

Adaptation and usability of learning management system to the new normal dental education

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Abstract

Dental schools are in constant quest to develop an efficient and innovative learning and teaching platform to enhance the students' learning experiences, while supporting the faculty's capacity for quality instruction. This research determined the overall quality of use of the Learning Management System (LMS) by a private dental school. More specifically, it aimed to: 1) present the profile of respondents according to sex, student's year level or faculty's length of stay in the university, types of internet connectivity, and types of devices; 2) determine the level of overall faculty's satisfaction on LMS' navigation and usability; 3) determine the level of overall students' satisfaction on LMS content of e-learning course, navigation, usability and e-learning assistance; 4) test the significant difference on the level of overall satisfaction as perceived by the student and faculty when grouped according to profile; and 5) propose an action plan to enhance the use of LMS to the dental curriculum. Using a descriptive method, 185 students and 21 faculty members participated to provide satisfaction level on the adaptability and usability of LMS in Dentistry. Results revealed that the majority of faculty members are female, having 0-5 years of service in university, while the majority of students are female third year students. Majority of both faculty and students are using Fiber for internet connectivity and laptop as device for online class. Faculty agree that they were satisfied with the navigation and usability of LMS to the dental curriculum. Students agree that they were satisfied with the content of the e-Learning course, navigation, usability and e-learning teacher/assistant. Faculty members using fiber are more satisfied with usability. There was a significant difference in the level of satisfaction on content of e-learning course and e-learning teacher/assistant as perceived by students, with the second-year students being more satisfied than other year level. A plan of action was proposed to enhance the use of LMS to the dental curriculum.

Keywords: dental education, dentistry, learning management system, online learning, satisfaction

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1. Introduction

Dental education has been benefiting from several modalities of providing instruction and facilitating learning, especially during this time of pandemic when traditional face-to-face classroom setup has been prohibited. Before the COVID-19 pandemic, most dental subjects were delivered through the traditional classroom and laboratory setup where faculty and students can freely interact and assess learning levels in lecture and laboratory subjects. Learning Management System (LMS) began to be introduced to the universities to support innovation and integration of information technology to the dental education and teaching strategies. Those faculty members, trained and adept to the LMS offered by the university, were given an opportunity to engage with their students using this platform.

Given this innovative online platform, faculty and students would need to adapt into a new way of teaching and learning. It must not sacrifice the quality and integrity of education, rather enhance learning and widen the perspective of both learners and teachers to integrate advances in information technology to dental education. In the advent of the pandemic, there has been an abrupt transition of lecture and laboratory dental subjects into full online learning experience. This required both the instructors and the students to cope with learning how to navigate, use, and engage in the online platforms provided by the university to continue teaching and learning virtually.

In dental colleges experiencing limited resources and big class loads, online assessment can be employed at a low cost and with minimum demands on instructors and teaching time. A fully accessible learning management system like Moodle allows for comprehensive online assessment and can handle a variety of question forms based on students and faculty's technical abilities. Although technological obstacles and accompanying stress are concerns which must be addressed, dental students appeared to have a favorable view of this type of online assessment (El Tantawi, et al., 2015).

Although it is imperative to adapt and use LMS while face-to-face classes is still restricted, it is important to assess the overall quality of use of LMS to provide better dental education in the new normal. This research seeks to give a better understanding of the challenges students and faculty encounter when it comes to online education, specifically in using LMS. This may then be used to guide and advise Dentistry schools in developing an effective and productive online teaching platform aimed at enhancing dental students' learning experiences.

1.1 Objectives of the research

The goal of this study was to determine the overall quality of use of LMS by a private dental school, as well as the degree of satisfaction among the students and faculty. Specifically, it sought to: 1) Present the profile of the respondents according to sex, student's year level or faculty's length of stay in the university, types of internet connectivity, and types of devices, 2) Determine the level of overall faculty's satisfaction on LMS' navigation and usability, 3) Determine the level of overall students' satisfaction on LMS' content of e-learning course, navigation, usability and e-learning assistance, 4) Test the significant difference on the level of overall satisfaction on LMS as perceived by the student and faculty when grouped according to profile; and 5) Propose a plan of action to enhance the use of LMS in the dental education in the new normal.

2. Methods

Descriptive research design was used in this study. Before the data is analyzed, it is essential to first

understand the gathered data. To determine whether any adjustments need to be made to the data to make it suitable for analysis, descriptive statistics presents data in an organized way (McCarthy, et al., 2019).

The respondents of the study were 195 out of 394 Dentistry students in the first semester of SY 2021-2022. Using the Raosoft sample size calculator, 195 is the recommended sample size considering 5% margin of error and 95% confidence level. There are 21 out of 23 dental faculty members who participated. Using Raosoft sample size calculator, 21 is the recommended sample size considering 5% margin of error and 95% confidence level. Due to the current situation of limited social interaction caused by the pandemic, respondents were asked to answer the questionnaire regarding LMS satisfaction through an online platform using Google survey form.

