

Moodle: An Effective Tool for Creating a Blended Learning Environment in a Nursing Context

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Abstract

Education at tertiary level is constantly changing and evolving as it incorporates newer methodologies and technologies, and more and more colleges and universities are adopting a blended approach to instruction and learning in response to this. The continuous advances and improvements in technology in addition to the increasing competence and confidence of students in using the new technologies makes the transition to a blended learning environment less challenging than in the past. However, as technology improves, the range of options available to select from increases. As online learning has gone more mainstream, it is important to choose an educational Learning Management System (LMS) tailored to an institution's mission and educational goals. This paper will look at one LMS Moodle, and the benefits of adopting it as the primary vehicle for delivering content online, in support of the traditional classroom-based learning, in a nursing university setting.

1 Introduction

Currently, teaching methodology in tertiary education around the world is being heavily influenced by LMS that record the learning behavior of both students and teachers, which in turn are leading to more and more colleges and universities adopting a blended learning approach to the courses they offer. In recent years, technological innovations have had a huge impact on education and the evolution of information and communications technology (ICT) has altered lesson content delivery as well as student learning practices, thus enabling tertiary institutions to create, develop, and deliver educational resources in a blended learning environment. By initially explaining blended learning as a concept, and then the rationale behind adopting a blended learning approach, we will argue the case for the adoption of a blended learning

approach on an institute-wide basis. We will then discuss the reasons for, and those against, student willingness and motivation to study in a blended classroom and online environment. We will then introduce Moodle and discuss its merits as a platform to provide online content as part of a blended learning environment, and will provide reasons for its integration in a nursing university blended learning curriculum.

2 What is Blended Learning?

Blended learning has proved to be an effective approach to improving the learning environment through incorporation of online teaching resources (Alammary et al., 2014). Despite not only growing interest but also increased necessity in the current climate, there continues to be a lack of clear consensus as to what exactly blended learning entails. Indeed, the increased

necessity has now raised the question of not if to implement blended learning, but rather the question of how to effectively implement it.

Blended learning can mean a variety of things depending on how one defines it. Graham (2012) contends that blended learning shows considerable amount of variation depending upon the institution in which it has been implemented. This has had the result that teachers and administrators have developed different understandings of what blended learning is; consequently, different design approaches have evolved. Horn & Staker (2015) define blended learning as being a formal education program which is delivered at least in part through digital learning, with some flexibility for students to choose the way they want to learn, is delivered at least partly in combination with a physical classroom and teacher and has opportunities for students to learn through activities that capitalize on different learning modalities, building on what Driscoll (2002) outlined as four concepts intrinsic to blended learning:

1. To combine or mix modes of web-based technology (e.g. live virtual classroom, self-paced instruction, collaborative learning, streaming video, audio, and text) to accomplish an educational goal.
2. To combine various pedagogical approaches (e.g. constructivism, behaviorism, cognitivism) to produce an optimal learning outcome with or without instructional technology.
3. To combine any form of instructional technology (e.g. videotape, CD-ROM, web-based training, film) with face-to-face instructor-led training.
4. To mix or combine instructional technology with actual job tasks in order to create a harmonious effect of learning and working.

Although Alammary et al. argue that Driscoll's fourth point is applicable only in the corporate world, students such as those in a

nursing university, engaged in learning practical skills related to actual job tasks, would also fall under this concept of blended learning.

Whilst there are multiple definitions of, and several methods for, incorporating blended learning into a course or program, the best share certain attributes in common. A successful blended learning environment will intentionally make use of technology, whether through making available devices, such as tablets for student use, or through the development of online activities and resources, delivered through the creation or adoption of an LMS. However, key considerations when doing so must be that the chosen technology supports the program or course educational goals, contributes to student learning, increases student contact hours with the material, and is accessible and navigable for students. There also needs to be institute-wide support from those creating and delivering course-content. A further consideration when ensuring a blended approach is effective is the level of student engagement with the content. Student motivation and buy-in are key factors. Students need to be aware that the online or e-learning component to the blended environment is not merely homework activities tagged on to a traditional face-to-face approach, but is rather a part of the whole learning experience. Classroom, or face to face learning, and technology / e-learning should be thoroughly integrated in a blended approach (Fryer, Bovee & Nakao, 2014). Thus, selecting the most appropriate design approach for a blended course is a major challenge.

