with the criteria informed the shortlisting of products before progressing to demonstration (Stage 4). Vendors were asked to demonstrate their products based on a series of scenarios provided in advance. These scenarios are openly shared via a CDU open educational resource, 'LMS Review Kit' <https://cduebooks.pressbooks.pub/lmsreview/>.

Lastly, university stakeholders (the LMS Review Group) rated the demonstrations and shared their preferences and recommendations. These, alongside a cost-benefit analysis, informed Decision point 2 (Figure 1). As a result, in this particular case, with a lack of strong evidence to warrant a transition, the university chose to remain with its current vendor. This paper will detail how this project evolved and was able to come to a final resolution and provide a step by step guide as to how it conducted this review.

## Context

The LMS is an online software system that supports various instructional, learning and assessment activities and is the central element of many university course delivery platforms (Turnbull et al., 2022). The LMS plays a crucial role as part of the online educational ecosystem, by providing a highly organised set of software affordances. CDU had been using the same LMS for the past twenty-one years at the time of the review. In 2021 CDU proposed a new strategic plan for 2021-26, as part of this, several initiatives were proposed to enhance the use of educational technologies and reinforce the university's position as "Australia's most connected university" (CDU, 2021). To achieve this objective, the university required a suite of learning tools (technologies) that would work seamlessly with other technologies for students and educators. In light of this, it was imperative for CDU to undertake a comprehensive review of the LMS to ensure it was providing every opportunity for its staff and students to work together in the most contemporary online environment.

## Partnerships

As thinking about the review developed, an opportunity emerged to associate the CDU review with a like-minded institution (using the same LMS). CDU joined forces with James Cook University (JCU) in their review and collaborated to engage a third-party consultant to assist and support the review process. This collaboration enabled the institutions to benchmark findings and results, share and cooperate in the approach and ultimately strengthen a partnership between the two institutions. The collaborative review involved the analysis of the LMS market, commentary on the LMS roadmap, analysis of the vendor relationship and gathering quantitative and qualitative feedback from critical user-stakeholders. The latter included students, educators, and professional staff, through surveys designed specifically for each group. After the Stage 1 review, each institution determined its next steps considering the context and results of each university. This collaboration strengthened not only cooperation between the institutions but also enabled a deeper understanding of the two contexts.

## Literature Review

### ***A view of a contemporary online learning ecology***

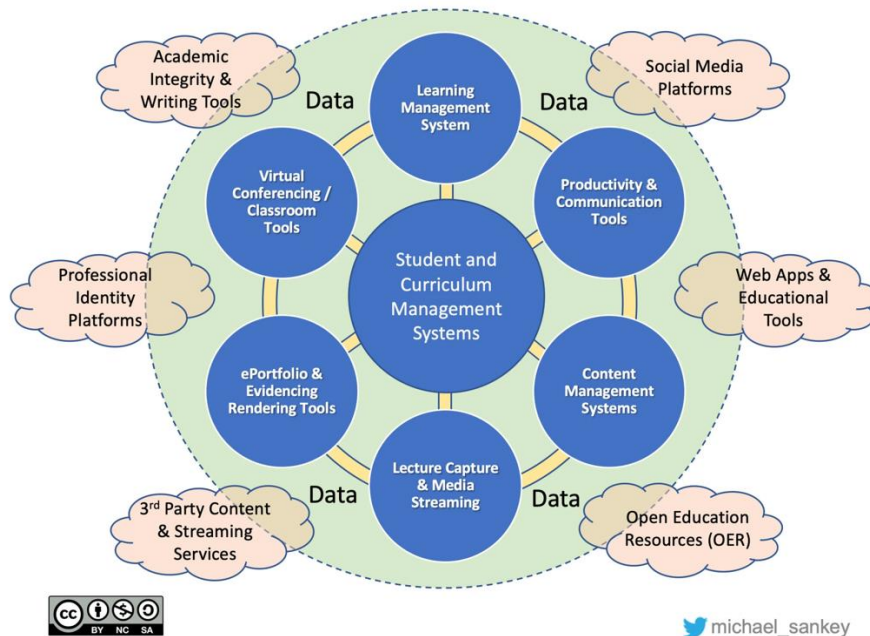
Given the significance of choosing a new LMS that presumably would be in place for at least the next five years, one must consider how a contemporary university might evolve over that time to meet the future needs of its students and staff. This is not a new thought, as Brown (2017) considered, seeing the complexity of the evolution of university learning environments as a web of systems enabling course material delivery, content discovery and creation, data warehousing, analytics, dashboards, student advising, student progress monitoring, assessment, adaptive learning, social networking, and competency-based learning. This complexity extends further with the need to address an array of requirements, including accessibility and universal design, collaboration, personalisation, and interoperability (Marshall & Sankey, 2023). This thought is further supported by (Pomerantz et al., 2018), who suggest that when reviewing the LMS, one must look to support the interoperability of a suite of tools and function as the portal within which students experience their learning journey.

To exemplify this, the LMS now functions more like a sophisticated networking tool, with its future reliant on its ability to interoperate with other systems, rather than being an end in itself (Sankey, 2023). Figure 2 suggests that the LMS is part of a complex ecosystem of interconnected technologies providing a range of services to faculty, students, and universities (Sankey, 2023). Common connections include systems that mediate content management, including copyright compliance, visual media recording and delivery, assessment and feedback processes, student records management, collaboration tools, social media, and student services and support. Interestingly, and more recently, the technology making significant inroads into academic practices has been the advent of productivity and communication tools, such as Office 365, Teams, Slack and Trello. Perhaps most important is the use of environments that facilitate synchronous collaboration, such as Zoom, Teams, and Class (Hill, 2021). Beyond this, a vast array of general and educational tools and services are available from hundreds of vendors that can be used by staff and students to enhance learning activities and assessments. These include media streaming and lecture recording platforms, virtual classrooms, collaboration tools, plagiarism checking, ePortfolio, voice interaction, peer-review/learning, brainstorming, and interoperable objects (e.g., H5P).