In this study, the LMS satisfaction questionnaire designed by the institution's Center for Technology Enabled Education (CTEE) was used to assess satisfaction among students and faculty. Due to the restrictions brought about by the pandemic and the limitation of physical access with the students and faculty, data was gathered using Google forms questionnaires that were sent through active social media accounts of the respondents. Results of the survey were tallied by the researchers through Microsoft excel.

The data was analyzed by using frequency count and percentages to determine the number of responses and their percentages in terms of gender, year level or length of stay in the college, types of internet connection and devices used in online learning. Weighted mean was used to determine the students' and faculty's satisfaction level of LMS. Using ANOVA helped find out whether there are statistically significant differences on the level of overall satisfaction on LMS as perceived by the student and faculty when grouped according to profile.

The researchers guaranteed full confidentiality of the data and personal information gathered. With the use of consent form, the researchers were able to explain the nature, procedure, risks and benefits, voluntary nature and means to participate in the study. After getting their consent, participants were asked to answer the online questionnaire, and those who did not give their consent were excluded from the study.

3. Results and discussion

Table 1.1

Percentage Distribution of the Faculty Profile

	Frequency	Percentage
Age		
Male	6	28.6
Female	15	71.4
Years of Service		
0-5	7	33.3
6-10	4	19.0
11-15	4	19.0
16-20	1	4.8
more than 20 years	5	23.8
Internet connectivity used for online class		
DSL	1	4.8
FIBER	14	66.7
Wireless broadband	6	28.6
Devices used for online class		
Personal computer / desktop	1	4.8
Laptop	18	85.7
Tablet	2	9.5

Table 1.1 presents the Percentage distribution of the Dentistry faculty profile. Majority of them are female (71.4%), while there were only 6 male faculty (28.6%). Majority of them have 0-5 years of service (33.3%) in the university, followed by those with more than 20 years of service (23.8%). Least number of faculty members has 16-20 years of service (4.8%). Majority used Fiber (66.7%) as their internet connectivity for online class, followed by wireless broadband (28.6%) and only one faculty used DSL (4.8%). Most faculty used laptops (85.7%) as devices for online class, followed by tablets (9.5%) and one faculty used a personal computer or

desktop (4.8%).

According to McDermott et al. (2018), although women were underrepresented in all academic ranks except the entry-level one, it is encouraging to note that female academics at every rank had more recent degrees than their male counterparts. Contrary to what has been observed in other medical disciplines, this pattern is unique. Majority of the dental faculty are very young in their teaching career, with five or less years in teaching. This is due to the sudden increase in the enrollees in the recent years, which required a wider pool of clinical instructors and faculty members.

Fiber is the most used internet connectivity of dental faculty members because of its wide availability, efficient speed and convenience of use. Fiber internet connectivity is most used because of its high speed and reliability in connection. The African government seeks to ensure that all African people, businesses, and governments are digitally enabled by 2030 and so find it crucial to connect African universities to low-cost, high-speed broadband internet. Although there are significant differences between nations in North Africa, Eastern Africa, and Southern Africa, on the whole, they all have at least a national fiber optic backbone and a high level of international connectivity. It will be necessary to produce the high-quality, advanced digital skills needed to adapt to and use digital technologies through revised university curricula and quick skill development initiatives (Bashir, 2020). Laptop is used widely among faculty members because of its portability and efficiency of use for instruction. Both laptops and smartphones can be useful teaching tools, enabling a variety of teaching methods in the classroom. According to Kara et al. (2022), both smartphones and laptops worked well for finishing the tasks, but students believed laptops to be superior to smartphones.

Table 1.2

Percentage Distribution of the Students' Profile

	Frequency	Percentage
Sex		
Male	33	16.9
Female	162	83.1
Years Level		
1	34	17.4
2	56	28.7
3	64	32.8
4	17	8.7
5	1	0.5
6	23	11.8
Internet connectivity used for online class		
DSL	27	13.8
FIBER	111	56.9
Wireless broadband	37	19.0
Mobile data/hotspot	20	10.3
Devices used for online class		
Personal computer / desktop	17	8.7
Laptop	134	68.7
Tablet	15	7.7
Smartphone	29	14.9

Table 1.2 presents the Percentage distribution of the Dentistry students' profile. Majority of the students are female (83.1%), while 16.9% were male. Majority of the students are in the third year of their collegiate level (32.8%), followed by those with in second year (28.7%), and least one is from fifth level (0.5%) Majority of the students used Fiber (56.9%) as their internet connectivity for online class, followed by wireless broadband (19%), and DSL (13.9%) and mobile data/hotspot used least as connection (10.3%). Most of the students used laptops (68.7%) as a device for online class, followed by smartphone (14.9%), personal computer/desktop (8.7%) and tablet used least as device (7.7%).

