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Original Paper

Blackboard vs Moodle: A Comparison of Student Experience of Learning Management Systems at the Open University of Mauritius

U. Bhunjun Gokhool, A.C. Gokhool, V. Gooria & R. Gunesh

Open University of Mauritius, Reduit, Mauritius

Abstract

Transitioning from one Learning Management System (LMS) to another is a challenging process. Learning must be accessible everywhere to learners and, therefore, rely utterly on a user-friendly LMS. The Open University of Mauritius started the transition process from Moodle to Blackboard in 2022. Blackboard provides learners and teachers with an inclusive learning environment. Both asynchronous and synchronous methods are incorporated in Blackboard to facilitate learning. Several mechanisms were put in place to support learners transitioning to the new LMS. The objectives of this study were to assess the effectiveness of Blackboard as an aid to the learning process of learners, to investigate the learners' perceived satisfaction between Blackboard and Moodle and finally, to assess students' learning experiences with the new LMS. A questionnaire was administered to learners of Year 2. The sample was representative as students used both platforms during the two semesters. Analysis showed that around 75% of students preferred Blackboard and were satisfied with this LMS. Gap analysis revealed that both platforms were better with respect to online teaching and learning, while multiple regression analysis indicated that ease of use and course and curriculum design had significant positive impacts on the level of satisfaction of students with Blackboard.

Keywords: Blackboard, Moodle, Learner Management System, Student, Open University of Mauritius

Introduction

There are approximately 200 Learner Management Systems (LMSs) and 73.8 million LMS users including educational institutions, government agencies, private consumers and business worldwide (Configio, 2023). They used the LMS to improve the learning environment and performance. In this study, only two Learner Management Systems, namely Blackboard and Moodle were compared. Digital transformation in higher education institutions is not a unique development, but has been used for a few years now (Kopp et al., 2019). Information Technology, which has become a vital part of our everyday life, is needed in every field, and the Education sector is no exception. The use of ICT for educational purposes has increased in such a way that modern technologies have changed the way teaching and learning takes place. With the Internet and advancement in digital communications, teachers and students can connect in a new way. Education technology has a significant impact on learning among university students, as the latter use it throughout their course. In an educational setting, e-learning platforms are also known as Learning Management Systems, a concept that arose directly from e-learning. E-learning, also known as "online" or "Electronic" Learning is learning that is facilitated and supported by internet technologies. Since 2020, E-learning has been broadly implemented in higher education institutions using Learning Management Systems (Heo & Han, 2021).

The Open University of Mauritius (OUM) has been using the Moodle platform as the main Learning Management System since its set-up in 2013. In 2022, in order to meet the requirements of the growing number of students and provide quality education to everyone, OUM adopted a new LMS, Blackboard, which is more robust and effective. The migration process was done in a progressive manner that is for Year 1 and Year 2 students. The focus of this study is to investigate the usability and learners' perceived satisfaction between Blackboard and Moodle. It also determines the effectiveness of the new LMS in their learning process.

Role of Learning Management Systems in educational environments

An LMS is a comprehensive educational platform where instructors upload their course materials and run their courses and students conveniently access them through their user profiles. The Learning Management System (LMS) has become an integral part of higher education, as it blends in-class and online activities (Pishva *et al*., 2010). Today, the Education sector makes use of Learning Management Systems to ease distance education (Wael and Morsi, 2005). Higher education institutions are prominently adopting online learning methods to facilitate learning. Learning management systems offer a streamlined, organised and efficient e-learning platform for the convenience of students and instructors. LMS allows instructors to share learning materials, organise contents, lessons and communicate virtually with students to facilitate the teaching and learning process. LMS provides a systematic way for universities to manage and deliver courses (Godwin-Jones, 2012).

Due to the Covid19 pandemic, LMS platforms have gained much more popularity. There has been an increased move towards the adoption of online platforms in higher education institutions across the world. The global LMS market size was reported to be around USD 16.19 billion in 2022 and is expected to reach USD 18.26 billion in 2023 (Fortune Business Insights, 2023). The success and popularity of Learning Management Systems in higher education institutions can be attributed to the amount of accessibility, flexibility and convenience it brings to all its users. Additionally, LMS increasingly incorporates cutting-edge technologies such as Virtual Reality (VR) and Artificial Intelligence (AI) while creating immersive educational environments and enabling students to personalize learning experiences (Gami, P. 2023). The future of LMS in education looks exciting with VR, AI and also mobile learning but addressing regulatory considerations to ensure a reliable, safe and compliant educational environment has become a concern.