However, more recently and since this LMS Review was completed, innovative technologies such as Generative AI have appeared, promoting institutions to review their suite of tools and approaches to assessment. More importantly, consider how these different tools may be used in concert to both creatively enhance and, in some cases remediate the effects of Generative AI (Goel et.al., 2024). It is understanding the value these technologies add to the learner's environment and the ability to change their perceptions of learning that is key here (Sankey, Huijser, Fitzgerald, 2023). However, the systems themselves do not fundamentally change other than incorporating AI affordances, although some of the names of the tools may differ depending on which tools the university chooses to associate with their LMS.

**Figure 2.** *The ecology of tools used for technology-enhanced learning (Sankey, 2019)*

## A Contemporary Technology Enhanced Learning (TEL) Ecology



### **Current Market and the Future of the LMS**

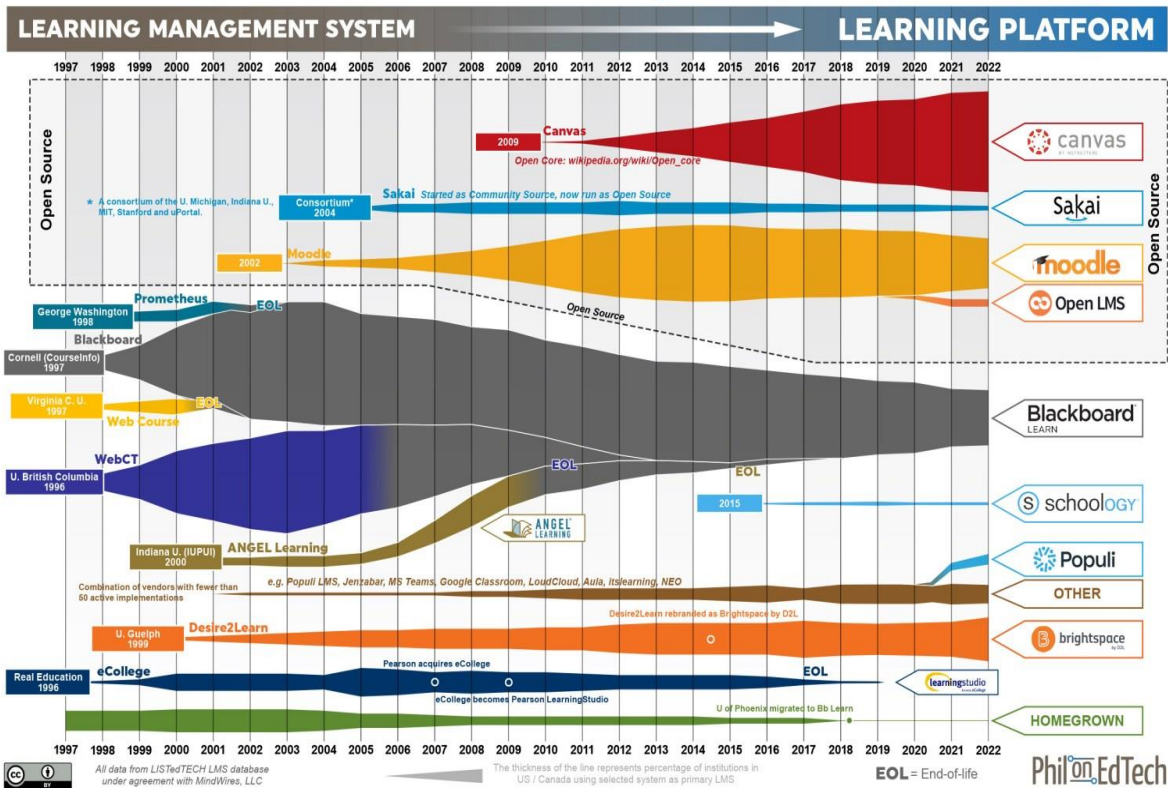
If viewed from a global perspective, there is movement in the US and Canadian LMS marketplace that demonstrates a decrease in Blackboard's (now Anthology) market share and an increase in the Canvas LMS. This shift has also been seen in the Australian market. Figure 3 illustrates the LMS Market Share for US and Canadian Higher Ed Institutions to year-end 2022 (as of February 2024 the 2023 was not yet available). It highlights the story of the market over time. In viewing this, the graphic's key is that each band's width represents the percentage of institutions using a particular LMS as its primary system. It clearly illustrated the rapid rise of Canvas in the market and the narrowing of institutions that use Blackboard as their primary LMS. It also demonstrated Moodle's consolidated but narrowing position, with little change in recent years.

Commentary and analysis suggested that the rise of Canvas was partly linked to their operating environment as it was established as the first cloud-hosted LMS offering a Software as A Service (SaaS) model (Marachi & Quill, 2020). This meant they could leverage that context to provide patches and fixes regularly instead of annual upgrades. Furthermore, it also provided an opportunity to explore rapid software development cycles to address issues and release new features. Blackboard meanwhile continued to operate three hosting models until 2015, when they partnered with AWS to shift to the cloud and eventually to a SaaS model (AWS, 2017). Since this transition, Blackboard has released Blackboard Learn Ultra and shifted the majority of their institutions to the cloud and SaaS as have BrightSpace (D2L) and various Moodle Partners.

**Figure 3.** *LMS Market for US and Canada combined ending 2022 - Creative Commons Licence 4.0 Higher Ed LMS Implementation per Year North America and Europe Combined (Phil, 2022).*

# LMS Market Share For US & Canadian Higher Ed Institutions

YEAR-END 2022  
EDITION



## Inconsistent research on LMS reviews

Research into LMS reviews is quite limited, and internet searchers mostly surface vendor documents espousing the virtues of their particular systems, which is interesting given the LMS 'is one of the largest technology investments made by a higher education institution' (Heathcote & Palmer, 2016. P.261). Even though there is limited attention to the actual process, tangentially others, such as Turnbull et al. (2021), found seven key themes in their comparative analysis of LMS reviews between Australia and China. They found that LMS selection and non-financial factors, diverse LMS deployment in Australia, the emergence of MOOCs in China, cultural influences on LMS usage, online learning's social aspects, expectations of learners and faculty, and obstacles to online learning were critical in the identification and synthesis of factors influencing LMS integration in both countries. On the other hand, Lawler (2011) noticed that LMS reviews do not need to be so rigid. Instead, their organic-based approach favoured trust and empowerment of quality LMS staff that prioritised students and staff. Their research was perhaps against the standardised managerial approaches to LMS reviews, arguing against technical checklists for effective LMS implementation.