The study reveals that the majority (83.1%) of dental students are now women, signifying a significant departure from the historically male-dominated dental profession. This transformation aligns with changing

cultural norms and the gradual acceptance of women into dentistry over time (Gallagher & Scambler, 2021). Additionally, broader societal trends, as highlighted by Gao (2022), show that more women are pursuing educational programs related to arts and social sciences, reflecting their increasing presence in various professional domains, including dentistry. This shift towards greater gender diversity promises a more inclusive and diverse future for the field of dentistry. In addition, because dentistry as a medical subspecialty requires use of arts and interpersonal skills providing treatment to the patients, more women are becoming interested in studying dental medicine. Because women are more inclined to practicing social skills and nurturing good interpersonal relationships, this has become an advantage for women in the dental practice. Due to these advantages and natural inclination for women to care and provide esthetic services, more women are specializing in dental medicine.

Similarly, fiber is the most used internet connectivity among students because of its wide availability, efficient speed and convenience of use. Students who have access to an internet or fiber connection at home are prepared for flexible learning (Camara, 2022). The absence of fast, affordable, and dependable internet connections could impede the process of online learning and restrict access to e-platforms like learning management systems, which puts students and teachers at risk. Laptop is also used widely among students because of its portability and efficiency of use for learning. When it comes to student interaction with the videos, teamwork, and device satisfaction, using laptops has produced better results in order to maximize the convenience of the student, the type of mobile device used in activities that take into account the use of videos in a collaborative class needs to be carefully chosen. This will have an effect on their engagement with the video-based learning activity as well as their positive behavior and experiences in the collaborative context (Albó et al., 2019).

Table 2.1

Faculty Level of Satisfaction in terms of Navigation

Indicators	Mean	Interpretation	Rank
I can easily navigate from one task to another within LMS.	3.33	Agree	2
The students can easily navigate back to the start of the course module	3.38	Agree	1
The e-Learning module allows students to actively interact with the program.	3.10	Agree	4.5
The e-Learning module allows students to control the pace of learning	3.10	Agree	4.5
The organization and sequence of the course was easy to create in LMS	3.19	Agree	3
Composite Mean	3.22	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 2.1 presents the Faculty Level of Satisfaction in terms of Navigation. The composite mean of 3.22 denotes that faculty members agree to be satisfied with navigation of LMS software. Faculty agreeing to the students easily navigating back to the start of the course module, ranked highest among the values listed, and weighted mean of 3.38, followed by the faculty agreeing that they can easily navigate from one task to another within LMS (3.33) and the organization and sequence of the course as easy to create in LMS (3.19).

LMS has a user-friendly layout and presented in a way that the students could easily navigate on the main menu and subcategories of their courses. The dashboard is effective in presenting the overall contents of the LMS to help the students find their way in doing the needed tasks for their courses, with set deadlines and according to priority. Most modern learning management systems are user-friendly that can accommodate a range of age groups. The management should consider helpful constructs in order to encourage faculty members to keep using an LMS. A crucial source of motivation for faculty members is ensuring they have the support of their peers and supervisors and maintaining the LMS's high standards. It is advised that peer mentoring from individuals close to the faculty member helps boost their motivation to use an LMS (Soledad, et al., 2020).

Perceived usefulness, ease of use, and social norms have an impact on users' intentions to use an LMS. Simultaneously, perceived usefulness is influenced by perceived ease of use, social norm, and user interface design, while perceived ease of use is influenced by computer self-efficacy and user interface design (Eraslan & Kutlu, 2019). Hence, it is important that the design elements used in LMS support ease of use to support

instruction and learning. In dental education, faculty has a wide range of topics to teach to the students. Programs which include learning laboratory and clinical skills, would need a convenient mode of delivering the principles and techniques, which will not sacrifice the in-depth understanding and comprehension of the students.

The proper operation of host servers, constant equipment monitoring, and consideration of platform usability are necessary for effective online learning. Public educational institutions like schools, colleges, and universities, particularly in less developed nations, prefer traditional teaching methods and are only slowly transitioning to innovative models. Educational institutions have a great need for user-friendly, flexible e-learning platforms that are appropriate for different users. (Shurygin, et al., 2021). Therefore, the navigation and user-friendly design elements of LMS should consider the capability of the students to use and adapt to innovation applied in their academic tasks. In the context of dental education where there is a wide scope of subjects and topics to be learned theoretically and clinically, having a user-friendly and easy to navigate LMS is an indispensable support to student learning and faculty instruction. Meanwhile, even though interpreted as faculty members agreeing to the values listed, the e-Learning module allowing students to actively interact with the program, and allowing students to control the pace of learning got the lowest rank, both with weighted mean of 3.10.

Because LMS has limited functions for various interactive tools used for learning, as well as the limited awareness among faculty on the use of these interactive tools, interaction between faculty and students is less. Good communication and interaction are vital in online learning environments. Faculty employed teaching strategies and they constantly developed them to enhance communication among learners and teachers. Understanding the importance of online communication and interaction, educational institutions must take into consideration the various factors in developing well-structured, engaging and dynamic online programs for students in higher education (Vlachopoulos & Makri, 2019).