Usage of Blackboard Learning platform system

Blackboard is a learning management system (LMS) developed and maintained by Blackboard Inc. It was founded in 1997 by Matthew Pittinsky and Michael Chasen to provide an innovative approach to online learning. Blackboard is an entirely web-based learning platform designed to allow instructors and students to interact during online classes. It is not only used for sharing of course materials and information, but is also used as a communication tool between instructors and learners through emails, discussion forum, messages, announcement, podcast and so on. Blackboard has been developed in an effective way that suits the learning model with respect to learner cognitive engagement and constructivist perspective. Blackboard is operated by more than 70% of the US colleges and universities (Bradford *et al*., 2007). However, users of Blackboard must be able to master this education technology in order to facilitate learning. Otherwise, it will be viewed as one step ahead of the technology and two steps back for the pedagogy (Minduser *et al*., 1999). According to (Prescott, 2013), Blackboard is perceived as inflexible and difficult to use by learners as there is the fear of loss of control on instruction that may undermine pedagogy and strong focus on ‘static’ tools such as SafeAssign, surveys, quizzes and tests.

Usage of Moodle Learning platform system

Modular object-oriented dynamic learning environment (Moodle) is an LMS that is increasingly used to facilitate e-learning (Dogoriti *et al*., 2014; Lisnani and Putri, 2020). As stated by Aljawarneh *et al*. (2010), Moodle is easy to install and use in many tertiary institutions. It is an open-source, meaning that it can be customized to the local needs and is free of any license cost. The main tools available on any standard Moodle platform are Assignments, Chats, Forums, News and Quiz/Survey, but it also incorporates some external tools like Blogs, Wikis, Questionnaires and Web-conference that are prominent for facilitating the pedagogy requirements needed in collaborative and blended learning. This e-learn platform offers comprehensive synchronous and asynchronous services’ (Filippidi *et al*., 2010) and is cultured toward collaborative learning. Moodle is characterised as a tool from a constructivist perspective that affirms research and collaboration through its structure and available features developed for training (Martins and Giraffa, 2008). Zainuddin *et al*. (2016) declared that lecturers found that Moodle had helped them have a feeling of connectedness with their Open and Distance Learning students. Paiva (2010) observed that many applications and features were developed on e-learning platforms that contribute to the growth of shared knowledge and communication between

learners. However, Zainuddin *et al*. (2016) revealed greater scope for Moodle to influence distance teaching and learning and curriculum design at a deep level and therefore shifting the perception of seeing Moodle as a 'pump and dump repository' towards embracing the frontier of innovation in teaching and learning.

General Comparison between Moodle and Blackboard Learning Management Systems

Table 1. General comparison between Moodle and Blackboard

	Moodle	Blackboard
Social Presence	A good mediator to reduce isolation and encourage participation in online courses Certain degree of 'idle chit-chat' although it is challenging for Moodle to develop a microblogging plugin.	Creating intuitive behaviour with e-collaborative learning tools and learning becomes social and participatory; Synergizing learner between task and technology; Promoting constructivist and interactive online learning environments; Creating an affective domain with self-regulated learning and causing positive learning behaviour; Personalizing learner-focused contents and activities; and Allowing collaborative content creation and fostering a community of learners
Cognitive Presence	Building mutual understanding, trust and maximising cognitive presence through several features from Moodle; Not adapting to microblogging. This may contribute to more iterative and co-constructing knowledge	Cognitively engage learner, causing them to think about the course materials and coming up with meaning, relevance, application and contexts; Enabling higher-order cognition and learning; Converting tacit knowledge to an explicit or codified knowledge that eliminates the factors of loss of knowledge due to memory limitations; and Reducing costs of knowledge reproduction
Teaching Presence	Dependency of teacher presence to promote productive discussions; Writing of mathematical equations is possible on Moodle; Web-based classes	Problems associated with the writing of mathematical equations in Blackboard; Beyond delivery of mechanical information (digital Myopia) but focus more on innovative pedagogic approach to learning Flexibility
General	Open source; Provision of different formats: weekly, topics or social; Moodle has an optional fully-branded mobile app.	Subscribed license, more expensive; Blackboard has a competitive edge over Moodle; Blackboard has a compartmentalized presentation that is standard and cannot be changed; and Blackboard has robust reporting features readily available to students