It should also be noted that much has changed in 12 years, with a much greater emphasis being placed on the interoperability of tools associated with SaaS-based LMSs (Sankey & Marshall, 2023). For example, a gap within known LMS literature identifies that no LMS provider had a tool that could aid in conducting laboratory experiments for distance learning, critical engineering and science courses (Aldiab et al., 2019). However, laboratory experimentation within Moodle using Netlab was seen as a critical success factor in the University of South Australia's LMS review

when they analysed the top 10 LMSs concerning compatibility, usefulness, security, accessibility, scalability, stability, and design (Ghosh et al., 2019). Further, others, such as Dreamson et al. (2017), and within the Australian context, argued that LMSs do not offer cultural inclusivity for Indigenous students and staff.

While conceptual frameworks are quite common in LMS reviews, perhaps the most common and most widely cited framework utilised regarding technology adoption would be the Extended Technology Acceptance Model (TAM), which identifies ease of use and usefulness as the two critical factors for any LMS adoption alongside self-efficacy and other facilitating conditions (Altinpulluk & Kesim, 2021; Fearnley & Amora, 2020). Self-efficacy is also identified as a critical factor in LMS engagement (Broadbent, 2016). While this research only briefly discussed the LMS landscape of various providers, the University of Windsor have undertaken a very comprehensive guide regarding an LMS environmental scan and suggested this be a good starting point for others who are considering an LMS review (Dhillon et al., 2022). Another overlooked aspect of the LMS review process is reviewing the policies associated with its use that go beyond IT-related use (Turnbull et al., 2022). Their findings indicate the need for dedicated policies to govern these complex techno-social systems (Turnbull et al., 2022).

### ***Interaction***

Interaction and engagement remain key components of a next-generation digital learning environment. A plethora of research indicates that the more students interact with an LMS concerning the content, each other, and the instructor, the better their grade performance (Dennen et al., 2007; Kara, 2020; Oyarzun et al., 2018; Xiao, 2017). Evidence also shows that the more experience students have with an LMS, the more likely they are to take full advantage of their functionalities concerning content, instructors, and their peers (Costley et al., 2021; Dennen et al., 2007). However, the interactions between the learner in the LMS and their peers, content and instructor were not all the same, suggesting the most robust relationship is with learner and content, with the least being learner-to-instructor interactions (Costley et al., 2021). Nevertheless, the more staff spent time with students showing them the features, capabilities, and use of the LMS led to positive learner outcomes; notwithstanding, once students become comfortable with the LMS systems and use cases, then the positive effects of learner-to-instructor are mitigated as many of the features of the LMS extend the role of the teacher (Costley et al., 2021). Research also suggests that when conducting an LMS review, one must involve changes to the user's identity (Delahunty et al., 2014). For instance, staff more used to traditional teaching or using an LMS merely as a resource bank struggled more when confronted with a new LMS environment (Kwon et al., 2021). One identified solution is that the learner/instructor relationship in the LMS needs to be reimagined, whereby students and staff are co-designers and co-participants of a learning network (Dreamson, 2020). That is, the organisation of an LMS and the learner's instruction on actively engaging with the LMS and associated online tools were critical factors in engaging a new learning identity and LMS community (Kwon et al., 2021; Santiago et al., 2020).

### ***Training Considerations***

A critical factor of any LMS review process, regardless of the university staying with or leaving its current provider, is to ensure that both staff and students are adequately trained in LMS functionality to promote learner-to-learner collaboration, learner-to-instructor connectedness and



learner-to-content usefulness and capability (Rhode, et.al., 2017; Moore, 1989). Concerning other forms of training such as micro-credentials, short courses, and modular learning for regional, rural, and remote learners, there was anecdotal evidence within the university that there is a pressing need to ensure the LMS provides support that does not have a specific start and end date that can sufficiently be managed and catered for, including a payment pathway (Macnaughton & Medinsky, 2015). Another training consideration regarding rural and remote users is that an LMS needs to offer a gateway for increased regional partnerships, employer recognition, and self-paced flexibility (Tinsley et al., 2022).

By extension, a key regulatory and pedagogical feature of the LMS is that it can make it easy to promote an alignment between learning outcomes, activities, and assessment tasks (Lai & Sanusi, 2014). Once achieved, the LMS can facilitate a more authentic assessment that promotes meaningful training, as it can promote an emotional link to content, offer temporal contexts, provoke in-time decision-making consequences, and engage video and audio materials (Way et al., 2021). Hence, the LMS must support these emerging training considerations.

### ***Analytics***

For the contemporary institution, the informed use of predictive, business, and learning analytics for process automation, transparency, personalisation, and as an identifier of students at risk are fundamental when considered for any LMS. This extends to not only the storage and synthesis of data but to the transfer of data into graph visualisations for staff to extract quickly to analyse trends, cohorts, and demographics (Jones & Fitzgerald, 2023). Of importance, as seen in Figure 2, is how other systems (CRMs, SIS, Survey systems, etc.) interact with the LMS and how learning activities should be reported between different technical systems. Recent research into LMS-Learning Analytics integrations outlines that 'in general, researchers do not describe their process of data integration in enough detail (or at all)' (Samuelsen et al., 2019, p. 19).

### ***Universal Design***

Underpinned the productive use of today's LMS is a consideration of Universal Design that fosters multiple means of representation, expression, and engagement of concepts (Kang, et.al., 2024). This may involve customising the display of information and offering alternatives to auditory and visual forms of communication, the ability to support varied languages in writing and display through the support of various languages. Similarly, the LMS of choice must consider optimising access to tools via assistive technologies (text-to-speech or speech-to-text) (Carrington et al., 2020). This extends to the need to apply this understanding to the development of micro-credentials, short courses, and modular learning for remote learners and to align learning outcomes, activities, and assessment tasks, as critical components of contemporary teaching.