3 Student Buy-in vs. Student Resistance

One of the major challenges in adopting a blended approach to education is in generating student motivation and student buy-in (as op-

posed to student resistance). Tolman & Kremling (2017, p. 2) define student resistance as “an outcome, a motivational state in which students reject learning opportunities due to systemic factors.” Online learning environments which are difficult or cumbersome to access or navigate, or which only present the material in a uniform format, thereby not taking into account differing student learning styles, can lead to student resistance rather than student buy-in.

Although it is possible to make accessing the LMS compulsory for students, this does not guarantee that the system will be used frequently or efficiently as a means to achieve the students' learning goals. As a result, it is important to consider students as voluntary adopters of the LMS in order to maximize student buy-in. The Technology Adoption Model includes two variables that apply directly to student buy-in: Perceived Usefulness (PU) and Perceived Ease-of-Use (PEOU) (Davis, 1989; Lee, 2006). PU can be increased by having a variety of learning activities available for the student. Rather than just having course notes, or a video of a lecture, students can be provided with dynamic content such as quizzes or online flashcards for individual practice, or by using more communicative tools such as forums, chatrooms, video conferencing, and peer-assessed assignments that offer more collaborative learning opportunities. PEOU can be boosted by having all students use the same universal LMS, and providing support for students who encounter difficulty. With a single institution-wide LMS, students also innately build a community of users and can ask fellow students for assistance if needed. In addition, PEOU can be enhanced by reducing barriers to accessing the system and promoting frictionless access to the LMS, for example; by ensuring student access to compatible devices and internet access, and removing restrictions such

as requiring the installation of a virtual private network (VPN), or restricting access to certain email accounts that force students to log out of personal accounts they might use. Also, having a single institution-wide LMS can reduce the need for students to navigate multiple sites in order to access content on multiple platforms.

An additional factor which could lead to a lack of buy-in from students is in how students evaluate how the online content is being delivered in terms of its aesthetic appeal. Sozen & Delialioğlu (2018, p. 5) found that “students value the power of aesthetics of the LMS in learning and agree that it contributes to learning by increasing motivation, enhancing comprehension, triggering visual memory, and by organizing information in a meaningful manner”.

One further factor which can result in student buy-in is the feeling of immediacy, or the quality or feeling of being directly involved. Zumbrunn et al. (2014) show that a sense of belonging plays a crucial role for students' engagement and achievement. Online learning environments which lack interaction and interactive content run the risk of lacking the immediacy students need in order to buy into the online content, and ultimately the blended learning experience. Indeed, resistance may be exacerbated by the lack of immediacy, caused by feelings of disconnect with the material and lack of interaction with peers and teachers. The amount of social connection and interaction between student and student, and student and teacher in the online component of a blended learning environment can be severely hampered by poor choice of the method of online delivery. Generating student buy-in, as a result of immediacy, can therefore be said to be a key element when choosing an LMS.

4 Benefits of Adopting Moodle

Moodle was first developed and released in 2002, to, according to its founder, “provide educators, administrators and learners with a single robust, secure and integrated system to create personalized learning environments”. As of June 2020, Moodle had 213 million worldwide users, making it the world’s most widely used platform.

The name Moodle itself is an acronym which stands for Modular Object-Oriented Dynamic Learning Environment. Moodle uses FOSS (Free and Open Source Software). This essentially means that users of Moodle do not need to pay any licensing fees, and can adapt or modify the software to suit the needs of their institution once installed since users have access to the source code of Moodle. This makes Moodle a cost-effective, highly flexible, and extremely customizable LMS.

Moodle’s original developer, Martin Dougiamas, adopted social constructivism as the core theory behind Moodle. This means that Moodle was developed from a pedagogical standpoint, and is learning-centered, which, as Cole and Foster (2008) point out, is unlike most other available LMSs which follow a more tool based approach. Many of the available LMSs provide educators with the tools to upload static content, whereas Moodle focuses more on sharing ideas and collaborative construction of knowledge.

Moodle as an LMS is a powerful tool at the disposal of educators and institutions in finding solutions to Tolman & Kremling’s “systemic factors”. Moodle is accessible on any device (smartphone, tablet, PC) from a simple website. Unlike with some options available as an LMS, Moodle does not require the creation or the pre-installation of a virtual private network from a public internet connection. Students are also not required to sign out of existing accounts

on their devices and sign in with a different account in order to access content. Access to the site is through an independent username and password which can be either randomly generated, chosen by students, or allotted by course teachers. Once logged into the site, students can navigate to the course or courses they are enrolled in from their personal dashboard page or from the site home page. Enrolled students can access all the online material made available for their course without having to leave the site or click on links to external sites. Audio tracks, lecture or instructional videos, as well as YouTube videos, as with other forms of media, can be embedded directly into an online course. Students can themselves add video and audio recordings as assignments, all within the site. Moodle’s ability to handle multiple types of learning content, including both static and dynamic-interactive content, ensures the usefulness of the LMS and if used as a single institution-wide LMS, can maximize the ease of use for both faculty and students.