LMS as a Facilitator for Collaborative learning, Peer interaction, and Knowledge Construction

In the wake of technology integration in the teaching and learning process and the trend to embrace online learning, self-directed learning skills are significantly used (Gooria, V, Appavoo, P. Bhunjun, U & Gokhool, A, 2021) and this has become a reality with LMS. Studies are focusing towards collaborative content creation and fostering a community of learners and the availability and development of an effective domain in a university with a dimension of self-regulated and collaborative learning are more impactful to cause positive learning behaviour. Interaction and collaboration among students are crucial factors of the learning process (Palloff and Pratt, 1999; 2007). Collaborative learning is an educational approach, whereby students participate in groups to analyse and solve complex problems, complete tasks and or learn new concepts. LMS provides tools such as discussion forums, messages and chat rooms to support interaction and active online engagement between students and instructors (West *et al*., 2007). This collaborative learning style helps students to develop critical thinking, problem solving abilities and work collaboratively in a range of complex situations. In a successful collaborative learning environment, students experience positive interdependence with active interaction among group members. A study carried out in 2019 at the Open University (Appavoo, P., Sukon, K.S., Gokhool, A.C., Gooria, V. (2019) revealed that at least one third of the students were not participating in Collaborative Learning and were thus missing the benefits of 'learning together' while using Moodle but this situation has changed with Blackboard. Students access the online collaborative learning platform from different places, they are able to learn jointly. Active collaborative learning has a positive impact on student performance when it is integrated with the use of technology (Loes and Pascarella, 2017).

Peer learning is another widely used collaborative learning approach in higher education. Peer learning is an approach to learning where students interact with their peers to learn from each other (Boud *et al*., 2001). This collaborative learning strategy involves working in pairs or small groups to explore, discuss and solve complex issues. LMS offers a platform by integrating tools for collaborative learning to help and support students by synchronizing face to face learning with peer learning. Students learn a lot from their peers when they share their ideas and participate in activities. Peer learning helps to develop communication skills, teamwork and there is a good collaboration among students. Students are also able to receive constructive feedback and evaluate their own learning. Higher education institutions are constantly emphasising a lot on promoting employability skills and peer learning is a medium through which students are able to develop transferable skills (Topping, 2005; Johnston, 2009).

Synchronous v/s Asynchronous learning

Online teaching and learning have become important points of focus in the Education sector, especially in higher education institutions. The Covid19 pandemic accelerated the shift to online education to meet students' needs. This gave rise to the use of both synchronous and asynchronous teaching and learning approaches. Usually, both synchronous and asynchronous teaching and learning are done through a learning management system (Jackson, 2012). Synchronous learning is any learning that happens in real time. Students and instructors meet at the same time and place (virtual or physical) to engage in learning simultaneously. Synchronous learning operates much like traditional classrooms, and is said to positively impact learners' commitment and motivation level (Hrastinski, 2008). On the other hand, asynchronous learning allows students to learn according to their own schedule. It gives students the flexibility to engage with the course contents and complete courses without any constraints to be present at a particular time. In asynchronous learning, instructors support students through emails, chats, discussion forums, podcasts and recorded sessions.

Theoretical Focus: Community of Inquiry (COI) model

This research is grounded on the Community of Inquiry (COI) model developed by (Garrison *et al*., 2000). It is one of the widely used theoretical frameworks for building an effective online and blended learning environment where students feel connected and engaged with other students as well as their instructors. This model highlights social presence, cognitive presence and teaching presence as the core elements for a successful blended learning experience in higher education (Garrison *et al*., 2000).