Finally, Universal Design for Learning (UDL) and User Experience (UX) design are particularly important where the main form of instruction is facilitated online to foster multiple means of representation, expression, and engagement and offer authentic assessments and learning analytics for process automation and transparency (Lehong et al., 2024). An imperative to this literature review is that these ethical considerations should be taken seriously in any LMS Review.

### ***Socio-emotive Learning***

Increasingly, higher education learning (including online learning) should be linked to emotional and social activity to ensure deeper levels of learning (Nugent et al., 2019). While most LMS

providers offer learner interaction tools (chat rooms, discussion forums, email communications and notifications), there is high dependence on the role the instructor plays to use these features effectively, to ensure students are not passive bystanders in their learning (Halverson & Graham, 2019; Ouyang & Chang 2019). Hence, creating socially active, flexible, and collaborative learning activities requires both teacher training and the LMS platform to make it as easy as possible for the teacher and students to engage in these activities. To develop rich discussions, well-planned asynchronous (vlogging) and synchronous activities (live polling) and meaningful and authentic connections between learners (Quaye & Johnson 2016) are now minimum requirements in any LMS platform.

### ***Social Media and Usability***

Notwithstanding, other evidence indicates that due to the ease of use of social media platforms (Facebook groups), traditional forms of forced interaction do not offer meaningful peer-to-peer engagement on any LMS (Izmirli, 2017). Izmirli suggests that an LMS provider should incorporate social media forms of engagement that mirror conversational-style messages on smartphones, social media, and online group workspaces. The review identified that there needs to be a heightened focus on the interaction with students within the LMS, as experienced learners are more likely to take full advantage of LMS functionalities, with the opposite being true for less experienced learners. However, the strength of the relationship between learners and different LMS components varies, with the strongest correlation being with content and the weakest being with instructors. However, although Discussion Forums have been a mainstay of LMS use for more than two decades, there is limited functionality that mimics social media. Many institutions instead have opted for tools to associate with the LMS, such as Microsoft Team or Slack, that are seen to be tools for collaboration primarily, and it is these tools many universities in Australia are turning to (Norman et al., 2022).

## **Conceptual Framing of the LMS Review**

When considering an LMS review it is hard to go past the Next Generation Digital Learning Environments (NGDLE) literature, proposed by EDUCAUSE (Brown, 2017), as a good starting point. However, moves to more social-based learning, particularly since COVID-19, would indicate that one should also link this with a Community of Inquiry (CoI) Framework and engage all institutional stakeholders in the review process (Cleveland-Innes, 2024). The CoI framework is a widely recognised, tested, and respected approach to online education, that aims to create a collaborative and interactive learning environment. This was particularly important for the context of the review being conducted at CDU, as 70% of the learning and teaching occurs online.

The CoI framework places three factors towards an optimal educational experience: having a teaching presence, a cognitive presence, and a social presence (Cleveland-Innes, 2024). For instance, social presence consists of the capacity of communication between the teacher and learners, their interactions, and the extent of community camaraderie towards belongingness. Social presence is so critical to the educational experience that it must occur before the other two domains can be conceptualised and implemented in practice. Teaching presence and the visibility of the educator within the online environment equally must be well balanced to offer adequate, timely and targeted support when needed, e.g., at the start of the teaching period, around assessment times, and throughout the teaching and learning experience as needed. It is

important to note that Garrison-Innes (2019) deliberately chose the term 'teaching presence' over 'teacher presence' to reflect the social-constructivist foundations of the COI that recognises that teaching and facilitating learning can be roles shared by both teachers and students (Cleveland-Innes, 2019). Cognitive presence refers to the ability of students to engage in critical thinking and problem-solving activities within the online environment. This important element of the teaching and learning experience peaks when both social presence and teaching presence are optimal.

Relevant to this review, an LMS must be able to support a balance of all three “presences”, which may be achieved through course materials, discussions, and other activities that require students to process and analyse information, evaluate different viewpoints, and construct new knowledge in a supportive environment. It should be able to provide tools that support social presence and enhance feelings of connectedness and interaction that students experience within the online community. This is promoted through tools such as discussion forums, video conferencing, and social media, which allow students to communicate and collaborate in real time (synchronously) or later, through recording (asynchronously). Equally, tools to promote teaching presence for educators to facilitate and guide the learning process were deemed important.

During the LMS review, participants (teachers, students and support staff) identified several aspirational needs to future-proof the learning environment, including adaptive learning and an instructors' ability to teach without software constraints. The review also highlighted the importance of functional requirement themes supporting interoperability, personalisation, accessibility, and the application of UDL. Among these themes, accessibility and UDL were the only future requirements unanimously rated as necessary. To meet these needs, the LMS had to integrate with other systems, support custom tools, enable delegated system administration tasks, and provide robust learning analytics. It also needed to comply with accessibility standards, offer options for managing different learning materials, and maximise the principles of UDL by providing multiple means of engagement, representation, and expression.

When looking at the user sentiment and feedback from the key stakeholders, these were organised according to the NGDLE requirement categories and were included in the resultant invitation for vendor responses in Phase 2 – Stage 1 of the LMS review.

## **A Critical Analysis of the LMS Review**

To critically reflect on and frame the analysis of the LMS Review process, it is important to develop research questions to assist in this reflection. The first research question to be answered was:

*What considerations must be addressed when conducting an LMS review and when planning for a transition?*

### **Phase 1 Establish Case for an LMS Review**

The case for a review was supported by several conditions identified at CDU, including:

- a mixed experiences with the LMS among educators,
- perceptions of a visually outdated appearance of the legacy LMS experience,
- the high cost of licensing compared to other available options in the market,

- inadequate support for VET/TAFE course structures,
- resistance to transitioning and the need to improve collaboration,
- assessment, grading, and feedback functionalities within the LMS.

With these considerations a two-phase / three-stage LMS review approach was conceived and implemented (Figure 1).

Through the LMS review process, CDU identified an opportunity to provide a more contemporary LMS experience to educators and students.

## **Scoping**

Scoping is a crucial process essential to any LMS review, to ensure stakeholder needs are met and that the project stays within defined parameters. It describes the items that are in scope and not in scope, as well as the impact and deliverables of the project. For instance, implementing a new LMS will provide a more modern, user-friendly platform that meets the needs of CDU's next-generation digital teaching and learning ecosystem. A new LMS should provide opportunities to improve collaboration, assessment, grading, and feedback capabilities and better support VET/TAFE course structures.

