Engaging and Retaining Students in Online Learning

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Before the COVID-19 outbreak, universities were already exploring the potential of online education. Colleges and universities throughout the world became more reliant on online learning management systems (LMSs) and videoconferencing tools like 'Zoom' and 'Microsoft Teams' during the 2020-2021 campus' lockdowns. The transition from traditional face-to-face teaching to online learning presented significant difficulties for universities, particularly those that depended heavily on international students. The project reported in this paper was undertaken in Australia in 2021 at the request of a private higher education institution. A new student-centric version of the Moodle learning management system (LMS) was created to maximise the platform's pedagogical, communicative, and informational capabilities. The purpose of this article is to demonstrate how online learning platforms that are flexible, utilise embedded interactive features and resources, and are freely available can enhance and support the delivery of quality online education. The paper discusses how well-designed learning management systems have the capacity to motivate, engage and retain students in online learning. Academics, at both the undergraduate and graduate levels, as well as those working in curriculum development and information technology at institutions of higher learning, may find this article to be of interest and value.

Keywords: online, Moodle, Learning Management System (LMS), pandemic

Introduction

Recent years have seen an adoption by educators and educational experts of active learning styles which stem from a growing understanding of the importance of emotional, behavioural, psychological, and social aspects in the learning process and in students' overall well-being and development. There is almost universal acceptance that 'participative learning', which focuses on the learner is superior to 'didactic learning', which focuses on teacher-presentation of information, for achieving most educational goals.

Against the backdrop of the world-wide pandemic and the mandatory switch to online and remote learning, this paper provides insight into the benefits of development and enhancement of a Moodle learning management system (LMS) which applied a student-centric design to improve the platform's pedagogical, communicative, and informational capabilities. In addition, the paper demonstrates how a well utilised Moodle platform can help teachers motivate, involve, and retain students by providing them with a flexible and publicly accessible online

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learning option. Furthermore, it illustrates how the use of educational technology in the classroom offers numerous opportunities to transition students into active 'learners,' as opposed to passive 'listeners'.

Aim

The aim of the project was to research, consult, design, develop, and implement pedagogically-based improvements to an online Moodle Learning Management System which would provide added support for, and engagement with, online students.

Scope

The project was supported by a competitive grant from the Australia English Fund. The designated funds were intended to encourage and assist English-language universities and colleges in making the shift to online education delivery to maintain their attractiveness to, and retention of, foreign students.

The grant was awarded to an independent Australian higher education provider which commissioned external consultants, with extensive senior-level academic experience directing and working in university-wide centres for learning and teaching, to lead the project. The consultants also drew upon the expertise and advice of a focus group of additional academic colleagues with experience in the field of learning and teaching and advanced technology application in the context of higher education.

Context

During the four months of this investigation, the consequences of the pandemic in Australia almost ground daily life to a standstill. Municipalities, organisations, and educational institutions closed. Few people ventured outside their homes unless under the direst of circumstances. University officials scrambled to keep the institutions operational by offering online and remote support. Many universities, and private higher education providers especially smaller ones, found that they lacked the expertise and infrastructure to swiftly transition to online course delivery. Everybody involved in the sector, from teachers to students, had to deal with a culture that was riddled with ambiguity, uncertainty, and overburdening duties. Many countries reported a rise in mental health illnesses among staff and students who were ill-equipped and underprepared to cope with the rapid transition to online learning and teaching.

Research Question

This paper discusses the importance of creating learning partnerships between academics and students in the online learning space. The specific research question underpinning the project was:

How can a Moodle Learning Management Platform enhance engagement and retention of students in online learning?

Paper Outline

The following items are covered in the body of the paper.

- Review of literature on the theoretical concepts which inform the application of emerging technologies and Learning Management Systems (LMSs) in online learning, teaching and assessment practices.
- Original analysis of previous feedback on Moodle design undertaken in prior teaching activities.
- Section on the mixed methodology used in the project to incrementally develop and review the enhanced Moodle platform.
- Application of the Learning Partnerships in Adult Education (LPAE) approach and the ServQual Framework to inform the enhanced Moodle platform.
- Implementation of the customised Moodle.
- Summary of findings.
- Recommendations.
- Conclusion.
- Reference list.

