PERCEPTION OF UNDERGRADUATES ON THE USE OF LEARNING MANAGEMENT SYSTEMS (LMS) FOR LEARNING CHEMISTRY CONCEPTS

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Abstract
The study examined perception of undergraduates on the use of learning management systems (LMS) for learning Chemistry concepts. The study made use of descriptive survey type. Sample of 84 undergraduates were randomly selected among undergraduates of Al-Hikmah University, Ilorin, University of Ilorin, Ilorin and Kwara State University, Malete. The instrument used for collection of data was a questionnaire designed by the researchers for the purpose of examining undergraduates' perception on the use of LMS for learning Chemistry concepts. The instrument used in this study was validated by experts to determine the face and content validity of the instrument. The reliability of the instrument was measured using Cronbach Alpha and the result yielded 0.92. Four research questions and three null hypotheses were tested. Paired sample t-test was used in testing the hypotheses at 0.05 level of significance and the research questions were answered using percentage. The findings reveal that undergraduates possess positive perception towards learning management systems as gender, course of study, year of study influence the opinion of undergraduates on the use of LMS for learning Chemistry concepts. It was recommended that University managements should facilitate the installation and the use of LMS platform for both teaching and learning activities.

Keywords: Learning Management System, Perception, Use

Introduction

Scientific knowledge can be described as the pivot that supports the development of any nation through scientific inventions, innovations, discoveries and applications. The simplicity of scientific concepts can improve the performance in the way of solving problems of the society through scientific thoughts and critical analysis. Chemistry as a branch of science is conceptual, rational and mathematically oriented and it is core to science and technology. It initiates a strong connection in revolutionizing the economy, security, ecological influence and other scientific sphere of life of a nation (Ejidike & Oyelana, 2015). The learning of Chemistry by students at all levels is attributed to certain challenges: understanding fundamental chemistry concepts, scientifically incorrect ideas, language problem, cognitive level of students etc. Some concepts in Chemistry are abstract in nature and it calls for real understanding of these concepts devoid of ambiguity through the instructional methods (Sirhan, 2007).

In the effort to simplify the learning of abstract concepts in identified subject areas, platforms such as Learning Management Systems (LMS) which is a class of e-learning process has been adopted. E-learning has being described as the type of learning conveyed through various information and communication technology aimed at improving the quality of teaching and learning in a given context (Dagada & Mungai, 2013). LMS is a web-based systems that allow instructors and/or students to share materials, submit and return assignments and communicate online. LMS are characterized with immediate accessibility of learning materials to students; allow a good interaction between instructors and students and sustainable collaborations among learners through a medium devoid of physical contact or face-face interaction. Some of these LMS used for creating and managing e-learning-based courses are Moodle, TelEduc, BlackBoard, WebCT, Toolbook, TopClass Server, web-based homework, among others (Lopes, 2014). Beyond instruction delivery and routine assessment of students' academic performances, LMS are

becoming interface for handling course registration, conducting quizzes and examinations and many others for smooth functioning of higher institution administration, (Kulshrestha & Kant, 2013). The integration of LMS for handling academic activities can be premised on the perception of the users.

According to Al-Busaidi (2012), factors such as learner's computer anxiety, technology experience, and personal innovativeness to use new technologies have significant effect on the learner's perception regarding the use of LMS. Positive perceptions towards the integration of LMS for instructions and efficiency of educational process can increase learning competence, develop self-study habit and strengthened LMS used effectiveness (Omotunde, 2015). Web-based homework tool is one of the LMS employed by instructors to aid learning, and it was reported that it increases mathematical understanding of concepts whereby students were motivated to complete more homework, acknowledge the need for help and seek assistance from others using the platform (Hodge, Richardson & York, 2009). LMS has been perceived to be augmenting pedagogical and learning experiences (Dahlstro, Brooks & Bichsel, 2014). LMS are valuable in terms of the content sharing feature, content module (file management), posting and submission, discussion platform/threaded discussion tool etc.

These features can be regarded as document management oriented communication tools which are frequently used to justify its value-ability. However, some tools are more interactive (like chat, wiki etc.) in feature but are mostly not frequently employed for instructional purpose, therefore rated as not valuable (Lonn & Teasley 2009). The use of more advanced and valuable features of the LMS for users' satisfaction was rated lowest in relation to the features designed to foster collaboration and engagement (Dahlstrom, Brook & Bichsel, 2014). The most valued features of the LMS are the content module (file management), threaded discussion and the chat tools which enriched the course content and assist instructors and students to achieve the desired course goals (Lonn, 2009). Some factors that influence the overall behavioral intentions to use LMS are: perceived ease of use, perceived usefulness and attitude towards usage (Alharbi & Drew, 2014).