Social Presence

Social presence highlights the ability of participants to project themselves as 'real participants' online through a medium of communication (Lowenthal ,2010). Participants need to connect, communicate and build interpersonal personalities with the community (Garrison, Anderson & Archer, 1999). Garrison *et al*. (2000) pointed out three important categories of social indicators important to create interactions which are: (1) Emotional expression: where students share personal emotions and expressions; (2) Open communication: where students express themselves freely by asking questions, interact through messages and express agreements; (3) Group cohesion: where students are connected to the group and help each other in achieving its goals (Garrison *et al*., 2000). Blackboard Learning Management System helps instructors to build an online community by prompting discussions. This encourages students to share their experiences and ideas and participate in discussions. At the same time, they build a personal connection with each other. The connection between social presence and perceived learning was found to have a positive impact on students with high social presence than those who perceived low social presence (Richardson and Swan, 2003).

Cognitive presence

Cognitive presence emphasises on the ability of the students to cognitively engage with the community by constructing meaning and knowledge through reflection and discussion (Garrison *et al*., 1999). The Practical Inquiry Model (PIM) created by Garrison *et al*. (2000) highlights four phases to cognitively engage students. They are (1) Triggering event: where students are introduced to a problem or issue for further review; (2) Exploration: where students explore the situation or problem; (3) Meaning construction: where students assign meaning to the given problem; (4) Application of Knowledge: where students apply the knowledge and skills that they have learned to real world situations (Garrison *et al*., 2000). Blackboard Learning Management System allows instructors to create a variety of activities and assignments including video, audio, brainstorming, team-based working, breakout rooms, peer review, formative assessment amongst others to demonstrate learning. Students are able to dive into deep learning as these activities prompt reflection and encourage reflection.

Teaching presence

Teaching presence is important in developing a community of inquiry. It holds the social and cognitive presence together by ensuring a supportive and developmental role. Teaching presence consists of three components namely Instructional design, Facilitating discussions and Direct instructions (Anderson *et al*., 2001). The first component consists of developing the curriculum, design of course and a timeline. It is important to design a curriculum that provides a productive learning environment and takes into consideration the social as well as the cognitive presence. The second part is the facilitation of discussion and learning activities in the learning process. It is key to ensure that there are meaningful and collaborative discussions between the instructor and students. In an online setting, the discussion forum and message option are effective communication tools to engage students in meaningful activities. The third component is direct instructions where the instructor assists the students with questions, understanding and summarising the discussion (Garrison *et al*., 1999). Direct instructions are important in an online educational context as if done in a collaborative manner, it eliminates frustration and opens up facilitation which at the end helps build a community of inquiry. Blackboard Learning Management System helps instructors to build a teaching presence by helping them personalised their class platform and regularly keep in touch with their students. Providing constructive feedback on time helps students complete their task easily. Moreover, students can reach out to their instructors anytime (synchronously or asynchronously) if they require any support. Evidence demonstrates the growing importance of teaching presence "as a significant determinant of student satisfaction, perceived learning, and sense of community" (Garrison and Arbaugh, 2007, p. 163).

Methodology

A quantitative approach was adopted for this research and an online survey was conducted among learners at the Open University of Mauritius. The online survey consisting of 20 items and 10 sections was set up on Google Forms and questions were formulated based on key elements from the literature review and objectives of the study. A pilot test was conducted among 10 learners and their feedback

was considered while finalizing the questionnaire. The convenience sampling method was more appropriate for this survey since the researchers concentrated on participants with particular characteristics, which for this survey, are students who have used both Moodle and Blackboard (Etikan *et al*., 2016). Therefore, the questionnaire was administered by email to undergraduate learners of Year 2 semester 1 and postgraduate learners of Year 2 semester 2 to obtain data on the objectives set. Moreover, ethical considerations such as voluntary participation, consent and confidentiality were respected. The survey was conducted over a period of 2 months and 221 responses were obtained out of which 77.4% were enrolled on an undergraduate programme, while 22.6% were from a postgraduate programme. Prior to data analysis, survey data was tested for constructs validity and reliability, even though a sample size of 221 may be considered as statistically large. Construct validity testing was conducted to verify whether "research constructs were unidimensional" (Ahmad and Sabri, 2013, p.4), while the aim of reliability was to test the measuring instrument for internal consistency (Wiener *et al*., 2017). It was observed that the *p*-values obtained for Bartlett's test were all less than 5% and hence significant (Field, 2016), meaning that the constructs represented by the eight sets of statements were unidimensional. Furthermore, the sample was adequate, given that each KMO statistic was at least 0.5 (Field, 2016). Both the lower and upper acceptable limits for internal consistency were respected for each set of statements, so that the internal consistency of the questionnaire was confirmed.