Review of Literature

The goal of this project was to enhance online teaching and learning in higher education by optimising the potential resources in a Learning Management System to better assist students achieve their academic goals and increase their level of engagement with course material (LMS). Moodle, a free and open-source LMS, was selected for this project because of its ability to provide instructors, support staff, and students with a unified, safe, and adaptable platform on which to build their own unique educational experiences (Moodle Project, 2022; Lungu, 2022).

Martin Dougiamas, an Australian who participated in his country's School of the Air initiative, created Moodle. Children living in remote areas of Australia are the focus of this initiative. Its first implementation took advantage of the two-way radio network already in place within the Royal Flying Doctor Service to link up with students and provide real-time instruction. Satellite and internet technologies are being used to provide the service (Alice Springs School of the Air, 2022).

Moodle was likely influenced and shaped by Dougiamas's own experience with distance learning as a student.

In 2022, Moodle is predicted to have 340 million users enrolled in 42 million courses across 241 countries (Moodle Project, 2022). Moodle's two main selling points are its user-friendliness, thanks to its drag-and-drop interface and its creation of a collaborative learning and teaching environment, centred on the individual needs of each student.

While Moodle was the primary LMS investigated, the literature analysis also looked briefly at other learning management systems with the view that conclusions and anecdotes would hold true across a variety of LMSs, not simply Moodle.

Early Adopters

An example of an early adopter is the Open University of Canada. This organisation made a planned transition to online education which is reported in a collection of essays (Anderson & Elloum, 2004). The essays are organised into the following categories: (1) The Role and Function of Theory in the Design and Delivery of Online Education; (2) Content Development Infrastructure and Support; (3) Online Course Design and Development; and (4) Online Course Delivery, Quality Control, and Student Support.

Three of the topics highlighted during this early phase of the shift to online education were selected for deeper investigation and expansion in this literature study. They provide a brief overview of the primary data, theories, and procedures that served as the basis for the work undertaken in the project.

The Role and Function of Theory in the Design and Delivery of Online Education

According to published works, different pedagogical theories and methods of instruction inform and shape distinct features of online education. The research conducted by Watson, Skinner, Thorndike, and Hull in the early to mid-1900s laid the groundwork for behaviourist theory, which popularised ideas like conditioned response, learning by association, reward and punishment, and aversion treatment (Cherry, 2016). Positive online learning environments, fewer learning obstacles, thanks to simplified online navigation aids, incentives for appropriate replies, opportunities for repeated practise, and other tenets of behaviourism may be found in online education (Kaplan, 2017; 2018).

In learning and formative assessment when the emphasis is on learning and testing knowledge and facts, LMS technologies like online self-paced and timed quizzes, learning drills and computer games, based on behaviourism theory are valuable tools (Ally, 2004; Drew, 2019). The ability to upload recorded lecture files, PowerPoint presentations, video and audio webinars and optional readings are other features of a basic LMS that facilitates access to information.

Piaget and others, like Bruner and Neisser, believed that there was more to learning than what could be seen in terms of stimulus and response behaviours,

and so cognitive learning theory was born (Tennyson & Rasch, 1988; Barrouillet, 2015). Cognitive learning theory is a way of learning that emphasises 'thinking about thinking,' as its name indicates. Some academics have coined the term 'metacognition' to describe this phenomenon (Tanner, 2012). Opportunities for application of content, reflective activities, and deep and critical thinking are of utmost importance in a virtual classroom (Ally, 2004). E-journals, debates, discussion forums, and chat rooms are only some of the online platform features that have been influenced by cognitive theory (Winn et al., 2019).

According to the constructivist philosophy of education, students are not passive recipients of information but rather creators of their own knowledge. Dewey, Vygotsky, Bednar, and von Glasersfeld were among the first to advocate this approach. Learning, according to the constructivist, is not something that just happens. The traditional model of education, in which a teacher acts as a 'sage on the stage' has given way to one in which teachers operate more like 'guides on the side' (King, 1993). The student plays an important role in this framework.

Constructivism advocates for realistic and contextualised curriculum design in online education (Ally, 2004; Bada, 2015). Constructivism-informed online features include those that help students study and problem-solve, simulate real-world employment settings, and include assessments that make use of multi-media resources like recorded videos, narrated slide presentations, and ePortfolios. The creators of Moodle state that they were inspired by social constructivism theory while designing the platform. According to their website, Moodle is founded on the tenets of social constructivism, an educational philosophy that encourages the formation of collaborative groups to build knowledge for one another and form a microculture based on the creation and exchange of cultural artefacts with mutually understood meaning (Moodle Project, 2022).

