# Assessing Students' Satisfaction on the Use of Virtual Learning Environment (VLE): An Input to a Campus-wide E-learning Design and Implementation

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**Abstract**
Educational institutions have come to realize the potential benefits of using Virtual Learning Environment (VLE). When used correctly, VLE may transform learning experience of students into a more enjoyable, satisfying and effective setting. This paper evaluated students' satisfaction on the use of VLE as a support technology in teaching students in the Graduate School. Procedures involved in the study include installation of a Modular Object-Oriented Dynamic Learning Environment (MOODLE) package, customizing the VLE and determining the students' satisfaction. The instrument used for data collection was the developed online questionnaire. A total of 67 Master of Business Administration (MBA) students of Batangas State University (BatStateU) enrolled in the course Management Control and Information System (MCIS) for the period of 2011-2013 served as the respondents of this study. The VLE is found to be effective as a supportive tool to supplement traditional classroom instruction as revealed by satisfied students. Positive attitude is exhibited on the use of VLE regardless of gender. On the other hand, young and experienced users of e-learning platforms tend to be difficult to satisfy with regards to the use of VLE.
**Keywords:** e-learning, virtual learning environment, satisfaction

## 1. Introduction

Information Technology (IT) has revolutionized the field of education. Delivery of courses becomes more convenient through the use of the Web. This practice is termed as e-learning. Al-Bashir (2010) defined e-learning as the use of technological tools to develop, disseminate and retrieve digital content via a computer so as to improve learning. Technological tools comprise the world wide web (www), local intranet/extranet, CD/DVD, TV and even mobile devices. One of the features of e-learning is flexibility which means it can be implemented in various ways. Implementation of e-learning can be computer-based, computer-supported collaborative, synchronous and asynchronous modes. Using any of these modes will make student in control of his own learning progress.

E-learning when combined with traditional face-to-face instruction offers significant experience on the part of both faculty and students. Grey (2006) stated that blended learning fuses e-learning with other delivery techniques to come up with an excellent learning experience. Moreover, Zafra *et al.* (2011) concluded in their study that blended e-learning approach can be used effectively and efficiently to facilitate learning and to improve the students' motivation and performance. The said authors believe that e-learning when combined with traditional instruction delivery poses meaningful returns in an educational institution.

### E-learning in Batangas State University (BatStateU)

BatStateU is authorized to adopt e-learning as stipulated in its charter under Section 7.u of RA 9045 which says that, one of the specific powers of the Board is: "To set up the adoption of modern and innovative modes of transmitting knowledge, such as the use of IT, the dual system, open-learning, community laboratory, etc., for the promotion of greater access to higher education." Similarly, the Commission on Higher Education (CHED) recognizes e-learning as one of the alternative ways of delivering education (CMO No. 40 series of 2008). In these settings, the BatStateU together with other universities and colleges in the country are now seen venturing on this kind of technology.

At present, e-learning in BatStateU is in its early stage of implementation. Santy and Smith (2007) highlighted that e-learning techniques can be implemented using an institutional VLE or more likely, the Internet to enhance knowledge, skills and performance of learners. Knowing the advantages of e-learning, the authors have conceptualized a VLE, designed primarily to support the traditional face-to-face instruction in the Graduate School. This is done by adopting the popular e-learning platform called MOODLE which is an open-source

software that can be downloaded, deployed and used without a cost. This software offers numerous activity modules such as assignments, forums, blogs, quizzes to name a few. Burgess (2008) described MOODLE as a tool which provides a solid platform in the development and implementation of a teaching and learning strategy. Likewise, Sumak *et al.* (2011) highlighted that MOODLE can be used as a tool for delivering course content to students, learning assessment using assignments or quizzes and building rich collaborative learning communities.

At BatStateU, selected graduate students are given the tasks to utilize VLE in downloading course lectures, writing blogs, connecting with professors and classmates through a built-in chat system, answering quizzes and uploading assignments. On the other hand, professors use the VLE to administer course learning materials, check the uploaded students' assignment, prepare quizzes, create course content, post announcement, and the likes.

As in any undertakings, it is important to evaluate the system. The purpose is to achieve a more effective teaching and learning environment. Many studies offer concepts on how to evaluate the success of e-learning. Chen (2003) believed that satisfaction is a measure of pleasure and contentment. Correspondingly, Roca *et al.* (2006) considered satisfaction as an important determinant in measuring information systems' success and use. Furthermore, Riel *et al.* (2001) found out that satisfaction has a strong impact on intention to continue using a portal site.

There are several studies in line with e-learning design and implementation at BatStateU. However, none of them directly addresses the satisfaction level of students who used this technology. In this regard, the authors find it imperative to conduct an analysis about the level of satisfaction of students on the use of VLE. Moreover, insights that will be revealed may serve as inputs for educational institutions in planning, designing and implementing e-learning programs. Furthermore, it is hoped that upon verifying the VLE users' satisfaction and effectiveness, this will be institutionalized in all the other courses in the University.


## 2. Methodology

Procedures involved in the study include installation of a MOODLE package; customizing the VLE; and determining the students' satisfaction. To develop the VLE, a MOODLE package was installed in a Linux machine with working server running Apache, MySQL database and a number of Perl Hypertext Preprocessor (PHP) extensions. Prior to installation, the MOODLE package was downloaded from http://moodle.org/downloads. A new empty database and user/password combination with appropriate permission was created using MySQL. In addition, an empty directory was created to hold the MOODLE files. Installation of the MOODLE code, configuration and actual installation of the package followed. Lastly, a cron job was setup to run periodically.