Results and Discussion

73% of sampled students asserted that they preferred using Blackboard. Among the reasons for their choice featured easy access to a wide range of information, easy access to recordings of sessions and easy communication with tutors. Moreover, students also indicated that they can easily submit the assignment using the drop box and easily view the assignment grade for each module. Additionally, tutors provide individual constructive feedback on assignments.

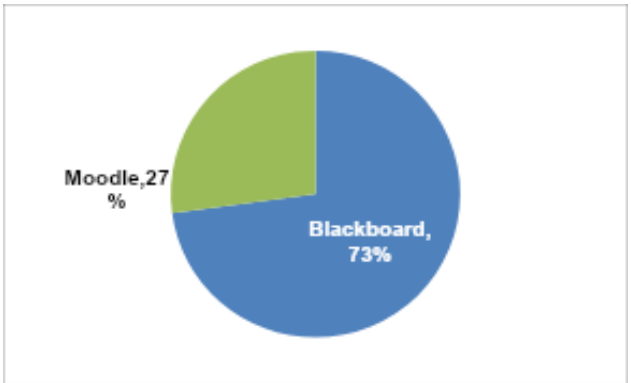

Figure 1. Preferred platform

Satisfaction and Challenges faced while using Blackboard

Table 2. Issues encountered while using Blackboard

	Percent of Cases
Difficult to access on smartphone	44.8%
Not easy to navigate	34.5%
Difficult to upload assignment	26.8%
Difficult to download learning materials	23.7%
Other	18.0%

With regards to the issues encountered by students while using Blackboard, 44.8% said that they had difficulties accessing the platform on smartphones, whereas 34.5% of them found it difficult to navigate. Difficulties uploading assignments (26.8%) and downloading learning materials (23.7%) were met with by around a quarter of students, while 18.0% of them mentioned that other issues included connectivity problems while doing online classes, sound problems and that not all features on blackboard are utilised by the tutors.

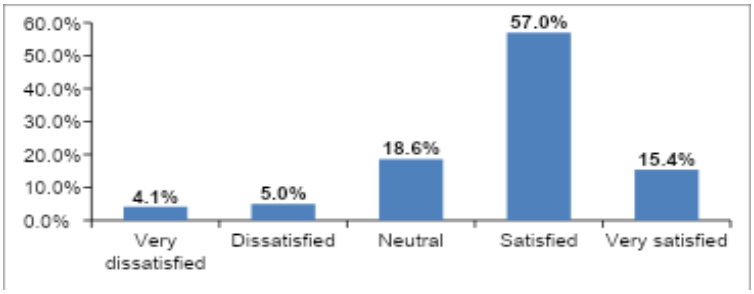

Figure 2. Level of satisfaction with the use of Blackboard

The negatively skewed distribution of responses in **Figure 2** shows that most students (72.4%) were either satisfied or very satisfied with using the Blackboard platform. While 18.6% of them reserved their opinions, 5.0% and 4.1% were respectively dissatisfied and very dissatisfied.

Gap Analysis between Blackboard and Moodle

The comparative analysis of students' learning experience via Moodle and Blackboard was conducted by way of a gap analysis. Based on the same principle as that of the IPA (Importance-Performance Analysis) by Tileng *et al*. (2013), the gaps between the mean scores of the corresponding Likert-type statements measuring the four constructs (dimensions), *Ease of Use*, *Communication*, *Student Engagement* and *Course and Curriculum Design*, under Moodle and Blackboard in the survey instrument were calculated. It is worth mentioning that, for the purpose of matching, statements below *Ease of Use* were reordered, with one extra statement being removed under each of *Ease of Use* and *Student Engagement* in the Blackboard section in the administered questionnaire. Gap analysis was then carried out with 25 items.