With LMS as potential medium for effective learning and instructional delivery process, the perception and attitudes of undergraduates in the sciences, with specific reference to Chemistry in terms of application and utilization of the platform need to be examined. Hence, this study was conducted to determine the perception of undergraduates towards the use of learning management system for learning Chemistry.

Research Questions
1. How do undergraduates perceived the use of LMS for learning Chemistry concepts?
2. Does gender influence the perception of undergraduate towards the use LMS for learning Chemistry concepts?
3. Does course of study influence the perception of undergraduates towards the use of LMS for learning Chemistry concepts?
4. Does year of study influence the perception of undergraduates towards the use of LMS for learning Chemistry concepts?

Research Hypothesis
Ho_1: There is no significant difference between gender and perception of undergraduates on the use of LMS for learning Chemistry concepts.
Ho_2: There is no significant difference between course of study and perception of undergraduates on the use of LMS for learning Chemistry concepts.
Ho_3: There is no significant difference between year of study and perception of on the use of LMS for learning Chemistry concepts.

Research Methodology

This study adopted a survey method of descriptive research. A researcher-designed questionnaire was used to collect data and obtain relevant information needed for the study. The target population for this study was undergraduates of Chemistry and related courses like Biochemistry, Industrial Chemistry and Chemistry Education. The questionnaire is divided into section A and B. Section A collect information on demographic information of the undergraduates, such as: course of study, year of study and gender while section B employed 5-point Likert response scale to elicit responses on perception of undergraduates toward LMS for learning Chemistry concepts. The 5-point Likert scale were rated 5 (Strongly disagree), 4 (Disagree), 3 (Undecided), 2 (Agree) and 1 (Strongly Agree). The questionnaire was subjected to validity test by given it to five lecturers in related departments and the observations raised were effected before the production of the final draft. The questionnaire was then subjected to reliability test of Cronbach Alpha Coefficient which yielded 0.92.

Random sampling technique was adopted to select three universities based on ownership, i.e. federal, state and private in Kwara State. The three universities selected were Al-Hikmah University (Private), Kwara State University (State) and University of Ilorin (Federal). Samples were drawn from the Faculties of Physical Science, Natural Science and Education. Also, random sampling was used to select 100 respondents from all the three universities selected and 84 out of the 100 copies of distributed questionnaires were returned which translates to 84%. The responses were collated in preparation for statistical analysis. Research questions one and two was answered through descriptive statistics of frequency count and all other research questions were answered through research hypotheses which was analyzed using inferential statistics of t-test.

Results

Table 1:
Gender Distribution

Gender	Number	Percentage
Male	54	61%
Female	33	39%

Table 1 revealed the composition of gender of respondents. 61% of the respondents were male while 39% were female. It implies that majority of undergraduates studying Chemistry related courses are male.

Table 2:
Course of Study Distribution

Course of Study	**Number**	**Percentage**
Chemistry education	9	11%
Industrial chemistry	31	37%
Biochemistry	27	32%
Chemistry	17	20%

Table 2 revealed the composition of respondents by course of study. 11% of respondents were studying Chemistry Education, 37% were studying Industrial Chemistry, and 32% were studying Biochemistry while 20% were studying Chemistry. It implies that majority of the undergraduates were studying Industrial Chemistry as a course.

Table 3:
Year of Study Distribution

Year of Study	Number	Percentage
100 L	21	25%
200L	32	38%
300L	12	14%
400L	19	23%

Table 3 revealed the composition of respondents by year of study. 25% of respondents were 100L students, 38% were 200L students, 14% were 300L students while 23% were 400L students. It implies that majority of the undergraduates were in 200L while 300L students made up the lowest percentage of the respondents.

Research Question 1: How do undergraduates perceived the use of LMS for learning Chemistry concepts?