The philosophy of learner-centred instruction is a development of constructivism. It emphasises the importance of the student's past knowledge, abilities, and experience in the learning process and supports the idea that students are active participants in that process. The demographics and cultural backgrounds of the students being taught are also considered in learner-centred theory (Schweisfurth, 2015).

Learner-centred theory is often aligned with 'humanist' and 'holistic' learning theories whereby one's own development, awareness of one's own ideals and feelings, and actualisation of one's own potential are prioritised (Johnson, 2014). Learners are empowered in a learner-centred approach by being given agency over their own education, encouraged to create their own objectives, and participating in the development of assessment criteria (Gros & López, 2016).

Flipping the classroom is one of the most well-known examples of a learner-centered approach in education. In this scenario, students access weekly assigned readings, videos, lectures, and learning exercises online in advance of each week's planned session. Online class time is used to have lively discussions and engage in collaborative activities that build on the weekly homework activities. The success of the approach depends on the online learning platform being available to all students and being large enough to store the weekly materials. A successful learning management system, whether it is used in a flipped classroom setting or

not, needs to be user-friendly and include features and tools that facilitate and enhance student learning (Akçayır & Akçayır, 2018; Jiang et al., 2020).

Prensky claims that students who have grown up in the digital era have a distinct way of learning. When asked 'how do students learn?' his attention shifts to 'what do they learn?' (Prensky, 2000, p. 156). To paraphrase Prensky's model: Behaviors are best learned through imitation, feedback, and practice; creativity is best learned through play; facts are best learned through association, drill, memory, and questions; judgement is best learned by reviewing cases, asking questions, making choices, and receiving feedback and coaching.

Whether the desired learning outcomes are knowledge-based, skill-based, application-based, or value-driven, this project and other institutions working in the online space face the challenge of ensuring and expanding the functions and features in their online learning management systems to facilitate learning activities and assessment practices which align with the nominated learning outcomes.

Design and Development of Online Courses

Many colleges and universities had already begun using hybrid and online programs prior to the COVID-19, as was highlighted earlier in this review. A case study from the School of Public Health at Columbia University emphasised that online course design, production, and delivery should be seen as an iterative process in which we constantly evaluate what works and improve the procedure, learning activities, and resources (Russell, Kane-Sample, Bhaskar, & Lewis, 2022).

The Columbia experiment recognised, and several papers affirmed, the need for cooperation among teachers, course planners, information technology experts, school officials, and students (Puzziferro & Shelton, 2008). It seems that problems arise when the shift to online education is motivated more by the 'technology' than the 'methodology' (Keengwe & Georgina, 2011). Educational literature repeatedly stresses that the technology available should be used to assist the agreed upon principles and aims, rather than the other way around (Davis, 2004).

Perhaps unexpectedly, a study of the effects of the University of the Pacific's Dental School's quick shift to online courses revealed that student performance was on par with or even higher than pre-pandemic outcomes (Zheng, 2021). The debate on the function of online engagement and interaction included into the curriculum may provide a crucial hint to the rumoured success of the school's transition to online courses. Teachers were urged to increase student-to-student communication and collaboration via the use of the learning platforms' interactive capabilities. Students cited aspects like breakout-room activities, chat sites, discussion forums, polls, and the incorporation of game play using apps, as being particularly helpful in their learning platforms (Zheng, Bender, & Lyon, 2021).

Establishing and maintaining a 'teacher-presence' is crucial in both face-to-face and online learning, according to an article on applying best practice in online learning (Roddy et al., 2017). The authors go on to discuss some of the problems that some students and teachers have when attempting to participate in online

courses due to the inherently unstable nature of the online environment. They refer to the benefit of using synchronous and asynchronous methods for communication, feedback, and engagement, provided by the learning platform, to maintain constant contact and participation with distant students.

Online Course Delivery, Quality Control and Student Support

Academic integrity, privacy, plagiarism and copyright, access and equity, compliance with the regulator's standards, governance, policy, and quality control were identified as sub-topics in a review of the literature under the broad theme of quality assurance of online learning and teaching delivery and infrastructure.

Most articles on academic honesty emphasised the need to include resources to promote scholarly practices in online education and dissemination within the platforms themselves. One strategy was to make sure that all relevant websites have extensive resources on issues like plagiarism, cheating, and copyright. Students at certain institutions were able to use Turnitin and similar plagiarism detection tools before submitting their assignments. Most policies and practices favoured educating over reprimanding and penalising.