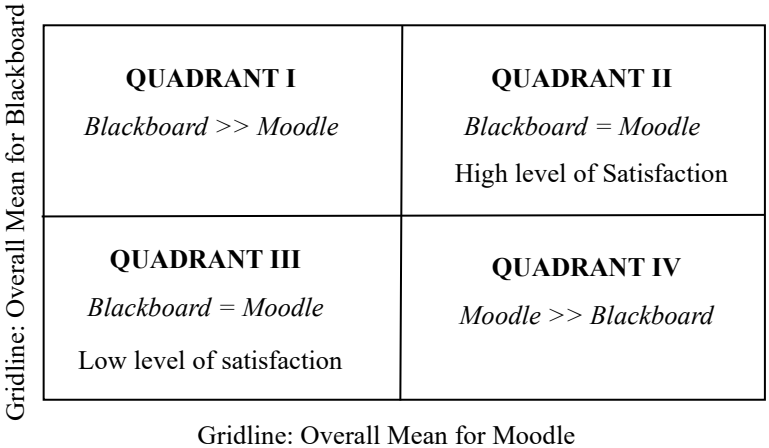

Figure 3. Moodle-Blackboard Analysis Grid

Source: Adapted from Tileng *et al*. (2013, p.24)

Figure 3 shows the Moodle-Blackboard Grid that was used to identify the gaps between the perceived effectiveness of the two Learning Management Systems (LMSs) or platforms. The differences between students' mean ratings of the 25 items (Moodle minus Blackboard) were calculated before plotting them on a scatter diagram as points with coordinates (*mean Moodle*, *mean Blackboard*). It is to be noted that means for Moodle were used as references (*x*-values) since it was the currently-existing LMS before the advent of Blackboard. Thereafter, the lines of overall mean for Moodle and Blackboard were drawn to divide the points into four quadrants.

Table 3 below shows the mean Moodle and Blackboard (BB) scores, as well as the mean gap for each statement under the four dimensions.

Table 3. Moodle-Blackboard Gaps

Dimensions/Statements		**Mean Moodle**	**Mean BB**	**Gap**
1. Ease of Use				
EOU 1	User-friendliness	3.84	3.78	0.06
EOU 2	Attractive layout	3.35	3.87	-0.52
EOU 3	Ease of finding planner and other information	3.60	3.65	-0.05
EOU 4	Ease of access to tutorials of induction	3.73	3.71	0.03
EOU 5	Ease of submission of assignment	3.57	3.66	-0.08
EOU 6	Ease of viewing assignment mark without any difficulties	3.46	3.62	-0.16
EOU 7	Ease of finding important information on exams	3.58	3.52	0.06
EOU 8	Ease of access to the e-library for further research	3.42	3.15	0.27
2. Communication				
COM 1	Tutor's use of announcement tool to notify about important information	3.69	3.92	-0.23
COM 2	Use of message feature to interact with tutor	3.45	3.80	-0.35
COM 3	Use of discussion forum to interact with classmates	3.29	3.62	-0.33
COM 4	Tutor's responsiveness to queries	3.32	3.55	-0.23
COM 5	Ease of joining sessions	3.88	3.89	-0.01
3. Student Engagement				
ENG 1	Tutor's encouragement to interact during online session	3.76	3.85	-0.09
ENG 2	Tutor's creation of activities to engage students in collaborative learning	3.14	3.48	-0.34
ENG 3	Tutor's ability to establish a positive teacher presence during online session	3.54	3.73	-0.19
ENG 4	Tutor's responsiveness to discussion forums	3.48	3.62	-0.14
ENG 5	Tutor providing constructive feedback on assignment for further improvement	3.37	3.56	-0.19
ENG 6	Tutor posting additional reading materials to support learning	3.71	3.78	-0.07

4. Course and Curriculum Design				
CCD 1	Platform is well-structured in terms of contents	3.62	3.74	-0.12
CCD 2	Ability to access modules without any issues	3.86	3.86	0.00
CCD 3	Ease of access to notes	3.86	3.87	-0.02
CCD 4	Ease of viewing recorded sessions	3.41	3.80	-0.38
CCD 5	Assignment grades easily available	3.51	3.68	-0.17
CCD 6	Learning goals and objectives clearly stated by tutor	3.76	3.67	0.09
Overall means/gap		**3.57**	**3.70**	**-0.13**

Figure 4 is a pictorial display of the Moodle-Blackboard Grid. The interpretation of results was carried out, based on the location of points in the four quadrants, as defined in **Figure 3** above.

