



Students' Perception on using e-Learning Resources as Educational Support Material: A Case study

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Abstract— Blended learning is regarded as an effective and low risk strategy which help universities to gradually transform the study programs with the latest technological developments. This study attempts to analyze user perception and requirements of e-learning as part of an ongoing research to develop e-Learning material for a Moodle based e-Learning Management System (ELMS). Student community of an agriculture higher education institution was selected as the study community. A questionnaire survey was used to gather data from a study sample of 182 undergraduates from a selected higher education institution. Data were analyzed using descriptive methods. According to the findings, electronic learning resources were more popular among students when compared to library material. Majority of the students used their personal devices such as mobile phones and laptop computers to access the ELMS. The students preferred to use electronic learning resources and suggested producing more interactive learning materials such as video lectures, which they can use for self-studying.

Keywords— Blended learning, Students' Perception, Higher Education, Moodle

I. INTRODUCTION

Higher education institutions have been challenged to meet the growing expectations of prospective students for high quality learning experiences and outcomes, which are in par with the demands for connectivity. The present ICTs have transformed many sectors including the higher education, creating high demand for technologically enhanced learning situations. It is necessary to design and implement study programs that can harness the best uses of ICTs to facilitate meaningful learning experiences for the student population. 'Blended learning combines multiple delivery media that are designed to complement each other and promote learning and application of learned behavior' [1]. Blended learning is seen as effective and low risk strategy which help universities to gradually transform the study programs with the latest technological developments. It is further suggested that blended learning should combine properties of both face-to-face and online learning to go beyond the capabilities of both separately [2]. It is widely established that blended learning approaches have the potential to enhance both the effectiveness and efficiency of meaningful learning experiences [3]. Face to face learning environments that are supported with well-crafted online interactive modules have empowered students to take control over their learning process, while creating positive learning impacts [4].

Implementation of blended learning at institution level

is being confronted due to lack of good quality supplementary-online learning material that are developed by experts in relevant subject domains. Especially in the higher education sector, developing course related e-learning modules still remains a challenge [5]. The common practice among the academic is to find suitable online learning resources from the worldwide web and guide students to follow these material as supplementary learning material. Such free online e-learning resources that are matching with learning outcomes, and of good quality and high educational value should never be underestimated, nevertheless it is necessary to develop course specific online learning contents by teachers due to several reasons. For instance, e-learning material used in undergraduate studies need to be supported by adequate pedagogies that are related to the learning outcomes of the given degree program. Further, when designing e-learning material, it is necessary to consider user characteristics such as motivation, familiarity with technology and access to technology, for the given learning community and designs need to be informed by these characteristics. Further, the developers should consider the user expectations of the specific study community.

Agriculture sciences at the higher education level is an applied science field that is build up on basic sciences. The current degree programs are relying of vast array of disciplines such as biology, crops science, food science, soil science, agricultural engineering, agricultural economics and agricultural extension. The learning program is designed to help students to develop cross disciplinary knowledge. This makes the development of e-learning material a challenging task.

Accordingly this study was conducted to assess user characteristics and user requirements as a baseline which can then be used to inform pedagogical designs of course specific e-learning contents in the field of agriculture education. The study community is using a Moodle based ELMS at present with course related e-learning support material that were uploaded by the teachers. The findings of this study will be subsequently used in designing supplementary learning resources for a Moodle based ELMS. The specific objectives of the study were to: i. Explain present uses of electronic learning resources among students ii. Describe the familiarity with different activities and resources available in the ELMS, iii. Identify the most commonly used devices when accessing the e-



learning management system (ELMS), and iv. Analyze student perception and attitudes towards blended learning.