Several publications brought attention to the access and equality concerns raised by the sudden shift to online learning that many universities were forced to make because of the pandemic. Lack of access to powerful digital devices and technical infrastructure, such as a dependable and fast internet connection, greatly restricted what could be delivered to students online in low-income and rural locations.

According to research conducted across African institutions, both faculty and students were unprepared for the rapidity and expense of the transformation due to a lack of resources and technological expertise (Vusumuzi, Sisasenkosi, & Sibanda, 2020; Mafugu, 2020). In some regions, only iPads with specific pre-installed apps like WhatsApp, Microsoft Teams, and Telegram were available (Ahmed et al., 2020). Similar difficulties accessing online courses were reported by American university researchers in poor communities (Browning et al., 2021; Ives, 2021). Based on the results of a recent study conducted in Romania, it seems that both the faculty and the students have a long way to go before they are ready for online education (Coman et al., 2022).

Another problem with quality control found in the research was ensuring that online activity complied with standards set by the government regulator and was embedded in suitable rules and procedures. A recent policy statement from the International Association of Universities emphasises the importance of having appropriate structures and policies in place, stating that 'faculty, student, and staff should be engaged, and their needs and perspectives considered to effectively and appropriately use technology in teaching, learning, research, and administration' (IAU, 2022, p. 7). For these shifts to be successful, the institution must be equipped with the resources and infrastructure necessary to steer its transition to digital.

Analysis of Feedback on Prior Moodle Enhancement Activities

In addition to the review of recent, relevant literature, the project was informed by some analysis of the project leader's earlier unpublished research into Moodle enhancement. The analysis reported focuses on feedback received from students who studied a human resource subject online which used an enhanced LMS Moodle platform. Table 1 illustrates the high level of student satisfaction to the following questions.

Table 1. Students' Feedback

	Strongly agree	**Agree**
Satisfied with the quality of the course	41.38%	55.17%
The Moodle course was easy to navigate	31.03%	41.38%
The resources provided supported learning	41.38%	31.03%
The assessment tasks helped my learning	44.83%	27.59%
The requirements of each assessment task were clearly explained	31.03%	34.48%
The feedback given on my assessment helped me to learn	41.48%	34.48%

Of even more significance to this project were the students' responses to the open-ended questions: 'What were the best aspects of the course?' and 'What aspects needed improvement?' With respect to the best aspect of the course, students cited: easy to navigate Moodle site: availability of feedback features: and convenient online access to learning resources. Regarding areas for improvement, students suggested: greater and more frequent use of online forums; more opportunities for live online discussions; and greater teacher presence in delivery of online lectures and narrated slide presentations.

Examples of the type of feedback received from staff and students when using pedagogy which utilised the interactive features of Moodle include:

> 'When I state that this is the only class that has been able to sustain my attention over the whole of the semester, I do not believe that I am exaggerating the situation in any way'. [student feedback]
> 'This is the very first time in my life that I have been exposed to various approaches to teaching'. [student feedback]
> Your Moodle site is really helpful and inviting…a very positive experience for me. [student feedback]
> The 'exceptional multimedia… in the design of the Moodle sites… the organisational framework and visual style … are an exceptionally high standard'. [colleague, Melbourne campus]
> The Course Moodle site meant that 'students could always be empowered to work together and independently towards the achievement of learning objectives. Group work, self- and peer-assessment, and the creation of class newsletters were significant features'. [colleague feedback].

These affirmations and suggestions were carried forwarded into this project.

Methodology

The project plan utilised a mixed-method approach. In addition to the input from the review of literature and feedback from previous development work in Moodle, the project methodology was informed by the Learning Partnerships in Adult Education (LPAE) approach (Sampson & Cohen, 2001), and the ServQual Framework (Wang, Luor, Luarn, & Lu 2015; Yousapronpaiboon, 2014; Abili, Thani, & Afarinandehbin, 2012).

A small focus group of experienced academics, learning and teaching specialists including the Higher Education provider's DVC (Teaching and Learning) and Information Technology Manager was established to inform, trial, and provide feedback on the project.

A team leader with extensive experience working with Moodle was appointed to oversee the project team and liaise with the various stakeholders. The leader drew upon his extensive knowledge of teaching and researching Moodle to design and develop the customised Moodle Platform. The leader also interpreted and incorporated the feedback provided by the focus group during the various development phases.