Table 4:
Measure of Undergraduates' Perception and Use of LMS Using Percentage Distribution

S/N	Statement	SD	D	UN	A	SA
1	Using LMS can make learning more easier	17.9	11.9	15.5	28.6	26.2
2	Using LMS can improve my academic performance	13.1	10.7	16.7	36.9	22.6
3	Using LMS can make understanding of a concept faster	8.3	11.9	25.0	44.0	10.7
4	Abstract concepts can be brought to reality with the use of LMS	9.5	17.9	26.2	28.6	17.9
5	Using LMS, I can freely interact with my course mates	6.0	20.2	20.2	28.6	25.0
6	Using LMS, I can freely interact with my instructor	3.6	17.9	19.0	45.2	14.3
7	Free interaction with my course mate make learning of chemistry concepts easier	15.5	10.7	20.2	34.5	19.0
8	Free interaction with my instructor make learning of chemistry concepts easier	13.1	11.9	8.3	35.7	31.0
9	Misconceptions on chemistry concepts can easily be corrected using LMS	11.9	6.0	29.8	35.7	16.7
10	Misconceptions on chemistry concepts can easily be corrected in traditional classroom set-up	8.3	19.0	22.6	26.2	23.8

Table 4, statement 1 showed that 46 respondents representing 54.8% agreed or strongly agreed that using LMS can make learning more easier as against 25 respondents representing 29.8% who disagreed or strongly disagreed, while 13 respondents were neutral and undecided to this statement. Statement 2 revealed that 50 respondents representing 59.5% agreed or strongly agreed to the notion that using LMS can improve their academic performance as against 20 respondents representing 23.8% who disagreed or strongly disagreed, while 14 respondents (16.7%) were undecided. Statement 3 shows that 38 respondents representing 45.2% agreed or strongly agreed that using LMS can make understanding of a concept faster while 17 respondents representing 20.2% disagreed or strongly disagreed on the statement and 21 respondents were undecided.

Statement 4 revealed that 39 respondents representing 46.4% agreed or strongly agreed that abstract concepts can be brought to reality with the use of LMS, 23 respondents representing 27.4% disagreed or strongly disagreed while 22 respondents (26.2%) were neutral. Statement 5 revealed that 45 respondents representing 53.6% agreed or strongly agreed that they can interact freely with their course mate using LMS, 22 respondents disagreed or strongly disagreed (26.1%) while 17 respondents (20.2%) were neutral on the statement. statement 6 showed that 50 respondents representing 59.5% agreed or strongly agreed that using LMS, they can freely interact their instructor as against 18 respondents representing 21.4% who disagreed or strongly disagreed, while 16 respondents were neutral and undecided to this statement. Statement 7 revealed that 45 respondents representing 53.6% agreed or strongly agreed to the notion that free interaction with their course mates makes learning of chemistry concepts easier as against 22 respondents representing 26.2% who disagreed or strongly disagreed, while 17 respondents (20.2%) were undecided.

Statement 8 shows that 56 respondents representing 66.7% agreed or strongly agreed that free interaction with their instructor makes learning of chemistry concepts easier while 21 respondents representing 25.0% disagreed or strongly disagreed on the statement and 7 respondents were undecided. Statement 9 revealed that 44 respondents representing 52.4% agreed or strongly agreed that misconceptions on chemistry concepts can easily be corrected using LMS , 15 respondents representing 17.9% disagreed or strongly disagreed while 25 respondents (29.8%) were neutral. Statement 10 revealed that 42 respondents representing 50.0% agreed or strongly agreed that misconceptions on chemistry concepts can be corrected easily through traditional classroom set-up, 23 respondents disagreed or strongly disagreed (27.4%) while 19 respondents (22.6%) were neutral on the statement. On the average, over 54.6% of the undergraduates were of the opinion that the use of LMS can ease learning of chemistry concepts, improve academic performance, create a free interacting atmosphere for both students and instructor and make the corrections of misconceptions in chemistry concepts easier.

Ho_1: There is no significant difference between gender and the perception of undergraduates on the use of LMS for learning chemistry concepts.
Table 5:
t-test Output on Gender Influence on Perception of Undergraduates on the Use of LMS for Learning Chemistry Concepts.

Group	N	Mean	SD	t-cal	Df	Sig (2tailed)	Decision
Gender	84	1.39	0.49				
				-17.9	83	0.00	Rejected
Perception	84	25.94	12.20				

P<0.05

The perception of undergraduates on the use of LMS for learning Chemistry concepts (N= 84) was influenced by gender, hence, there was a statistically significant difference between gender and perception, gender (M=1.39, SD = 0.49) and perception (M= 25.94, SD = 12.20), $t(83)$ = - 17.9, $p\leq$ .05, the 95% confidence intervals (95% CI), $CI._{95}$ = 21.82, 27.28 at 0.05 significance level. Therefore, the null hypothesis

is rejected. It then implies that there is significant difference in perception of undergraduates on the use of LMS based on gender. This is because the p-value (.00) is less than .05.