Furthermore, implementing a new LMS could help future-proof CDU and save licensing costs. Notably, the scoping process enables the identification of the project's boundaries, thereby allowing a clear definition of what is required and what is not. This articulates the project team, project planning and management, and ultimately increases the chances of a successful implementation. It involves mapping aspirational needs and user sentiment to requirements aligned with the university's Strategic Plan.

In scope was to provide for seamless integration with other university systems and learning applications, robust learning analytics, support for social and cognitive learning experiences and options to elevate the student and teaching presence in the online learning environment. In addition, aspirational needs were identified that included, the ability to support different types of materials, the importance of accessible content creation and organisation, as well as integration with other tools and utilities. In these latter requirements, principles of UDL and accessibility were highlighted.

Seven broad areas of need emerged, aligning well with the NGDLE framework (EDUCAUSE, 2018).

1. Capability for learning outcomes alignment to assessment tasks and content: This means the LMS can align learning outcomes, assessment tasks, and content so that assessment tasks may be more valid measures of student learning.
2. The LMS seamlessly integrates with other university systems and learning applications.
3. Robust learning analytics that can provide insight and actionable data to support continuous improvement and monitor student learning and success.

4. Support for social and cognitive learning experiences, meaning the LMS should allow for collaboration and interaction between students and facilitate the development of critical thinking and problem-solving skills.
5. Provides opportunities for active learning through group work, collaboration, peer evaluation, and discussion.
6. Support options to elevate the student and teaching presence in the online learning environment and support learner-to-learner interaction and learner-to-teacher interaction.
7. Support for short-form courses/units, including completion of study and issue of award from the LMS.

### **Phase 1 Stage 1: Survey Students and staff**

To help establish reliable base data, a quantitative and qualitative evaluation survey was established for staff n=262 and students n=4075. Through this, initial affordances and pain points were identified, e.g., what was helpful vs unhelpful about the LMS. This data then informed a series of focus groups with relevant stakeholders. This resulted in establishing a suite of aspirational needs, of which 389 discrete functional requirements were identified. These requirements were organised into the following five functional categories:

- 1) Accessibility
- 2) Educator
- 3) Student
- 4) Administrator
- 5) Training.

In terms of educator needs, content and learning resources must be easy to create, upload, establish and publish. They must be able to be organised by individual items or placed into folders (with folder depth limited to no more than three layers) and can be easily moved and re-arranged by simple click-and-drag options. They should link seamlessly to content and other tools and utilities that are part of the ecosystem. Visual layout was important, meaning text, images, and other content could be presented in tables or through other options.

Educators also required the LMS to be structured, sequenced, or have conditions applied that determine the availability of content (e.g., reviewed, threshold standards, date, performance, competencies). Regarding communication, Educators wanted discussion boards where topics and threads could be organised and where discussion notifications and response counts could be visible to support the management of discussion. Educators wanted to be able to message an individual, groups of individuals or all members.

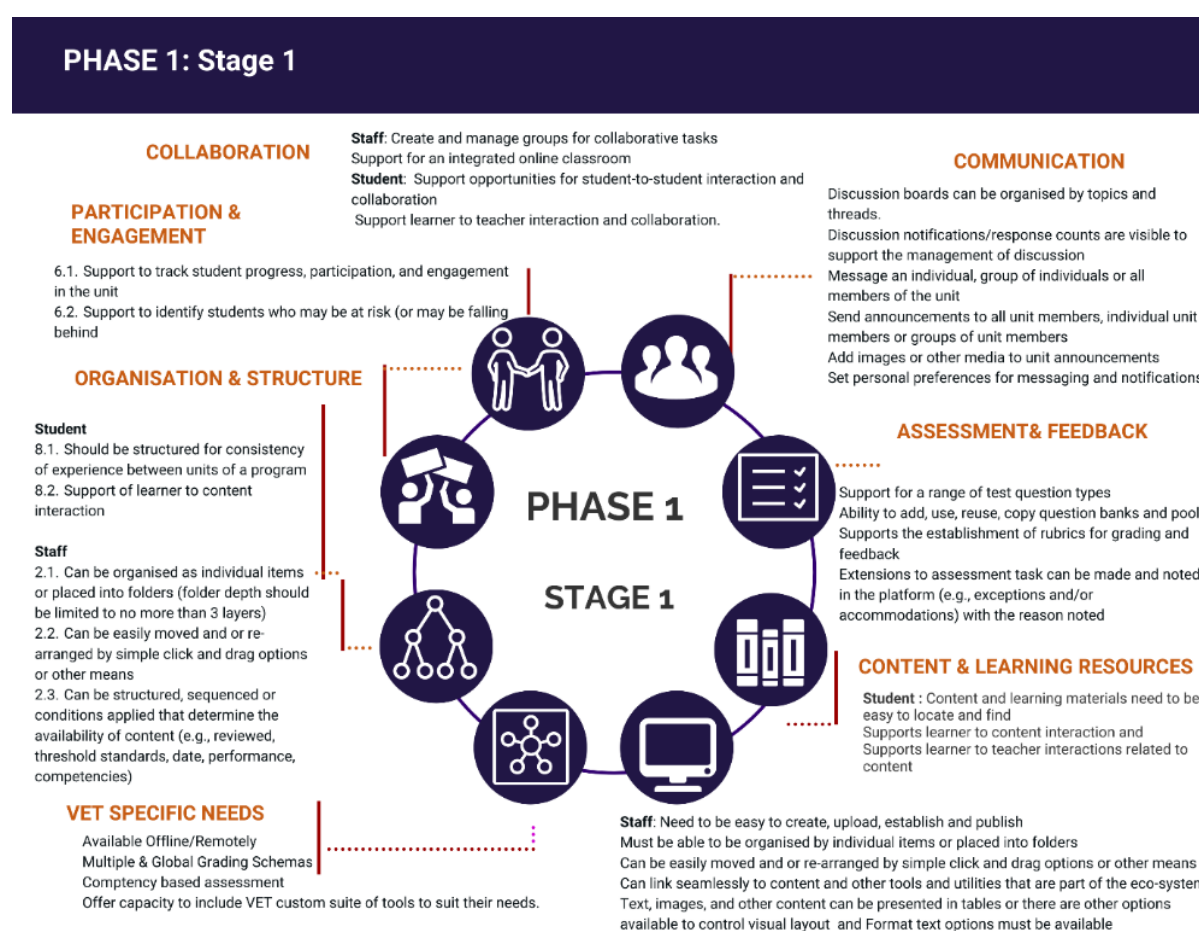
The ability to add images or other media to unit announcements and set personal preferences for messaging and notifications was important. Regarding collaboration, educators require the ability to create and manage groups for collaborative tasks, and support for an integrated online classroom. Lastly, for assessment and feedback, there was a requirement to support for a range of test question types, the ability to add, use, reuse, and copy question banks and pools, and support for establishing rubrics for grading and feedback. This included extensions to assessment tasks that could be made and noted in the platform (e.g., exceptions and accommodations) with the reason noted.