Phase 1

The initial focus group discussions noted the following high-level points which were used as guiding principles in the development of the enhanced online learning platform.

- the nature of higher education service provision is changing dramatically. Universities and private higher education providers must prioritise service provision for key stakeholders;
- students are key stakeholders and their service–related experiences need to be of a standard which ensures satisfaction;
- student voices and concerns need to be accommodated in a systematic manner, making learning a two-way process rather than a one-way flow of information;
- effort should be given to involving students in everyday social life of the institution in a respectful manner;
- higher education institutions need to be inventive in attracting and retaining students;
- satisfied students contribute to the overall competitive advantage of universities; and,
- research into service quality (moments-of-truth) identifies student satisfaction to be a principal indicator of student retention.

Phase 2

The LPAE approach explicitly emphasises that teaching and learning involve more than the preparation and delivery of course materials to foster engagement

(Healey, Flint, & Harrington, 2014; Cook-Sather, 2020). A key practice in the LPAE approach is to move beyond the preparation and delivery of the course material towards fostering a spirit of collaboration, often referred to as negotiated learning partnerships. Each student is steered towards achieving an identified outcome through regular personal contact and encouragement. Engagement amongst the parties involves building trust, inclusive negotiation, and collaboration. This is viewed as the value-added component. The learning partnership is based on achieving synergy. A synergy where the whole is greater than the individual parts and the collective outcome greater than individual outcomes. Complementarity is a prime aim in LPAE whereby the partnership benefits from the contributions of diverse skillsets, intellectual resources, and accessibility (Cook-Sather & Abbot, 2016; Healey, Flint, & Harrington, 2014).

Phase 3

In this project, learning partnerships were framed and measured by service quality. The definition of quality in services that has been most quoted is that by Parasuraman, Zeithaml, and Berry (1985). Furthermore, Parasuraman, Zeithaml, and Berry (1988) offered SERVQUAL to a wide range of businesses. A tool known as the SERVQUAL was recommended to identify student expectations and measure student perceptions (Salvador-Ferrer, 2010). Expectations refer to what students feel that they should receive in the learning partnership, whilst perceptions refer to what students feel that they have received from the learning partnership. In this project the SERQUAL tool is recommended to assess the gap between student expectations and perceptions about quality online education facilitated by an enhanced Moodle platform. The challenge is to close the gap between expectations and perceptions to secure a commitment to the learning partnership (Akhlaghi, Amini, & Akhlaghi, 2012).

SERVQUAL provides the opportunity to test and analyse student expectations and perceptions in relation to the following dimensions: reliability (confidence in service); assurance; responsiveness; tangibles; and empathy. Figure 1 illustrated the application of SERQUAL to tertiary education and, in this case, was customised for online education.

Figure 1. Application of SERVQUAL Model to Tertiary Education
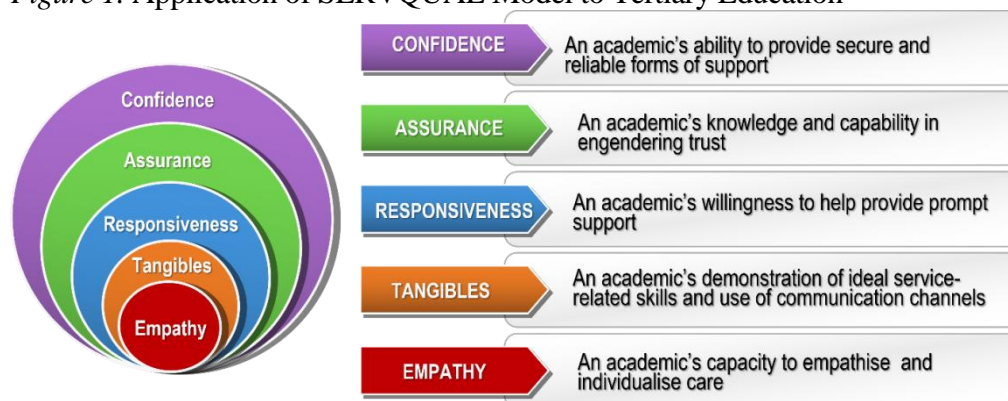
The following section outlines how the SERVQUAL dimensions were applied in the context of a Partnering for Learning Framework in an online Moodle environment.