II. THEORETICAL BACKGROUND

Blended learning (BL) can be commonly referred to as the use of information technologies together with traditional face-to-face learning environments. BL is viewed as a 'pedagogical approach which allows learners to customize their learning by using synchronous and asynchronous delivery modes, increasing the level of interaction among learners and instructors' [6]. Designing BL environments had favorable effects on student learning when compare to traditional Face-to-face learning deliveries. Studies reported that students in online learning conditions performed modestly better than those receiving face-to-face instruction [7]. Furthermore, students in blended courses reported to have learnt more when compared to a comparable traditional class sections. Teachers responsible for the blended sections report that students write better papers, performed better on exams, produced higher quality projects, and were capable of more meaningful discussions on course material [6]. Further BL programs can include the possibility of offering learners additional, carefully designed, and varied learning materials, available at any time and place (flexibility feature) with the aim of enhancing their learning practices and achieving specific learning objectives through the support of a medium [6]. Other benefits of BL includes its ability to cater for different learning styles and needs [8], providing a unique and flexible learning experiences, because students could access and engage with their educational program from anywhere and at any time [7]. Web-based learning environment has been evaluated as convenient and accessible for students while promoted autonomy of learning and positive interactions between peers. BL has further enhanced engagement of learning and the overall learning experience [9]. Students favored web-based online learning environment as effective but they did not want to give up from face to face component of the course. This is one of the rationales of blended learning approach that advocates benefiting from advantages of both online and face to face learning environments [10].

ADDIE model remains as one of the most commonly used, widely accepted and effective tools in instructional design. ADDIE stands for Analyze, Design, Develop, Implement and Evaluate. Application of ADDIE in designing e-learning environments facilitates the development of student-centered and authentic learning experiences [11]. Common procedures when following ADDIE includes confirm with the intended audience, validating performance gaps and determining potential delivery systems. The audience analysis, which remains an important concern when adopting ADDIE, involves of studying the general characteristics of users, user knowledge, experience, attitudes, and basic skills that impact potential to succeed in the learning environment.

Moodle based course management systems have gained wide acceptance among academic institutions due to benefits such as flexibility, open source and free nature [12]. It is most commonly used in offering distance learning and blended learning. Moodle has a variety of resources and activities when it comes to facilitating blended learning; such as forums, wikis, questionnaires, lessons, assignments, quiz etc.

III. METHOD

This study was conducted to analyzed students' perceptions of the use of the ELMS to deliver the course in blended learning paradigm

Study population consisted of 848 students from an agriculture higher education institute, which offered three degree programs. About 182 students were selected following stratified random sampling method. Stratification was based on the degree program, academic year and gender. Data were collected using a pre-tested questionnaire. Students' attitudes were measured using a five point Likert scale. Prior to the data collection, students consent was obtained. The participants were informed about the purpose of study and agreed to assure the confidentiality of data. Data were analyzed using IBM SPSS Statistics 19, using descriptive methods.

IV. RESULTS AND DISCUSSION

A. Background information:

Age of the respondents ranged from 20 -37. Majority (71%) of the respondents were 22- 24 years old. A few (4%) were above 30 years old. Majority (68%) of the respondents were females. Almost all the students were familiar with using computers for their studies. Each student had undergone a basic ICT training during the first academic semester and also registered in the ELMS during the first semester. Majority (71%) of students mentioned that they accessed internet 1-2 hours every day. The usage of internet was for both academic purposes and use of social media. Majority of the students regularly visited the ELMS. About (4%) visited the e-hub daily, while 43% visited 2-3 times per week, and 25% visited once a week.

B. Commonly used learning resources

Most commonly used learning resources were websites (67%), and teaching material that were uploaded to the ELMS by the teachers (54%) (Fig. 1). These teaching material included mostly the PowerPoint slides that were used during face-to-face discussions, handouts prepared for class discussions, journal papers and other reference documents. In addition, many students searched for educational videos posted on YouTube (41%) as learning support material. Use of text books (39%), and online research journals (30%) were somewhat limited. Overall, students were more interested in using electronic learning resources when compared to the text books, mainly due to convenience and accessibility. Fig. 1 shows the distribution of students based on their choices of learning resources.