Dental clinical skills are developed through demonstration, feedback and progressive practice of effective techniques taught in the pre-clinical years. Faculty must have a means to communicate well to the students any feedback to improve the students' skills and deepen their understanding of the various dental treatments offered to patients. LMS of a dental institution may provide means to facilitate easy interaction and communication between students and faculty members, as well as dental experts as resources for the dental specialties. Good interaction between faculty and students in the LMS environment may mimic the traditional classroom interaction, where helpful discussion is a venue for questions and concerns are addressed and key points are clarified.

Table 2.2 presents the Faculty Level of Satisfaction in terms of the LMS. Faculty agreeing that the e-Learning course module is easy to open when the students logs, assessment tools in LMS being easy to use, and help information in LMS being useful all ranked highest among the values listed, with weighted mean of 3.19, followed by the faculty agreeing that LMS was straightforward (3.14) and intuitive and was used effectively by students (3.14). Having good presentation of the organization of its content, help information is also available and easily accessed when a question mark icon is seen in any parts of the interface. Adequate explanation is given in a concise and clear manner for the users. Providing this helpful information makes a dental faculty task on learning the design elements of the LMS, which can be used for instruction and assessment of student's learning.

Table 2.2 shows that all LMS share the same pedagogy, learner environment, instructor tools, course and curriculum design, administrator tools, and technical specification features. However, a study by Mpungose (2020) indicated that the personal feature for students that would inspire them to learn and be passionate about using online resources is missing from the learning management system. Rationale, time management, and e-learning objectives all play a role in selecting the resources to use and the courses to offer. It poses a challenge for dental faculty members to use the necessary tools in LMS to motivate and assist dental students in achieving well in their program.

Table 2.2*Faculty Level of Satisfaction in terms of Usability*

Indicators	Mean	Interpretation	Rank
The e-Learning course module is easy to open when the students log in	3.19	Agree	2
The module runs smoothly every time the students are using it	2.90	Agree	8.5
The screen presentation enhances learning (e.g. good use of graphics clear text, well layout, good use of color)	3.10	Agree	6.5
Provides the students with various options to select extra information, new materials and review previously learn materials.	3.10	Agree	6.5
There are no difficulties creating class assignments in LMS.	2.90	Agree	9.5
Assessment tools in LMS are easy to use.	3.19	Agree	2
Help information in LMS are useful.	3.19	Agree	2
There are no difficulties on posting and importing of grades in LMS.	2.95	Agree	8
LMS was straightforward and intuitive.	3.14	Agree	4.5
LMS was used effectively by students.	3.14	Agree	4.5
Composite Mean	3.08	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Using an LMS may be complicated even if the technology is available if there is inadequate training, motivation, and rewards (Soledad et al., 2020). People in the workplace play an important role in a faculty's decision to take advantage of the LMS. Furthermore, the LMS's dependability and timeliness, as well as management's existing practices for its adoption, are critical ingredients for the LMS's actual use. Even though interpreted as faculty members agree to the values listed, having no difficulties creating class assignments in LMS and module running smoothly every time the students are using it got least rank with weighted mean of 2.90, followed by having no difficulties on posting and importing of grades in LMS (2.95).

Faculty are having difficulties when creating various types of assignments. This is because of the complexity and breadth of the concepts in Dentistry and the limited types of activities in the LMS. Aside from these, not all faculty members are well-trained and highly aware of the use and functions of the activity types in the LMS. Some of them are using other virtual platforms to deliver instruction to the students. Because most of the dental subjects teach clinical skills and require laboratory activities, faculty members are finding other ways of teaching the students aside from the constructs of LMS. Administrators and faculty members believed they were prepared in terms of their skills in selecting and integrating digital resources for teaching and learning because they are also provided with training opportunities through seminars and conferences related to technological literacy. However, neither of them is adept at using the LMS or other online learning tools (Alda et al., 2020).

Table 2.3 summarizes faculty level of satisfaction in using LMS. Faculty agree that they were satisfied with the navigation and usability of the LMS to the dental curriculum offered by the university. Dental faculty members are using LMS as one of the main platforms for teaching their students. This digital tool is highly appreciated among them, as they were also given basic training and technical support by the university. Endozo, et al. (2019) encourage faculty members and school administrators to maximize the use of technology and find a reliable learning management system to support instruction and student learning. Even though dental education relies heavily in face-to-face instructor-learner interaction and laboratory skill practice, dental faculty members may employ innovative strategies to effectively teach the dental science and clinical skills through existing technological infrastructure of the university, as well as explore other helpful means to deliver instruction efficiently to the students. Strong administrative support, continuing faculty development and technical assistance could enhance the thrust towards quality dental instruction using LMS and new technologies.