The first dimension of **confidence** or reliability in service refers to an academic's capacity to provide trustworthy and dependable types of assistance and support for online learning. In terms of Moodle enhancement this relates to the provision and easy access to high-level, attractive, and relevant learning materials such as lecture recordings, lecture slides, learning activities, additional readings, webinars, videos, and online communication tools. The partnership is the tacit agreement between the teacher and student that the teacher will upload the materials and that the student will regularly access them. The built-in flexibility means that students can watch lectures in real-time or work through them at their own pace.

Another simple enhancement to Moodle which helps to build confidence is the use of consistent and self-explanatory icons to facilitate easy navigation around the site. A familiar home page with clear links to areas such as relevant policies, subject outlines, learning outcomes, assessment tasks, important dates, weekly lectures and learning activities reduces student frustration and enquiries.

The second dimension is **assurance**, which refers to the academic's capability as well as their capacity to instill trust. This dimension is linked with the concept of establishing a strong teacher presence online, the need for regular two-way engagement between the lecturer and students. Moodle features which build assurance and trust include various discussion forums, chat rooms and online tools which promote both formal and informal communication. Weekly quizzes, text-based polls and online challenge questions are fun and build an online learning community.

The third dimension is called **responsiveness** and it refers to an academic's desire to assist in providing rapid and prompt support. In an online environment timely and constructive feedback is essential to maintain student engagement and retention. Moodle enhancements to foster effective feedback include feedback boxes, audio, and video feedback, live and recorded feedback, and self and peer feedback. Providing interactive feedback activities in Moodle is another effective way to provide prompt and helpful assistance.

The fourth dimension is called **tangibles** and refers to an academic's ability to demonstrate optimal service-related talents and employ communication channels. In an online environment this means placing the student at the centre of the learning process. Digital learning activities and assessments need to encourage innovation, allow students to explore their interests and enable students to work with the various technologies and tools accessible through Moodle to demonstrate their learning. Group assessments are also facilitated through Moodle through the establishment of group activity spaces. Live and pre-recorded assessments using video, audio, narrated-slide presentations and mixed media presentations appeal to online learners and prepare them for the real-world.

The fifth dimension is **empathy**, which is the ability of an academic to empathise with their students and individualise their care. An issue that online students often raise and refer to in feedback is the sense of isolation and lack of

connection in an online learning environment. Moodle offers several tools to facilitate as sense of connectedness and empathy. Personalised feedback which uses the student's name, prompt response to student's emails queries and set consultation times for informal questions and discussion are some of the ways Moodle can be used to show empathy and build a learning partnership online. Some students in remote areas also have limited access to the web and internet services so consideration needs to be given to how students can participate in online learning using simple digital devices.

Implementation of the Customised Moodle

The elements adopted in the online course design are illustrated in the following two diagrams (Figures 2 and 3). The course Moodle site is designed to make the students learning experience easier. The emphasis of the design is placed on the student's easy access to information and enhancement of interaction. The new, vibrant Moodle design colourfully highlights key pedagogical features of the modules throughout the courses.

The Objectives provide an overview of the topics to be covered in each module, giving a clear indication of what should students expect to learn.
Activities appear throughout each module to reinforce learning with problems and practical exercises.
Diagrams are used to illustrate key points, models, theories, and processes discussed each week.
The weekly module Summary allows students to recap and consolidate understanding of the main points.
Quizzes and questions are provided for self-testing, and class exercises or debates reinforce and apply student learning theory and concepts.