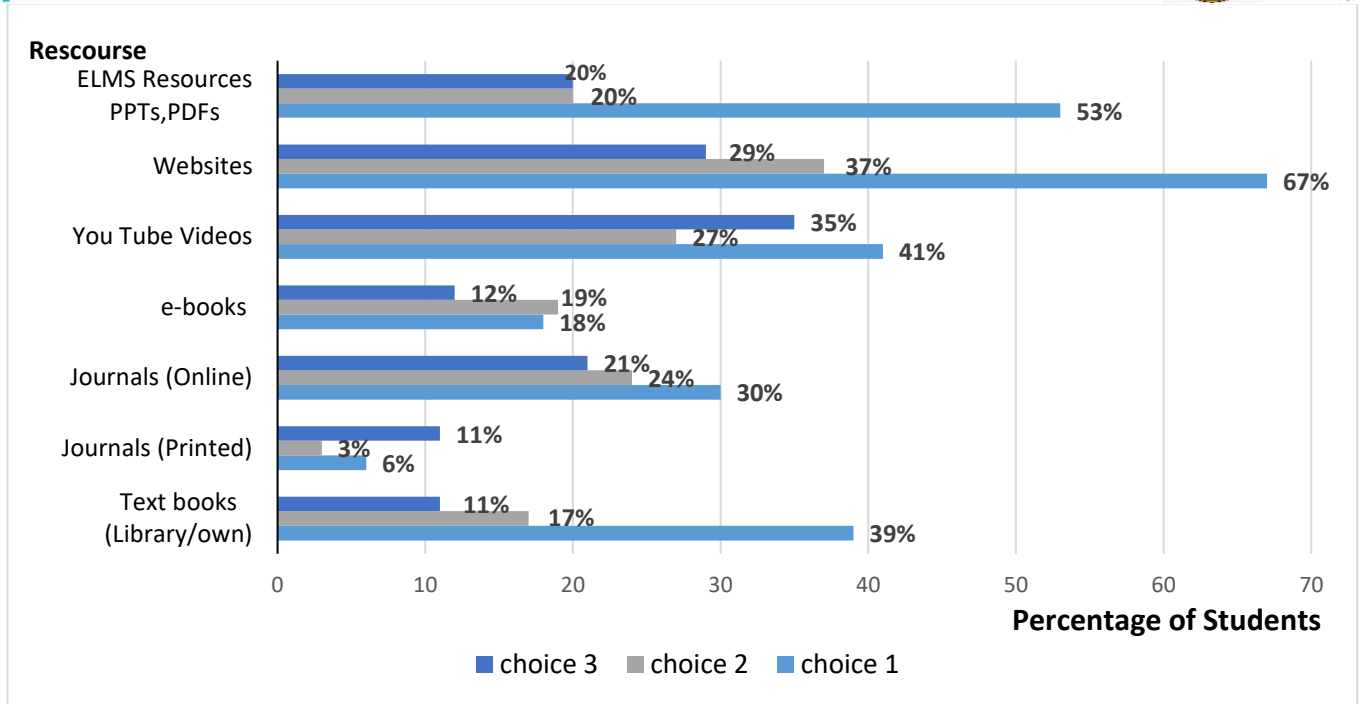


Fig. 1 Student preference for learning support material

C. Familiarity with ELMS based activities and resources

Majority of the student community were regular users of ELMS. About (4%) visited the ELMS every day, while 43% visited 2-3 times per week, and 26% visited once a week. The rest of the user community visited only when they get a notifications related to ELMS activities (10%) or when the lecturers informed them to do so (19%) during a face-to-face discussion.