Ho$_2$: There is no significant difference between course of study and the perception of undergraduates on the use of LMS for learning chemistry concepts.

Table 6:

t-test Output on Course of Study Influence on Perception of Undergraduates on the Use of LMS for Learning Chemistry Concepts

Group	N	Mean	SD	t-val	Df	Sig (2tailed)	Decision
Course of Study	84	2.62	0.93				
				-16.3	83	0.00	Rejected
Perception	84	25.94	12.20				

P<0.05

The perception of undergraduates on the use of LMS for learning Chemistry concepts (N= 84) was influenced by course of study, hence, there was a statistically significant difference between course of study and perception, course of study (M=2.62, SD = 0.93) and perception (M= 25.94, SD = 12.20), $t(83)$ = - 16.3, $p \leq$ .05, the 95% confidence intervals (95% CI) , $CI._{95}$ = 20.48, 26.16 at 0.05 significance level. Therefore, the null hypothesis is rejected. It then implies that there is significant difference in perception of undergraduates on the use of LMS based on course of study. This is because the p-value (.00) is less than .05.

Ho$_3$: There is no significant difference between year of study and the perception of undergraduates on the use of LMS for learning chemistry concepts.

Table 7:

t-test Output on Year of Study Influence on Perception of Undergraduates on the Use of LMS for Learning Chemistry Concepts

Group	N	Mean	SD	t-val	Df	Sig (2tailed)	Decision
Year of Study	84	2.35	1.09				
				-16.4	83	0.00	Rejected
Perception	84	25.94	12.20				

P<0.05

The perception of undergraduates on the use of LMS for learning Chemistry concepts (N= 84) was influenced by year of study, hence, there was a statistically significant difference between year of study and perception, year of study (M=2.35, SD = 1.09) and perception (M= 25.94, SD = 12.20), $t(83)$ = - 16.4, $p \leq$ .05, the 95% confidence intervals (95% CI) , $CI._{95}$ = 20.73, 26.46 at 0.05 significance level. Therefore, the null hypothesis is rejected. It then implies that there is significant difference in perception of undergraduates on the use of LMS based on course of study. This is because the p-value (.00) is less than .05.

Discussion

The study examines the opinion and factors that influence the perception of undergraduates on the use of LMS for learning Chemistry concepts. It was found that good percentage of the undergraduates have positive perception towards the use of LMS for learning Chemistry concepts. Most of the students are of the opinion that using LMS can make learning more easier, understanding of concepts faster and improve their academic performance. This finding is in line with Omotunde(2015) who opines that pre-service teachers have positive perceptions to the integration of LMS into instructions. Also, Dahlstro, Brooks and Bichsel (2014) affirmed that lecturers and students perceived the available LMS as augmenting pedagogical and learning experiences respectively.

Among the challenges of studying chemistry as a course are the abstract nature of the course and misconception of basic concepts by students, these challenges are also believed to be overcome with the use of LMS as the platform provides opportunity for free interaction among the students and the lecturers.

It was also found out that gender, course of study and year of study are factors that influence the perception of undergraduates on the use of LMS since there was a statistically significant difference between these three factors and perception of the students on the use of LMS for learning chemistry concepts. This finding is in line with the finding of Claar, Dias and Shields (2014). It was asserted from the study that the higher the educational level, the more likely new LMS systems will be accepted and utilized. Furthermore, Omotunde (2015) corroborates this finding as it was reported that gender and course of study influence the use of LMS for learning. In conclusion, students were reported to perceive Learning Management System (LMS) as beneficial, and are quick to complement the shortcomings of the system by adopting other systems to fulfill educational needs.

Conclusion

The undergraduates perceived Learning Management Systems as a tool that is beneficial towards learning Chemistry in order to alleviate certain challenges of grasping and understanding the basic and fundamental content of the concepts. Gender, course of study and year of study influence the perception on the use of LMS for learning Chemistry concepts.

Recommendations

Based on the findings of the research, the following recommendations are suggested:
1. Undergraduates' positive perception of Learning Management System for learning Chemistry concepts should be explored by the course lecturers.
2. Undergraduates' use of LMS for learning Chemistry concepts should be employed by course lecturers to give assignment and collaborative task.
3. Gender should always be given attention when employing the use of LMS to learn Chemistry concepts.
4. The nature of the content with regard to course of study should be considered when employing LMS for learning Chemistry concepts.
5. The maturity of students in term of year of study should guide the use of LMS for learning Chemistry concepts.

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