Furthermore, the case studies used in the tutorial activities help consolidate students' learning of major themes by applying them to real-life examples. These activities help equip students with knowledge and skills which will enable them to better address future workplace problems. Check it out (videos clips) are recommended to clarify difficult concepts. Finally, references and further reading are recommended to support the student learning journey and for additional study.
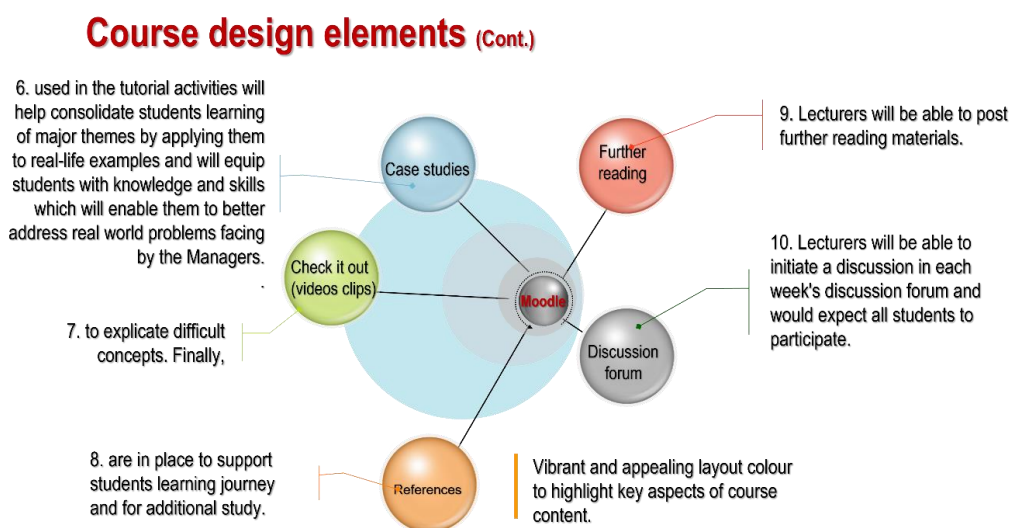
The Moodle site is designed so that lecturers can initiate a discussion in each week's discussion forum with the expectation that students provide their own postings and reflections.

Figure 2. Course Design Elements
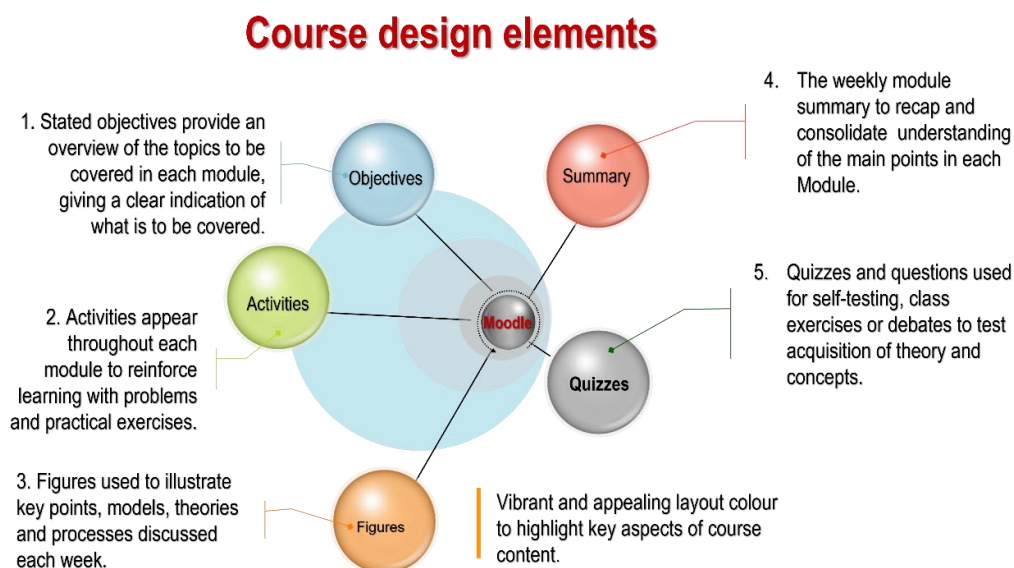
Figure 3. Course Design Elements

Figure 4 provides an illustration of the enhanced Moodle Home Page. The page enables students to effectively navigate the Moodle site through one-click on the appropriate icon from the home page.

Figure 4. New Moodle Design-Key Elements for Course Website

Summary of Findings

This paper reports on a project that was initiated in response to COVID-19 whereby cities, businesses and universities were closed, and education was forced to transition from face-to-face teaching to remote and online learning almost overnight.

The methodology and strategies that underpin the enhancement of the Moodle site adopt a learner-centric approach and is consistent with sound learning pedagogies. The focus on learning as a partnership between student and teacher which was informed by the LPAE model, empowers students to drive their own learning. They are given the autonomy and encouraged to draw upon the learning materials, activities, and resources available on the Moodle site according to their needs and availability. However, it is important to note that their learning is scaffolded and supported and that they are not left to work through the learning material and activities in isolation. Several avenues for interaction, engagement and communication are available on the enhanced site. These tools include discussion forums, chat rooms, feedback boxes, Q&A sites, self-paced quizzes, surveys, and polls. Interaction between student and teacher and student and student is also strongly encouraged and supported through tools such as zoom, groups and teams.