Moodle based ELMSs can offer a variety of learning opportunities for its users. The present ELMS, which is operated on Moodle version 3.2.2+ offers 15 learning activities and 7 learning resources. Most common uses of the ELMS by the students included downloading teaching material such as PowerPoint presentation slides (95%), Handouts (77%), uploading assignments (85%), and attempting quizzes (77%). Only a minority of students had experiences in using glossaries (11%), developing and using wikis (9%), completing survey questionnaire (8%), completing feedback survey (5%), participating in discussion forums (4%), creating databases (3%), participating in workshops (2%) and in chat sessions (1%). This indicates that students mainly used the ELMS to download learning support material, and to upload assignments. Their familiarity with interactive learning experiences such as building and using wikis, workshops and chat sessions seems to be somewhat limited. One possible explanation for the limited use of interactive learning resources available in Moodle might be the less integration of such activities to the e-learning modules by the teachers. Teacher expertise is considered as an important consideration when implementing ELMS based interactive learning contents [13].

D. Devices used to access the eLMS

The student community used a variety of devices to access the ELMS namely desktop computers, laptops, mobile phones, and tablet computers. They used common IT facilities such as the Computer Center of the institution as well as personal devices when accessing the ELMS (Fig. 2). Mobile phones (55%) and laptops (39%) were the most frequently used devices to access the ELMS, both of which were personal devices. The cost associated with internet based data was seen as one of the major concerns when using personal devices to access the ELMS. Less than one third of the students (29%) have used the common IT facilities available in the Computer Unit.

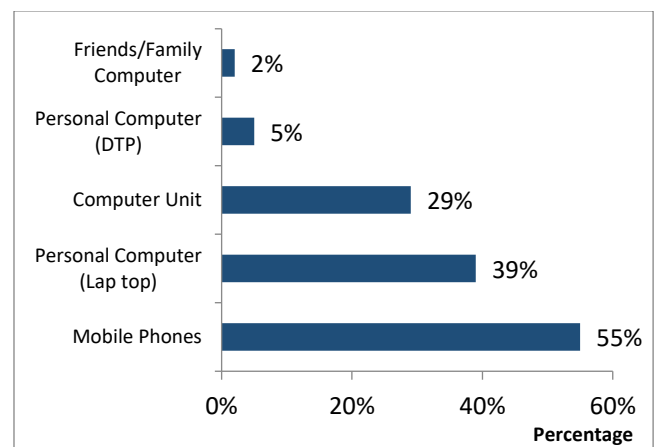


Fig. 2 Distribution of respondents by the devices used by the users to access the eLMS

It is necessary to consider the devices on which the students access e-learning resources in order to make informed design choices. Some of the critical problems with



smartphones that need to be considered when designing e-learning is the download speed, small screen sizes with poor resolution, limited memory etc. [14]. About 30% of the students used more than one device which allowed them to access the ELMS whenever they need. One of the limitations

E. Student perception on eLearning

Student perceptions and attitudes were studied as part of the e-learning requirement analysis (Table 1). More than half (58%) of the respondents preferred to submit assignments online than as a printed copy. However 22% of the respondents disagreed. About 33% of the students mentioned that they are not confident in facing online examinations. Both these findings suggest that students need more training and exposure to use the ELMS and to face ELMS based exams. More than one third (35%) of the students mentioned that they enjoyed participating in ELMS based forum discussions. The rest of the respondents either disagreed (22%) or stated as neutral (43%). Majority (77%) of the respondents preferred to have

video based e-learning resources when compared to PowerPoint slides or other printable material. Interactive video that provides autonomy with random access to contents have resulted better learning outcomes and increased students' satisfaction when compared to non-interactive videos [15]. Multimedia based learning contents found to be providing more engaging and enjoyable learning experiences. However, finding relevant educational videos that match with course content and syllabus can be difficult task for the instructors [5]. More than half the students (58%) preferred to have online self-learning resources as suggested by the instructors. Overall the students were both satisfied (73%) and enjoyed (77%) the learning experience gained through the ELMS.