In addition to the educator requirements, the LMS review identified specific student requirements when interacting with the learning environment. These requirements were not as extensive as the educator requirements but included:

- 1) An intuitive and easy-to-navigate LMS with learning resources that are easy to locate and access.
- 2) The learning environment should support learner-to-content interactions and learner-to-teacher interactions related to content.
- 3) To ensure consistency of experience between program units, the LMS should be structured consistently.
- 4) Opportunities for student-to-student interaction and collaboration, as well as learner-to-teacher interaction and collaboration.

A summary of student and staff requirements is illustrated in Figure 4 below.

**Figure 4. Stage 1 of Phase 1: Educator and Student Requirements**



### Phase 1 Stage 2: Consult with Partner Institution

A Microsoft Excel document was tabulated outlining the different considerations that were addressed by other universities that had recently undergone a review, using publicly available data. This included the University of Central Florida, Griffith University, University of Technology Sydney, National University of Singapore, Northern Illinois University and Buffalo University in the United States. Through this, common themes emerged that were consistent in all LMS reviews,

including at least four of the eight requirements outlined in Stage 1. This triangulation of data ensured that the requirements were consistent with other LMS reviews.

It should be noted that the current LMS review reported here was more extensive than all other publicly available LMS reviews. In this case, Phase 1 of the review suggested that academic staff were more uncertain about the suitability of the current LMS, while students were more ambivalent. Thus, more due diligence was required, authorising Phase 2 to proceed.

This data from Phase 1 was shared with the partner institution, who had undertaken a similar process, and with the external consultant, who had advised in the setting up of the categories and surveys used by both institutions. The CDU data was further validated through this process. However, at this point, the partner institution decided not to progress to Phase 2, but rather decided to remain with their existing system.

## **Phase 2**

The next iteration of the LMS review process involved shortlisting potential LMS vendors based on their submissions against the functional requirements established in Phase 1. Vendors were selected to demonstrate how their LMS could address a range of very contextualised scenarios relevant to the university and aligned with the data gleaned from the staff and student surveys, and focus groups, including pain points.

Working together with key stakeholders, the project team co-designed personas and scenarios that presented many of the key problems, challenges and teaching and learning aspirations that were critical to ensuring a fit-for-purpose LMS. This needed to answer the fundamental question, “should we stay, or should we go?”

The eight scenarios included:

1. Multi-campus and hybrid learning
2. Large student cohort
3. Student Progression
4. VET / TAFE Scenario
5. AI and the LMS
6. System Administration Scenario
7. Short Courses in the LMS
8. STEM and the LMS

Each vendor was then required to demonstrate how their LMS could meet the stated requirements in the scenarios (Stage 4), and their demonstrations were scored by members of the LMS Review Group. An ‘*LMS Review Kit*’, which is a collection of these case scenarios, is openly published through creative commons attribution / non-commercial use at <https://cduebooks.pressbooks.pub/lmsreview/>. This link aims to support other institutions that will enter this phase of an LMS review.

## **Decision Making: Soft Transition**

The LMS Review Group, consisting of a senior learning and teaching staff, sought to assess the extent to which the existing LMS supported CDUs' current and future objectives as assessed in consultation with university partners, university benchmarks, students, staff, and alternative vendors. The review considered a range of evidence (user feedback, evaluation of sector trends, vendor responses to information, demonstrations, and university strategic directions) to inform the decision to be communicated to university leadership.

In this case, the LMS Review Group, in collaboration with Senior Management decided not to transition to an alternative LMS. In doing so it was made clear that the university would rather consolidate its approach to its online units. As such, all units currently delivered on the current LMS would be updated and transitioned to a newer version of the LMS. A project to support this soft transition was established with oversight being provided by the centralised digital learning team. The transition project would also build new integrations to seamlessly transition from the old version to the new. Furthermore, the review needed to identify the units and courses required for transition, prepare a transition plan, and migrate all units to the new LMS experience. It also planned to review the training needs for the newer LMS, prepare a training plan, identify the resources required, and implement a training and transition plan. As a result, a step-by-step checklist to assist in this process was developed (Figure 5).

It should be noted that the functional disparity between top-tier LMS providers is marginal, often not exceeding a 5% variance in capabilities, which does not justify the substantial costs associated with transitioning to a new system. It may be more beneficial for universities to invest in enhancing existing support structures, customisation levels, and LTI interoperability's, as well as critically assessing the array of third-party tools integrated into the LMS, to drive meaningful improvements in the digital learning experience of their staff and students.

## **The Opportunity for Consistency**

While a decision was made not to transition to a new LMS vendor, the LMS Review Group took this as an opportunity to improve institutional consistency and make a soft transition to the modernised version of its existing LMS. There was also an opportunity to uplift learning and teaching practice and ensure that all units of study (known as courses at some universities) had an online presence, to take full advantage of the affordances provided by a consistent LMS experience. In 2023, 1619 CDU units (subjects) from HE and TAFE were offered online and had a presence in the LMS. Of those, a significant proportion across the university had already transitioned to the new LMS experience. However, several areas of the university had not yet made the change, and it was these areas that required attention to improve consistency and fully realise the opportunity. As part of the decision any new units emerging would only be made available in the newer LMS version. This mitigated any requirement for later transition and helped assure both quality and consistency in the online learning experience.