The design and development of the site was significantly influenced by student expectations and the gap between expectations and perceptions referenced in the SERVQUAL model. The elements of confidence, assurance, responsiveness, tangible and empathy, identified in the model are reflected in the enhanced Moodle site. To start with, the site is visually attractive, uses clear and consistent icons, and is easy to navigate. Access to various resources such as lecture notes,

recorded lectures, learning activities, relevant academic policies and procedures, additional readings, and so on are available from the main menus through one click.

Another major advantage of the enhanced Moodle site is that it provides both lecturers and students with a record of student access and activity. This information enables a lecturer to contact individual students as to why they have not logged in to the Moodle site and offer support. This intervention tool is vital in early detection of students who are struggling or need individual assistance. This time of proactive action can have a significant impact on student motivation and retention rates.

The course design elements described in this paper provide guidelines for enhancing learning management systems. Research shows that the rapid shift to online and remote learning during the 2020-2021 pandemic found many higher education institutions under-prepared and under-resourced. The advantage of Moodle is that it is a free access, learning management system, based on a drag-drop strategy which is relatively easy to pick up. The need for student induction and staff profession development is still highly recommended. However, in keeping with the pedagogy adopted in this enhancement project, the induction and training needs to be customised, flexible and relevant. Some students prefer to seek training at the point of need. For example, when ready to submit an assessment online they seek out information on Moodle as to how to upload their submission to the assessment drop box.

Staff training also needs to be flexible and provide options. Peer to peer learning is popular, as are small group training sessions which focus on one aspect at a time. For example, a session on how to create a quiz in Moodle or how to establish a discussion forum.

Recommendations

1. That enhancing a Moodle learning management system platform to optimise its potential for learning should be viewed as a whole-of-organisation project where commitment is demonstrated by all levels of the organisation.
2. That the development of online learning capacity is not viewed as a cost saving strategy but as a valuable addition or alternative to the organisation's suite of education delivery options.
3. That the approach used to enhance a Moodle learning management system platform needs to be based on a partnership or a collaboration amongst the key players. It is important that decisions are based on pedagogical and technology is viewed as the means to achieve the identified learning outcomes, not the driver.
4. That the design and development of the enhanced Moodle site need to place the learner at the centre of decision making.

5. That academic staff have access to range of formal and informal, flexible professional development options to build their online learning technical skills.
6. That moving forward institutions invest in projects that investigate and research online learning platform and how they can be further customised and utilised to optimise learning and teaching in higher education.
7. That feedback from staff and students on the value and effectiveness of the Moodle platform is embedded in a continuous quality assurance plan and strategies for analysing and acting on the feedback are in place.

Conclusion

At the beginning of the paper, mention was made of the fact that online learning and teaching had become a viable form of education in the decade prior to the pandemic. However, the impact of COVID-19 on all aspects of society: work, travel, shopping, sport, entertainment, family life and especially schooling forced the world to find new ways of engaging, working, and learning. The climate shifted education from largely face-to-face learning to almost totally online learning.

The project reported in this paper describes the rationale and strategies adopted to improve the student experience of online learning, and to sustain and retain their motivation and participation in higher education. The project involved enhancing and customising a Moodle Learning Management System by placing the learner at the centre of the design and development.

The outcome was a visually attractive, easy to navigate site which optimised the features accessible through Moodle that underpin and support online learning. The project leader drew upon an extensive review of literature and a 'community of experts and specialists' to complement his extensive academic experience working in and researching the online education space. The final MLS framework owes a great deal to the willingness of online experts from throughout the higher education sector to provide input and discussions, as well as the extensive expertise of the academics involved in this project.

The specific research question asked in this paper was: How can a Moodle Learning Management Platform enhance engagement and retention of students in online learning?

The project demonstrated that there are many ways the Moodle platform can be enhanced to stimulate student engagement, sustain their motivation, and optimise learning opportunities by customising the various communication and learning tools that are available across the platform. However, the recommendations point to the need for further research and development work in the areas of enhancement of online learning management systems. The recommendations cover areas such as: whole-of-organisation commitment; online education an investment in the organisation not a cost saving strategy; online education driven by pedagogy not technology; placing the learner at the centre of online learning; academic staff professional development and the importance of collecting and acting on ongoing feedback from staff and students.

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