TABLE I. STUDENT PERCEPTION AND ATTITUDES TOWARDS BLENDED LEARNING

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I prefer online submission of assignments than in a printed format	53 (29%)	53 (29%)	35 (19%)	30 (17%)	9 (5%)
I enjoy participating in online tests /quizzes	28 (16%)	60 (33%)	55 (31%)	17 (9%)	20 (11%)
I'm not very confident in facing online exams	17 (10%)	34 (19%)	67 (38%)	36 (20%)	22 (13%)
I enjoyed participating in forum discussions	17 (10%)	41 (25%)	71 (43%)	27 (16%)	10 (6%)
I think the students will ask more questions from the instructors during an online discussion than in a traditional face-to-face class session	33 (19%)	60 (40%)	52 (29%)	22 (12%)	11 (6%)
I prefer to use educational videos when compare to other teaching aids such as PPT slides	70 (39%)	68 (38%)	31 (17%)	6 (3%)	5 (3%)
I prefer using electronic learning resources than printed material during the independent learning hours	40 (22%)	66 (36%)	46 (25%)	19 (10%)	0 (0%)
I prefer educational videos as learning support material when compared to text books	40 (22%)	66 (36%)	46 (25%)	19 (10%)	11 (6.0%)
I prefer face-to-face lectures and discussions than using ELMS based learning activities	85 (47%)	57 (31%)	25 (14%)	13 (7%)	2 (1%)
I enjoyed using the course material on the ELMS	43 (24%)	57 (23%)	25 (31%)	13 (7%)	13 (7%)
The ELMS stimulated my desire to learn	29 (16%)	104 (59%)	36 (20%)	4 (2%)	4 (2%)
I am satisfied with the ELMS with regard to the quantity of my learning experience	14 (8%)	100 (56%)	48 (27%)	13 (7%)	3 (2%)
I am satisfied with the ELMS with regard to the quality of my learning experience	18 (10%)	98 (55%)	45 (25%)	14 (8%)	3 (2%)

Student showed a clear interest to use interactive learning experiences through the ELMS. They suggested including more quizzes, discussions and instructor-led chat sessions. Majority (53%) agreed that students will ask more questions in an online learning environment when compared to traditional F2F classroom based learning. One possible reason for this could be the large number of students attending a lecture which includes more than 150 students per class. Students had favorable attitudes towards blended learning experiences. Majority of the students find

e-learning as an enjoyable experience (77%) which stimulated their desire for learning (75%). However there was a minority who had un-favorable or poor attitudes towards e-learning. In future, it is necessary to study the reasons behind the poor attitudes and offer necessary support to these students to use the E-learning resources effectively. Some students suggested improving the usability of the ELMS by adding student grades, notices, educational videos, and to include more learning resources. Furthermore, the students suggested to increase the number



of interactive learning sessions through the ELMS such as forum discussions and chat sessions facilitated by teachers.

Student perception on e-learning usage did not show any association with gender or academic performances. Both male and female students had similar perceptions related to the use of e-learning resources available in the ELMS. This was similar to the findings reported in [13] that technology adoption and usage was not affected by gender of the respondent.

V. CONCLUSIONS AND RECOMMENDATIONS

The present Moodle based ELMS effectively caters to some of the essential needs of the study program such as distribution of course related support material, submission of assignments and conduct quizzes. The student community access the ELMS mostly for the above purposes and they are satisfied with the quality of learning experience. The activities that can be used to facilitate interactive learning however, are not being fully utilized. Lack of integration of interactive formats to the eLearning modules could be due to lack of ICT skills among the instructors. It is necessary to provide adequate training and support to the course instructors to effectively integrate interactive learning activities to the ELMS. The user community had favorable attitudes towards e-learning, and were willing to try interactive learning activities available in the Moodle such as chat sessions, discussion forums, and quizzes. They further highlighted the need of including educational videos in the ELMS. Use of educational videos will be useful in delivering contents related to the practical training programs offered in the field of agriculture. Especially, the teaching staff can create video based contents based on the field practical classes and industry visits in addition to the regular practical classes.

Design of interactive learning contents, especially the video based e-learning resources, need to be informed with the devices used by the student community in accessing the ELMS. Since the majority is using their personal mobile phones and laptops to access the ELMS, it is necessary that the video contents be of shorter duration and reduced file size for easy access.

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