Some of Moodle’s other key features that focus on a collaborative or social constructivist approach include public and private group creation within a course, discussion forums, chatrooms and instant messaging which can all contribute to greater immediacy and interaction, both student to student and student to teacher. The forums can be seen as the foremost tool for enabling asynchronous online discussion within a Moodle site. This asynchrony allows students to spend time researching for, and composing replies to, a discussion thread. It also allows those students who may be reluctant to speak in a classroom the chance to voice their opinions, and to respond to others’ forum posts after having had time to formulate their thoughts.

Moodle’s assignment, quiz, file, folder and glossary (which allows students to create, add to

and maintain a word bank with key words and terms from a course) features allow teachers to deliver content in a variety of ways to preview, review and bolster in-class content. Teachers can restrict access to activities within a course until students have achieved certain 'can-do' or 'must-do' objectives by a pre-set deadline. This allows for a mastery-based grading approach whereby students must first show competency with the key objectives or skills in one unit before accessing subsequent or more-complex content.

As all activity on Moodle can be logged, and the results from interactive activities such as quizzes can be monitored and analyzed, Moodle makes teaching tasks such as recording attendance, course participation, and grading simple and straightforward. As an example, teachers can monitor student activity in the course with reports that are automatically generated by Moodle. The data provided includes detailed logs of when and how often students access the course. Activities and resources can have completion data recorded that is dependent on students viewing or interacting with the content. Moreover, Moodle provides reports on performance data like quiz results that help identify the gaps in knowledge of the students in the course, and using this data a teacher can focus on reviewing the content that students are having the most trouble with (McNabb & Jenkins, 2010). All of this data can be collated into reports on student participation or counted towards attendance. This data can be automatically generated in LMS environments, such as Moodle, and would facilitate early detection of at-risk students, as well as generating behavioral analyses of both the individual student as well as any collaborative groups of students within a course, which ultimately could foreseeably increase the teaching quality and learning out-

comes.

Moodle also has a sophisticated gradebook function that can enable students to track their progress through a course as well as automate much if not all of the tasks associated with collecting and weighting grades producing a total course grade. Different activities can be grouped into categories with weights or grade aggregation styles specified at the grade item or category levels. Activities may be added that allow for additional credit. Activities that feature automatic marking can also push grades to the gradebook automatically, and letter grade thresholds can be set that provide teachers a final calculated gradebook at the end of semester. For students, as each task in the course is completed, they can (if enabled by their teacher) view their results from activities done thus far providing extensive feedback on a per student basis. Furthermore, activities that use automated marking, can be given with greater frequency to provide more instructional, formative assessments that would otherwise not be practical to provide.

While Moodle does boast excellent features, it is not, as indeed all LMSs are not, a ready-to-go solution to adopting a blended learning approach. The decision to adopt a blended learning approach requires a commitment from the educators and course-content creators. It is important to remember that an LMS must be customized to fit the institution, and in order to do this, Moodle requires administrators who are competent at navigating through the Moodle site in order to keep it running smoothly. Arguably the biggest challenge to adopting Moodle is that the site administrators will need to have certain technical skills which go beyond the skill set of being able to use Microsoft Office proficiently. However, if the institute makes the commitment to provide a fully functioning blended learning environment, it is the conclusion

of the authors that Moodle is the best cost-effective, customizable, robust solution to the problem of selecting an LMS.