Once a decision to transition was made, the next stage was to address several key questions:

- What has worked and what has not?
- What systems and integrations work needs to be done?



- Can we agree on a standard design template that meets the needs of all stakeholders?
- Have the main issues identified in the LMS review phase one been mitigated or met?
- How has the roadmap progressed since the review?
- Are there any opportunities to consolidate the education technology ecology?
- Does the LMS/TEL ecology support current and future assessment practice?

Answering these questions helped align the experience for all users but also created an opportunity for faculty, educators, professional staff, and business areas to come together to improve our systems, processes, and experiences. A considerable amount of support and dedicated time was needed to make the soft transition, offer staff development and training, revisit learning and assessment design, and explore and enable tools and utilities in the LMS, currently not deployed. This would include a review of current systems processes. The opportunity to move the whole institution to a modernised LMS experience also presented affordances in how it supported recent advances in generative AI. The increased focus on authentic assessment and academic integrity impacting learning and teaching practice also helped rationalise our efforts towards a singular and consistent LMS platform. This led to a second of the two research questions needing to be answered:

*What steps and checkpoints must be considered when conducting an LMS review that recommends considering a transition?*

Once the LMS review decided to make a soft transition to a modernised version, determining the best approach was the key to meeting deadlines to support the transition. Six options are provided here to help others initiate the transition process depending on the time, resources, and budget to transition. These options are explained in more detail in Figure 5 and include:

1. A discipline-based approach
2. An enrolment approach
3. A cohort-based approach
4. A feedback and data approach
5. An opt-in approach
6. Any combination and/or all of the above.

The proposed options are advised for any university conducting an LMS review that results in a transition decision, and when considering “what’s next?”.

**A discipline-based approach** involves units that are transitioned by discipline area. That is, all units associated with the accounting discipline are transitioned over the unit development period and made available to students in the next teaching period.

**The enrolment approach** identifies units by enrolment to determine the risk associated with the transition. Smaller enrolment cohorts typically have a lower risk than higher enrolment cohorts and may be suited to transition earlier than units with large enrolment.

There is also the option for a **cohort-based approach**. This approach selects units based on minimising access to two different unit experiences. This may include, for example, all first-year units followed by all second-year units or Postgraduate followed by Undergraduate. This approach has a greater resource requirement due to transitioning all units at the initiation phase.

Another approach could be a **feedback and data approach**. This approach draws on feedback, evaluation data and learning analytics data used to target units for transition. This approach targets units based on content, tools utilisation, navigation, and archetype in response to student feedback.

With faculty support, there could also be an **opt-in approach**. Lecturers are provided with the opportunity to volunteer units for transition. This option requires a firm transition date for all units to work towards.

There also could be a **combination or staggered approach** of any of the above combinations. Key decisions were made concerning the development approach - unit conversion vs unit re-development or a combination of both. While conversion options continue to be improved, key areas of risk regarding unit conversion need to be identified and mitigated. While unit conversion supports a more rapid approach to transition, the complexity of unit content, navigation and, in some cases, the pedagogical approach may be better suited to unit re-development. More resource-intensive unit re-development will result in a far better user experience than unit conversion and presents the opportunity to take full advantage of the affordances provided by the LMS. It is proposed that these options may well apply to either a soft transition like ours or a full transition to another LMS altogether.

A summary step-by-step checklist of all critical points of an LMS review, including transitioning considerations, can be seen in Figure 5.

**Figure 5:** LMS Review Step-by-Step Checklist for Phases 1 and 2

Learning Management System Review	
Step-by-Step Checklist	
Phase 1: Consultation and User Experience with the Current LMS	
Essential Steps	Value Adds
1. Communications – involve staff and student stakeholders and be transparent throughout the LMS review.	<ul style="list-style-type: none"> <li>• We had a student digital experience project underway, and they collaborated on the delivery of the student focus group sessions.</li> <li>• Establish guiding principles for the LMS Review and communicate these.</li> </ul>
2. Conduct sector benchmarks and monitor movement trends – to further inform your choice of LMS.	<ul style="list-style-type: none"> <li>• Conduct review jointly with a similar university, adds face validity and generalisability of findings.</li> </ul>
3. Run staff & students qualitative & quantitative surveys to understand the lived experience in the current LMS, identifying pain points.	<ul style="list-style-type: none"> <li>• Student focus groups – using a qualitative deep dive approach, we found this helpful and made sure all faculties were represented.</li> </ul>

4. Consider your TEL eco-system, interoperability, and emerging platforms on an adoption horizon.	<ul style="list-style-type: none"> <li>• Add external consultation for hands-off unbiased guidance and recommendations.</li> </ul>
5. Establish aspirational goals and measures for your university over the next 5+ years – can your LMS support them?	<ul style="list-style-type: none"> <li>• A solid university strategy and enabling transformative teaching and learning plan helped here.</li> </ul>
6. Establish executive buy-in through Sr. Management interviews – knowing what decision triggers are required to rationalise a costly transition is helpful.	<ul style="list-style-type: none"> <li>• Knowing what conditions needed to be met to rationalise a transition was critical. Our executive team made it clear we had to have enough functional gains in teaching and learning to warrant a change to a new LMS.</li> </ul>
7. Analyse your data, work through a range of possible scenarios, summarise and report your findings – be sure to provide evidence-based recommendations.	<ul style="list-style-type: none"> <li>• Using a partner university and an external expert consultant added legitimate credibility and added value to our Phase 1 Report. In our case, it was recommended to advance to Phase 2 with a hands-on vendor comparison.</li> </ul>
8. Present findings and recommendations to governing bodies for decision making.	<ul style="list-style-type: none"> <li>• We had a technology-enhanced learning advisory group (governance authority) and a student digital experience advisory group.</li> </ul>

**Decision 1: Should we stay, or should we go?**

If you stay, Phase 1 is completed, and the LMS review ends.

If you are uncertain or decide to switch LMS, proceed to Phase 2.