Table 2.3*Summary Table on Faculty Level of Satisfaction of LMS*

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Navigation	3.22	Agree	1
2. Usability	3.08	Agree	2
Composite Mean	3.15	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 3.1 presents the Students' Level of Satisfaction in terms of Content of E-Learning Course. The composite mean of 3.39 denotes that the dental students agree to be satisfied with the e-learning course content in LMS. Students agreeing that the requirements for completion of the course were clearly outlined, ranked highest among the values listed, with weighted mean of 3.48, followed by the students agreeing that the content incorporates deep level questions which promotes critical thinking (3.42), and the presentation of course topics being clear (3.40).

Table 3. 1*Students' Level of Satisfaction in terms of Content of E-Learning Course*

Indicators	Mean	Interpretation	Rank
The content is appropriate to the level of the student	3.36	Agree	6
The content is accurate, up-to-date and relevant to the course/subject at hand.	3.39	Agree	4.5
The presentation of course topics was clear	3.40	Agree	3
The requirements for completion of the course were clearly outlined.	3.48	Agree	1
The content incorporates deep level questions which promotes critical thinking.	3.42	Agree	2
The objectives and concepts of the e-learning course module are clear, and student knows exactly what the materials are all about.	3.39	Agree	4.5
The learning activities and assessment are clear and easy to follow.	3.34	Agree	7
The feedback from the learning activities and assessment is timely and appropriate.	3.30	Agree	8
Composite Mean	3.39	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Requirements for course completion were evidently outlined in the LMS, and students are able to access them conveniently from the dashboard. LMS provided adequate reminders and notification to students about deadlines and list of due requirements per course. It makes it easy for students to prioritize and manage their time if finishing the requirements. One of the key criteria for user satisfaction is whether the LMS can offer the needed features for learning and instruction. Additionally, actual use as well as user satisfaction can both predict the net benefits of using an LMS (Soledad, et al., 2020). Fortunately, there are also various activities and assessment tools in the LMS. These include assignment, feedback, open forum, survey, interactive content, Turnitin assignment, workshops and others. Lesson materials, including tests, homework, practical exercises, discussions, and resources, can be made available to students. These materials, which can be integrated in the LMS, include a PDF, e-book copy and other online links. The platform can also be used to create content, which students can upload, share, and use to collaborate on projects with their instructors as well as other learners (Navarro, et al., 2021).

Meanwhile, even though interpreted as students agreeing to the values listed, the feedback from the learning activities and assessment being timely and appropriate got the lowest rank, both with weighted mean of 3.30, followed by the learning activities and assessment being clear and easy to follow. (3.34) and the content being appropriate to the level of the student (3.36). Due to the increasing number of students and the distribution of requirements per course per section, it is challenging for faculty members to provide in-depth feedback to each activity of individual students. Quantitative assessment gives more objective feedback to the students, where correct and incorrect answers are given ratings immediately and released to the students based on the setting of the activity. Initiatives for programmatic and institutional assessment have been developed across higher education institutions. These resulted from a growing focus on evaluating the quality of education that takes place during the course of collegiate years (Burrack & Thompson, 2021). Understanding these assessments will enable the institution to provide the best approach to enhance the curriculum and adapt to the evolving needs of the students and faculty.

Table 3.2 presents the Students' Level of Satisfaction in terms of Navigation. The composite mean of 3.31 denotes that students agree to be satisfied with navigating in LMS. Students agreeing that the e-Learning course module being easy to open when the students log in, ranked highest among the values listed, with weighted mean of 3.40, followed by students can easily navigate back to the start of the course module (3.36), and e-Learning module allowing students to control the pace of learning (3.34).

Table 3.2*Students' Level of Satisfaction in terms of Navigation*

Indicators	Mean	Interpretation	Rank
It is easy to move back and forward through a section of the course module.	3.2	Agree	5
The students can easily navigate back to the start of the course module.	3.36	Agree	2
The e-Learning module allows students to control the pace of learning.	3.34	Agree	3
The e-Learning module allows students to actively interact with the program	3.33	Agree	4
The e-Learning course module is easy to open when students logs in.	3.40	Agree	1
The module runs smoothly every time the students are using it.	3.14	Agree	7
I can easily download contents or assignments so that I can work offline.	3.33	Agree	6
Composite Mean	3.31	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Similarly, students are also satisfied with the navigation in LMS because they could conveniently access and navigate back to the start of the course module due to the user-friendly interface of the LMS. The e-Learning module also allowed students to control the pace of their learning since most of the learning materials are readily available and uploaded by the faculty members for their study. Adequate time is also given to the class to complete the requirements, and these are ordered and presented on the dashboard for easy reminders for the students. According to Zhang et al. (2020), the majority of students prefer to finish their assignments before the due date, and so having a convenient reminder of the deadline is an important tool for helping the students finish their activities before its due date.