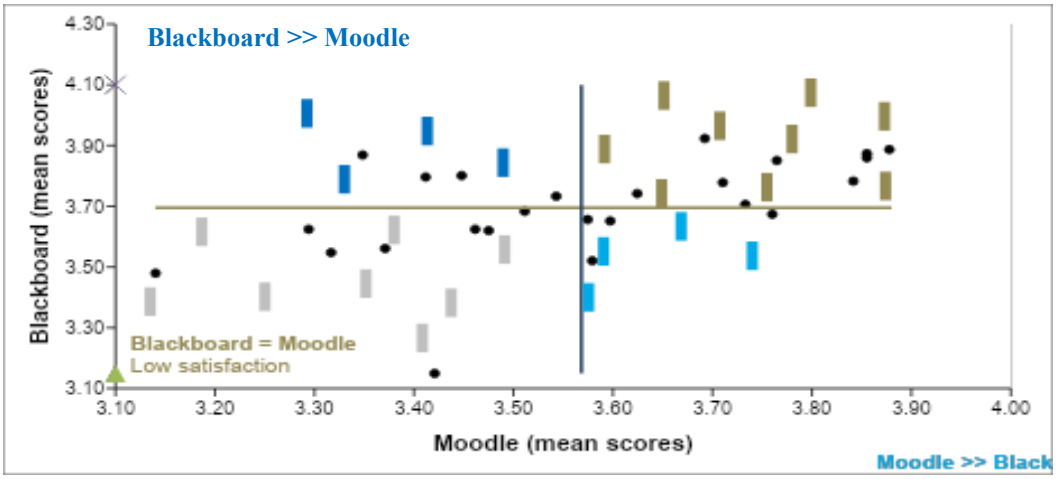

Figure 4. Moodle-Blackboard Gap Analysis

Quadrant I

The first quadrant of **Figure 4** consists of points with Blackboard means being significantly higher than those of Moodle. According to students, as compared to Moodle, Blackboard not only has a more attractive layout (*G* = -0.52), but offers several advantages, namely that it allows for the use of message feature to interact with tutor (*G* = -0.35) and facilitates the viewing of recorded sessions (*G* = -0.38). Moreover, students observed that tutors can better establish a positive teacher presence during online sessions (*G* = -0.19).

Quadrant II

This quadrant encompasses the aspects that were effectively dealt with by both Moodle and Blackboard students, and with which students were highly satisfied. According to them, both platforms were user-friendly (*G* = 0.06) and it was easy to access tutorials of induction on both of them (*G* = 0.03). Both platforms were judged to be equally very effective in terms of communication, namely with regards to the use of announcement tools to notify about important information (G = -0.23) and the ease of joining online sessions (G = -0.01). Students also very much agreed that there was little to separate Moodle from Blackboard concerning tutors' encouragement to interact during online sessions (G = -0.09) and posting of additional reading materials to support learning (G = -0.07). Lastly, students were equally very satisfied with the way that both platforms were structured in terms of content (G = -0.12),

and facilitated access to modules (G = 0.00) and notes (G = -0.02) without any issues.

Quadrant III

Quadrant III consisted of the features of each platform that were equally lowly rated by students, starting with the ease of view assignment marks (G = -0.16) and access to assignment grades (G = -0.17) and to the e-library for further research (G = 0.27). For both platforms, tutors, in particular, received low ratings for their lack of responsiveness to queries (G = -0.23) and discussion forums (G = -0.14), lack of creativity concerning activities to engage students in collaborative learning (G = -0.34) and scarcely providing constructive feedback on assignment for further improvement (G = -0.19). Students also pointed out the underuse of discussion forums to interact with classmates (G = -0.33).

Quadrant IV

The last quadrant contained only four points, whereby Moodle was judged to be more effective than Blackboard, from a student perspective. Most aspects were related to *Ease of Use*, as pointed out by students concerning the ease of finding the planner and other information (G = -0.05), submission of assignments (G = -0.08) and finding important information on exams (G = 0.06). Students also asserted that tutors provided them with learning goals and objectives more clearly on Moodle (G = 0.09).

Usability and Perceived Student's Level of Satisfaction

Correlation analysis was carried out as a preliminary step leading to multiple regression analysis (O'Brien and Scott, 2012). The values of the four constructs presumably affecting student's level of satisfaction with using Blackboard, namely *Ease of Use* (*EOU*), *Communication* (*COM*), *Student Engagement* (*ENG*) and *Course and Curriculum Design* (*CCD*), were calculated as an overall average of the mean scores of the statements measuring them. The dependent variable *Level of Satisfaction* (*SAT*) was measured on a five-point Likert scale. Given that all scales were at least ordinal, Pearson's product-moment correlation was used to determine the coefficients, as shown in **Table 4**.