5 Applications in a Nursing Context

Moodle has great potential for creating a blended learning environment in a nursing context. To meet the requirements of nursing care, nursing education requires students to develop clinical nursing judgment and be able to apply learned skills to address the health issues of those in need of nursing care (Jang & Hong, 2016). Due in part to gaps or weakness in more traditional education methods, such as those which teach by rote, with a focus on memorization of material or theory as presented in lectures, which may lack connectivity to practical application, simulation plays a pivotal role in preparing student nurses for actual experiences in hospitals, as they are carried out in artificial settings thereby allowing the student to be able to practice safely. However, as Sanford (2011) states, one drawback to simulation in nursing education is that the nature of creating scenarios is extremely time-consuming, since it requires both creating realistic scenarios to practice safely, as well as setting up a simulation room or area, and as such can be a burden on already time-constrained instructors. A robust LMS such as Moodle could be key to scaffolding a successful simulated scenario through its discussion forums and groups, where students could carry out pre-briefing activities. Moodle is also fully compatible with HTML5 Package content (H5P). H5P, like Moodle, is free and open-source, and the use of H5P content gives instructors a wide range of options for creating interactive video and interactive presentations which could be used to introduce the scenario to be simulated, and would allow students to see professionals carrying out the scenario in prepa-

ration for their own experience in a simulation center. Furthermore, the H5P content would allow instructors to record and upload videos taken during student simulations to the Moodle course, and then pose self-reflection activities in a Moodle group as post-simulation review, or as an assessed component of the simulation. Moodle's quiz function would allow instructors to assess the students' competency with the content, and discussion forums provide a location for feedback and group commentary.

6 Conclusion

Blended learning already looks set to play a key role in tertiary education as more and more colleges and universities move towards creating on-demand content to support the traditional face-to-face learning of the conventional classroom. This trend has been especially pronounced, and indeed accelerated in 2020 as the novel Coronavirus Covid-19 has forced tertiary institutions to close their doors to students and move as much content online as possible. The adoption of a robust LMS is now more important than ever before. Moodle as an LMS provides institutions with a robust yet flexible, free fully-customizable platform upon which to build a wholly-integrated blended learning environment. In a nursing university context, Moodle allows students to work collaboratively through its discussion forums and chatroom, allows them to prepare ahead of time through its interactive activities and H5P content for more practical hands-on activities in the classroom or during simulations, and allows students to stay in contact with peers and with teachers throughout the learning experience in a safe, secure environment.

7 References

- Alammary, A., Sheard, J., & Carbone, A. (2014) Blended learning in higher education: Three different design approaches. *Australasian Journal of Educational Technology*, 30(4).
- Cavanagh, A. J., Aragón, Oriana R., Chen, X., Couch, B., Durham, M.F., Hanauer, D. I., Graham, M.J. (2017) Student Buy-In to Active Learning in a College Science Course. *Cbe Life Sciences Education*. 15(4). 15:ar76, 1-9.
- Cole, J. & Foster, H. (2008) *Using Moodle: Teaching with the Popular Open Source Course Management System* O'Reilly Community Press.
- Davis, F. D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319.
<https://doi.org/10.2307/249008>
- Fryer, L., Bovee, H., Nakao, K. (2014) E-learning: Reasons students in language learning courses don't want to. *Kyushu Sangyo University Language Education and Research Center Journal*, 7, 5-21.
- Horn, M., Staker, H. (2015) *Blended: Using Disruptive Innovation to Improve Schools* Jossey-Bass.
- Jang Hee-Jung & Hong Sun-Yeu (2016) The Effects of Blended Learning in Nursing Education on Critical Thinking and Learning Satisfaction of Nursing Students, Conference Paper, *Advanced Science and Technology Letters*.
- Jenkins, A. (2015) Benefits of Institutional Integration of Moodle MoodleMoot Japan Proceedings.
- Lee, Y. (2006) An empirical investigation into factors influencing the adoption of an. e-learning system. *Online Information Review*, 30(5), 517-541.
<https://doi.org/10.1108/14684520610706406>
- McNabb, R. G., Jenkins, A. (2010) Managing and measuring your students' coursework by utilizing Moodle. In X. Yu (Ed.), *Proceedings of the 2010 Academic Forum between Jiliang University and Shizuoka Institute of Science and Technology* (pp. 15-17). Jiliang University Press.
- Sanford, P.G. (2010) *Simulation in Nursing Education: A Review of the Research*. The Qualitative Report Volume 15 Number 1006-1011.
- Sozen, N., Delialioğlu, Ö. (2018) Aesthetics of Web and Mobile Interfaces of a Learning Management System: A Comparative Analysis (Conference Paper) 26th International Conference on Computers in Education.
- Tolman, A. O. Kremlin, J. (Eds) (2017) *Why Students resist learning: A practical model for understanding and helping students*. Sterling, Virginia: Stylus Publishing, LLC.
- Zumbrunn, S. McKim, C., Buhs, E., Hawley, L. R. (2014) Support, belonging, motivation, and engagement in the college classroom: A mixed method study. *Instructional Science*. 42(5). 661-684.