Meanwhile, even though interpreted as students agree to the values listed, the module running smoothly every time the students are using it got the lowest rank, with weighted mean of 3.14, followed by students easily downloading contents or assignments so that they can work offline (3.33) and the ease to move back and forward through a section of the course module (3.29). Module running smoothly every time the students are using it got the lowest rank due to several experiences of the students of crashes and lagged time while using the LMS. This is partially due to their quality of internet connectivity and their device. One of the reasons why LMS may not run smoothly could be technical problems and poor maintenance of the system, and too many users accessing the site all at once. According to Camara (2022), the absence of speedy, economic, and dependable internet connection may impede the process of online learning, restricting access to online platforms like LMS, which puts students and teachers at risk. Due to power outages, students cannot fully benefit from the lessons that are broadcast or, worse, they miss the lesson given that day. Due to the intermittent power outages and unstable, weak, and poor internet connection, it was challenging to download instructional materials from the LMS.

Table 3.3*Students' Level of Satisfaction in terms of Usability*

Indicators	Mean	Interpretation	Rank
LMS is easy to use.	3.43	Agree	2
The screen presentation enhances learning (e.g. good use of graphics clear text, well layout, good use of color)	3.44	Agree	1
LMS provides the students with various options to select extra information, new materials and review previously learn materials.	3.41	Agree	3
I am satisfied with the amount of online interaction I had with other students in the course	3.25	Agree	5
Using LMS has improved my learning.	3.22	Agree	6
LMS fits my learning style.	3.12	Agree	7
LMS is an innovative approach to learn.	3.36	Agree	4
Composite Mean	3.32	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 3.3 presents the Students' Level of Satisfaction in terms of usability. The composite mean of 3.32 denotes that students agree to be satisfied with the usability of LMS. Students agreeing that the screen presentation enhances learning ranked highest among the values listed, with weighted mean of 3.44, followed by LMS' ease of use (3.43), and LMS providing the students with various options to select extra information, new materials and review previously learned materials. (3.41).

LMS has good design, with screen presentation that promotes learning as seen in its good use of graphics, clear text, layout, and good use of color. Being visually pleasing and organized helps make the learning material easily understood and appreciated by the learners. This facilitates ease of use and good appeal to the users.

The promising benefits of LMS can be realized with an investment in its visual design. Grant-Smith, et al. (2019) investigated the connection between LMS aesthetics and usability and student engagement through the reflections of instructors, a learning designer, and students. They suggest visual design guidelines and practices that emphasize how transactional access, visual identity, and aesthetic appeal all work together to improve user experience and student engagement in an online learning environment.

Even though interpreted as students agree to the values listed, LMS fitting the students' learning style attained the lowest rank, having weighted mean of 3.12, followed by using LMS improving students' learning (3.22) and students being satisfied with the amount of online interaction they had with other students (3.25).

Because Dentistry is a complex branch of health and medical science, it is difficult to fit a structured LMS to various learning styles of students. LMS may tend to be objective and limited in the learning materials it offers, and not all learning styles may be catered given this constraint. Limited as well by the novelty of use of LMS by faculty and students, it takes time before both faculty and students can adapt to the function of the LMS. According to Konnova, et al. (2021), it is not possible to automatically apply the knowledge assessment system for online learning to evaluate students in any educational setting; rather, it should be customized for them. This also applies to Dentistry, that faculty must adapt teaching strategies and learning materials adapted to the skills and needs of the students to further enhance their clinical skills and strengthen their foundation in various dental specialties.

Table 3.4

Students' Level of Satisfaction in terms of E-Learning Teacher / Assistant

Indicators	Mean	Interpretation	Rank
Provides orientation to students about the concepts of the e-Learning course module	3.42	Agree	1
Provides help to students encountering difficulties during the e-Learning class activity	3.32	Agree	3.5
Provides guide questions to students to facilitate learning.	3.39	Agree	2
I am satisfied with the online interaction I had with my instructor.	3.32	Agree	3.5
Composite Mean	3.36	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 3.4 presents the Students' Level of Satisfaction in terms of E-Learning Teacher / Assistant. The composite mean of 3.36 denotes that students agree to be satisfied with being an E-Learning Teacher / Assistant of LMS. Students agreeing that they were provided with orientation about the concepts of the e-Learning course module (3.42) ranked highest among the values listed, with weighted mean of 3.42, followed by the provision of guide questions to students to facilitate learning (3.39).

Because faculty members are providing class orientation during the start of each semester, the highest rank of students agreeing that they were provided with orientation about the concepts of the e-Learning course module can be observed. It is important for students to be familiar with the dynamics of their online learning especially as this mode of learning is very new to them and that it takes time for them to comprehend all the online content and activities of their courses. Aside from being familiar with the content, studies guide questions are also helpful for the student's learning as these will direct the course flow and provide a method for the students to process the information and objectives of the course.