**Learning Management System Review**

**Step-by-Step Checklist**

**Phase 2: Vendor Comparison and Selection**

Essential Steps	Value Adds
1. Communications – involve staff and student stakeholders and establish a representative LMS Review Selection Panel.	<ul style="list-style-type: none"> <li>• We sought representatives through an established technology-enhanced learning advisory group (e.g., governance authority) and the University Learning and Teaching Committee (LTC). These committees met regularly.</li> </ul>
2. Keep it evidence-based and use data to shape what you need vendors to respond to.	<ul style="list-style-type: none"> <li>• Revisit pain points from LMS experience survey data to inform functional and aspirational requirements.</li> </ul>
3. Be transparent and update stakeholders.	<ul style="list-style-type: none"> <li>• Ongoing consultation, updates, and support from the student digital experience project team.</li> </ul>
4. Establish Functional Requirements.	<ul style="list-style-type: none"> <li>• Alignment to university learning and teaching plans, technical and aspirational needs. Then followed by a review by university stakeholders.</li> </ul>
5. Invite Vendor submissions.	<ul style="list-style-type: none"> <li>• Monitoring market trends, and sector benchmarking identified four potential vendors.</li> </ul>

6. Score against clear criteria.	<ul style="list-style-type: none"> <li>University procurement processes guided the establishing of criteria and called for submissions from vendors.</li> </ul>
7. Establish Scenarios.	<ul style="list-style-type: none"> <li>Data gathered from user experience surveys, focus groups, and archotyping exercises informed scenarios, as did further reviews with university stakeholders.</li> </ul>
8. Call for vendor demos against scenarios.	<ul style="list-style-type: none"> <li>Our functional requirement scoring shortlisted to 3 vendors.</li> </ul>
9. LMS Review Selection Panel voting.	<ul style="list-style-type: none"> <li>A representative panel attended the demonstrations and voted on the LMS of choice.</li> </ul>
10. Present selection panel recommendation paper to governing bodies.	<ul style="list-style-type: none"> <li>Executive buy-in is helpful. The LMS Review Group was almost evenly split, with a slight lean towards transitioning. However, neither sufficient conditions, budgetary efficiency, nor functional improvements were evidenced for the university executive team to warrant and approve a change of LMS.</li> </ul>

**Decision 2: Which LMS is most fit for purpose?**

- If you stay - Phase 2 is completed, and the current LMS choice is validated.
- If you decide to switch LMS, proceed to Phase 3.

**Phase 3: Planning for Transition** (expect 18-24 months to full transition)

From our own transition experiences (to the LMS modernised version), we suggest considering the following six transition approaches:

- Discipline-based approach:** In the discipline-based approach, units are transitioned by discipline area. For example, all units associated with the accounting discipline are transitioned over the unit development period and made available to students in the next teaching period.
- Enrolment approach:** The enrolment approach identifies units by enrolment to determine the risk associated with the transition. Smaller enrolment cohorts typically have a lower risk than higher enrolment cohorts and may be suited to transition earlier than units with large enrolment.
- Cohort-based approach:** In this approach, units are selected based on minimising access to two different unit experiences. This may include, for example, all first-year units followed by all second-year units or Postgraduate followed by Undergraduate. This approach has a greater resource requirement due to transitioning all units at the initiation phase.
- Feedback and data approach:** This approach draws on feedback and evaluation data and learning analytics data used to target units for transition. This approach targets units based on content, tools utilisation, navigation, and archetype and in response to feedback from students.
- Opt-in approach:** Lecturers are allowed to volunteer units for transition. This option requires a firm transition date for all units to work towards.
- A combination:** Any combination and/or all of the above.

**Resources and Staffing**

In this particular case the soft transition was supported within existing staff resources from Digital Learning Futures, working in partnership with educators and other relevant stakeholders. Integrations, systems development, processes, and other vital work associated with the LMS, SMS, and CMS were considered. The systems and integrations work are key to an efficient,

robust, and sustainable technology-enhanced learning ecosystem and to mitigate manual workarounds. Given the progress to date towards modernising our LMS over the last three years, there has been considerable investment in the development of training, guides, resources, and documentation to support and assist the transition. Additionally, there were educators and professional staff with knowledge and expertise to complement and advocate for the change to our next-version LMS and support fellow colleagues. Support options and complementary expertise, and a refocus of existing resources will be key to helping the transition to be achieved without additional resources.

A caveat of this paper is that we acknowledge that various influences that may be at play that sits outside of an evidence informed decision making process to LMS reviews. While we do not touch on political dynamics, the psychological impact of Fear of Missing Out (FOMO), or the nuances of policy shifts that may drive such decisions, we recognise these as significant factors that are at play and underpin the complex, often non-technical considerations that inform strategic decisions to review, retain, or even replace an LMS. Lastly, the selection and implementation of the LMS were met with a notably positive reception from all stakeholders involved. This affirmative anecdotal feedback from faculty, students, and administrative success of our LMS initiative, with no concerns arising from the soft transition.

## **Conclusion**

This paper outlines the efforts of an Australian university as they undertook their review cycle of a collaborative LMS exercise and shared their experiences of the Two Phase, Four-Stage model they utilised to conduct the review. By proposing a methodology based on this experience and reflecting on its affordances, this paper fills a gap in the literature on best practices for engaging in open, transparent, and courageous conversations with staff and students about their experiences with the LMS. The research design was centred around a critical analysis of a proposed LMS review methodology. It also considered future and aspirational teaching and learning requirements presented, such as the mixed experiences with the current LMS, high licensing costs, inadequate support for observational and competency-based VET/TAFE course structures, and an overall outdated aesthetic appearance.

This research report also offered a practical checklist as well as an *LMS Review Kit* offering possible scenarios for vendors based on our educator, student, and university needs (<https://cduebooks.pressbooks.pub/lmsreview/>). The end goal is to offer a considered LMS review blueprint for other universities to follow, expand upon, and generate further research that may validate this approach within other higher education contexts. While this paper also discussed plans for a soft transition approach at this regional university, further research and reporting is also required outlining how other universities have undergone full transitions to an entirely new learning management system platform.

## **Conflict of Interest**

The authors disclose that they have no actual or perceived conflicts of interest. The authors disclose that they have not received any funding for this manuscript beyond resourcing for academic time at their respective university.

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