Table 4. Correlation matrix of constructs

Constructs	*EOU*	*COM*	*ENG*	*CCD*
EOU	1			
COM	.708**	1		
ENG	.714**	.745**	1	
CCD	.831**	.724**	.749**	1
SAT	.749**	.569**	.588**	.753**

** $p < 0.01$

The correlation coefficients between the four independent variables and the dependent variable were all flagged by SPSS as being significant at the 1% level. Nonetheless, since correlation does not imply causality (Singh, 2018), multiple regression analysis was conducted to identify the significant predictors of *Level of Satisfaction*.

Multiple Regression Analysis

Prior to conducting multiple regression analysis, all data assumptions were checked. First of all, the dependent variable *SAT* was reasonably assumed to be interval. Two outliers were identified and removed, as their respective standardized residuals were outside ±3.29 (Dart, 2017). The VIFs of the independent variables were all less than 10 (Hair *et al*., 2013), indicating the absence of multicollinearity. Standardized residuals were independent, with a Durbin-Watson statistic of 2.076 (Garson, 2014), and approximately normally distributed ($M = 6.4 \times 10^{-16}$, SD = 0.991). The scatterplot of standardized residuals also showed that homoscedasticity and linearity conditions were satisfied,

while each independent variable had a non-zero variance (0.535, 0.570, 0.666 and 0.803 for *EOU*, *COM*, *ENG* and *CCD* respectively). **Table 5** shows the output for multiple regression analysis.

Table 5. Output of multiple regression analysis

Dependent variable		*SAT*			
Method		Least Squares			
Sample		221			
Included observations		219			
	Unstandardized coefficients		*Standardized coefficients*		
Variable	*B*	*Std. Error*	*Beta*	*t-statistic*	*p-value*
(Constant)	.493	.208		2.375	.018
EOU	.513	.099	.416	5.192	.000**
COM	-.044	.083	-.037	-.527	.598
ENG	-.018	.080	-.016	-.221	.825
CCD	.450	.085	.446	5.277	.000**
R-squared		.617			
Adjusted R-squared		.610			
Durbin-Watson statistic		2.076			
F-statistic		86.266			
Sig.		.000**			

** $p < 0.01$

The multiple regression was significant at the 1% level ($F = 86.266$, $p < .001$), with the independent variables explaining 61.7% of the variability in *SAT*. Thus, besides the model fitting the sample data quite well, this result is of considerable practical significance. Moreover, *Ease of Use* ($\beta = .416$, $t = 5.192$, $p < .001$) and *Course and Curriculum Design* ($\beta = .446$, $t = 5.277$, $p < .001$) had significant positive impacts on *Level of Satisfaction* at the 1% level. *Course and Curriculum Design* had a higher impact on the dependent variable with a β-coefficient of 0.446. Both *Communication* ($\beta = -.037$) and *Student Engagement* ($\beta = -.016$) had negative regression coefficients and were non-significant.

Conclusion and Future research

In this study, both the blackboard and Moodle platforms were judged to be equally very effective in terms of communication, namely with regards to the use of announcement tools to notify about important information. The findings revealed that compared to Moodle, Blackboard not only has a more attractive layout but offers several advantages, such as allowing for the use of message features to interact with tutors and facilitating the viewing of recorded sessions. Moreover, it was observed that tutors can better establish a positive teacher presence during online sessions. Furthermore, it was found that there was a small difference between Moodle and Blackboard concerning tutors' encouragement to interact during online sessions and posting of additional reading materials to support learning. The underuse of discussion forums to interact with classmates was also observed. Overall, students have demonstrated that they preferred using Blackboard more than Moodle. In conclusion, it appears that Blackboard is a convenient LMS that stimulates pedagogical gain and constructivist perspectives.

In terms of future research, a further study could be conducted across all levels of undergraduate and postgraduate programmes at the Open University of Mauritius to analyse in-depth the effectiveness of the use of blackboard towards its contribution to the learning process. In addition, a larger sample size would have to be considered.

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