Students get motivated if they are fully engaged in online learning. According to the results of the study by Almoayad et al. (2020), only 13.8 percent of students taking up health sciences said that switching to emergency remote teaching (ERT) had increased their desire to learn. Students also showed that the abrupt switch to e-learning had a significant impact on their independence and responsibility for learning. Guiding these students in their online learning helps them cope up with their academic load and make them more engaged in their

studies. Additionally, over the course of the semester, both first- and second-year radiography students struggle with a lack of motivation and focus. (Lee, 2021). To prevent this lack of motivation and focus, assistance may be given to the students to give them a sense of direction and drive to complete their online learning.

Even though interpreted as students agreeing to the values listed, provision of help to students encountering difficulties during e-Learning class activity and being satisfied with online interaction students had with my instructor got the lowest rank, both with weighted mean of 3.32. Because of the abrupt transition of the students from traditional classroom setup of learning to purely online learning, students encountered a lot of difficulties during their online classes. There is also very limited interaction between faculty and students that hampered their learning experiences. Limited functionality and awareness of the online platform results in poor interaction and difficulties on the part of the students. Clinical practice has been disrupted in allied health courses like dentistry, nursing, medical technology, radiographic technology, and physical therapy because of the switch from traditional classroom to online instruction. This results in students having insufficient clinical skills, which has been a problem for e-learning (Teo, et al 2020). In addition, no current teaching method can replace the acquisition of skill by practicing on real patients by dentistry students (Iosif et al, 2021).

Table 3.5

Summary Table on Students' Level of Satisfaction

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Content of E-Learning Course	3.39	Agree	1
2. Navigation	3.31	Agree	4
3. Usability	3.32	Agree	3
4. E-Learning Teacher / Assistant	3.36	Agree	2
Composite Mean	3.34	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 3.5 summarizes the students' level of satisfaction, revealing that students were satisfied with the content of the e-Learning course, navigation, usability and e-learning teacher / assistant. Students are most satisfied with the content of the e-learning course with weighted mean of 3.39, followed by e-learning teacher/assistance (3.36), usability (3.32) and navigation (3.31) as least. The LMS is considered by the students to be easy to use, simple to learn, updated, offers output based on their needs, and aids them in completing assignments and academic tasks. In general, It demonstrates that the students were happy with the LMS and would continue to be so in the future and that it has advantages for the students (Navarro, et al., 2021). For dentistry students, organization of course content is very important, since this enables the student to learn the different topics comprehensively. Having an easily accessible data bank of learning materials is essential to the mastery of dental science and clinical skills.

Table 4.1

Difference Responses on the Faculty Level of Satisfaction When Grouped According to Profile

Sex	t / F- value	p-value	Interpretation
Navigation	0.708	0.488	Not Significant
Usability	0.613	0.547	Not Significant
Years of Service			
Navigation	0.757	0.568	Not Significant
Usability	0.845	0.517	Not Significant
Internet connectivity used for online class			
Navigation	2.225	0.137	Not Significant
Usability	4.614	0.024	Significant
Devices used for online class			
Navigation	0.228	0.798	Not Significant
Usability	0.036	0.965	Not Significant

Legend: Significant at p-value < 0.05

Table 4.1 disclosed the comparison of responses on the faculty members level of satisfaction when grouped according to profile. It was observed that there was significant difference on usability since the obtained p-value

of 0.024 was less than the alpha level. This means that the responses vary statistically and based on the post hoc test conducted, it was found out that those who use fiber are more satisfied with usability. Higher educational institutions should consider supporting the use of fiber connection in order to encourage faculty members to conveniently use an LMS. If high speed internet such as fiber connection is made available for faculty use, it would make instruction faster and efficient, thereby increasing the utilization of LMS, adapting it to the needs of the students. It facilitates work efficiency and engagement between student and faculty, hence supporting quality instruction and learning. An important source of motivation for faculty members is ensuring they have technical support, connectivity, proper training and maintaining the LMS's high standards. Soledad, et al. (2020) advised that peer mentoring from individuals close to the faculty member help boost their motivation to use an LMS.

Table 4.2

Difference Responses on Students Level of Satisfaction When Grouped According to Profile

Sex	t / F- value	p-value	Interpretation
Content of E-Learning Course	0.316	0.752	Not Significant
Navigation	0.415	0.679	Not Significant
Usability	1.607	0.110	Not Significant
E-Learning Teacher / Assistant	1.388	0.167	Not Significant
Year Level			
Content of E-Learning Course	5.200	0.000	Highly Significant
Navigation	2.144	0.062	Not Significant
Usability	2.200	0.056	Not Significant
E-Learning Teacher / Assistant	4.012	0.002	Significant
Internet connectivity used for online class			
Content of E-Learning Course	0.321	0.811	Not Significant
Navigation	0.882	0.452	Not Significant
Usability	0.684	0.563	Not Significant
E-Learning Teacher / Assistant	0.882	0.452	Not Significant
Devices used for online class			
Content of E-Learning Course	1.112	0.345	Not Significant
Navigation	1.607	0.189	Not Significant
Usability	2.293	0.079	Not Significant
E-Learning Teacher / Assistant	1.671	0.175	Not Significant

Legend: Significant at p-value < 0.05

Table 4.2 presented the comparison of responses on the students' level of satisfaction when grouped according to profile. It was observed that there was a significant difference in the content of e-learning course and e-learning teacher / assistant because the obtained p-values were less than the alpha level. This means that the responses differ significantly and based on the post hoc test conducted, it was found out that second-year students are more satisfied than other year level students. Since the second-year student has learning and engagement experience in their previous years, they were able to adjust to the learning modalities and interaction with their instructors. They were able to adjust to the challenges of online learning, thereby yielding more satisfaction in the LMS use. Given their previous years' experience of the developed learning management system, they were able to manage their expectations for LMS, employ the necessary study skills and develop their study habits in online learning.

The majority of medical and allied health students said that online classes, which combine video programs and live interaction, are more advantageous and enjoyable than traditional classes, according to Debnath (2021). In addition to taking online classes, the students also received daily academic achievement monitoring as well as consistent online counseling for psychological and mental support.

What most second-year dental students find helpful is the course content of e-learning and teacher/assistance to e-learning. Providing students with adequate, comprehensive and user-friendly tools in organizing learning materials and activities is important to dentistry students. With the helpful guide and information background on how to properly use the LMS, which holds the course content and comprehensive topics of each program, it is easier and more convenient for students to engage the learning materials and reach out to their instructors and peers. Course content and e-learning assistance are critical factors necessary for dental students' use of LMS.

Dental colleges and institutions may consider developing ways of maximizing the use of LMS to provide students with comprehensive course contents, activities and other learning materials, with allowance of helpful guides and e-learning teachers to facilitate easy navigation of the students as they use LMS.

Table 5.

Plan of Action to enhance the Faculty and Students' Use of LMS to the Dental Curriculum

KRA/ Objectives	Strategies	Expected Outcome	Persons Responsible
FACULTY			
Navigation to facilitate faculty-student interaction when using e-learning module	Faculty members may be trained to incorporate new online interactive teaching strategies as part of the e-learning module Provision of fast speed internet access in the university for more convenient accessibility and interaction among stakeholders	Improved interaction between faculty and students	CTEE/ LMS administrators, HRMD, Faculty members
Usability to handle difficulties in creating class assignments in LMS	Faculty members may collaborate and consult with other faculty members, MISD or technical experts in handling difficulties in creating class assignments	Enhanced technical support	CTEE/ LMS administrators, Faculty members
STUDENTS			
Content of E-Learning Course to receive timely and appropriate feedback from learning activities and assessment	Students may request for easy access for timely feedback and notification in the grading and comments of accomplished learning activities and assessment	Up-to-date dissemination of feedback and grades	Dentistry Faculty members, students
Navigation to ensure module runs smoothly every time the students are using it	LMS administrators may schedule regular maintenance at times where students and faculty least used the system; provide timely announcement of LMS maintenance	Better navigation and efficient access to the LMS	CTEE/LMS administrators, Dentistry Faculty members, students
Usability to ensure that LMS fits the students' learning style	Faculty may assess the learning style of the students and adapt it to the teaching strategies for the program	Improved academic performance and improved learning style	Dentistry Faculty members, students
E-Learning Teacher/Assistant to provide help to students encountering difficulties during the e-Learning class activity	Students may seek prompt technical assistance when encountering problems in LMS	Strong and prompt technical support to students	CTEE/LMS administrators, Dentistry students

4. Conclusion and recommendation

Majority of the Dentistry faculty members are female, having 0-5 years of service in the university, while the majority of the Dentistry students are female third year students. Majority of both faculty and students are using Fiber as their internet connectivity and laptop as device for online class. Faculty agree that they were satisfied with the navigation and usability of the LMS to the dental curriculum offered by the university. Students agree that they were satisfied with the content of the e-Learning course, navigation, usability and e-learning teacher / assistant. There is a significant difference on the level of satisfaction on LMS' usability as perceived by faculty when grouped according to profile. Those who use fiber are more satisfied with usability. There was a significant difference on the level of satisfaction on content of e-learning course and e-learning teacher / assistant as perceived by the students when grouped according to profile, with the second year students being more satisfied than other year level. A plan of action was proposed to enhance the use of LMS to the dental curriculum.

Higher educational institutions may invest in technological infrastructure and provide training to faculty members and students to incorporate new online teaching strategies that are more interactive and dynamic. The administrators may consider providing higher speed internet connection in several key points and classrooms of the university, to support high flexibility of online and hybrid learning. Dental schools may promote collaboration among faculty members: encouraging younger faculty members to share technical assistance in online teaching to the tenured members, and tenured members providing insights in good teaching practice and experience to the younger batch of faculty members. Technology administrators may provide regular training to both faculty and students in using LMS. The proposed action plan may be presented to the dental schools to further discuss any innovative strategies when applying LMS to the dental curriculum. Future researchers about

factors that correlates dental academic performance and the use of LMS maybe conducted to enhance efficiency of a dental LMS.

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