The VLE powered by the MOODLE platform is intended initially to supplement face-to-face teaching in graduate school classes. This can be accessed at http://vle.batstate-u.edu.ph. Figure 1 shows the homepage of the BaStateU VLE.
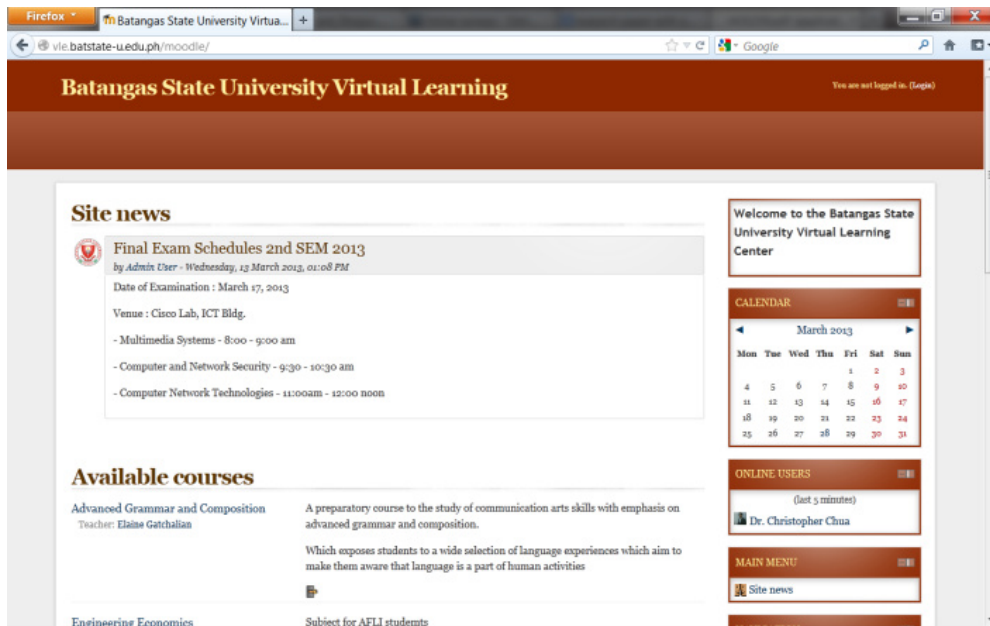
**Figure 1 – BatStateU VLE Home Page**

There are 12 graduate courses and three undergraduate courses listed in the VLE. For the purpose of this research, only the course Management Control and Information System (MCIS) was selected to be evaluated. MCIS is one of the major courses under the Master in Business Administration (MBA) program of the University. Figure 2 illustrates the course MCIS page.



**Figure 2 – The Course MCIS page**

The course MCIS includes nine PowerPoint presentations, five case studies, two assignments, four lessons in PDF and course syllabus. A total of 67 students were enrolled in the said course for the period 2011-2013. Students were instructed to create their own account in the VLE for them to have access to its numerous features and contents. The VLE presented here is just a supportive tool and so, the professor saw to it that he meets the class regularly on scheduled date and time at the designated classroom.

To verify the satisfaction of the students using the VLE, a questionnaire was developed. The said questionnaire is a product of readings of several literatures (Sumak *et al.* 2011, Al-Khalifa 2008, Zafra *et al.* 2011, Bell & Farrier 2008) in line with e-learning evaluation. Preliminary items in the questionnaire determine the age, gender and previous e-learning experience of users. Items on user's satisfaction are grouped in terms of Learner Interface (7), Learning Community (4), Content (7) and Usefulness (5). Faculty members who have experience in e-learning were requested to examine the first draft of questionnaire in terms of its relevance and clarity.

The second draft of questionnaire was fielded to 20 faculty members as try-out to validate its reliability. Data collected from the try-out was analyzed using Statistical Package for Social Sciences (SPSS). All measurement items were found to be valid and reliable. The finalized questionnaire was posted in the VLE.

Respondents of the study were the 67 students enrolled in the course MCIS for the period 2011-2013. They were asked to provide their feedback on each statement of the questionnaire in which they can express their agreement or disagreement with use of a 4-point scale. Evaluation was done at the end of each semester. Data gathered were analyzed and subjected to statistical analysis using SPSS.

## 3. Results and Discussion
### *Demographic Variables (Age, Gender and Experience)*
Table 1 shows the demographics of the respondents of the study. As seen in Table 1, majority of the respondents ranges from ages 28 and above (56.72%). This somewhat confirms the idea of Bloom (1981) who mentioned that graduate students are older, more mature and brighter. As for gender, female respondents (67.2%) dominated male respondents (32.8%). This contradicts what was mentioned in the website of Australian Institute of Business that fewer women than men seek an MBA degree. In terms of experience, most of the respondents have no previous experience in using any e-learning platforms (85.1%). This means that a Learning Management System (LMS) like MOODLE is not yet instituted in their colleges during their undergraduate stint.

### Table 1 – Demographics of Respondents (N=67)

| Variables | Frequency | Percentage |
|---|---|---|
| **Age** | | |
| 27 & below | 29 | 43.3 |
| 28 & above | 38 | 56.7 |
| **Gender** | | |
| Male | 22 | 32.8 |
| Female | 45 | 67.2 |
| **Prior VLE Experience** | | |
| No experience | 57 | 85.1 |
| With experience | 10 | 14.9 |

### *Students' Satisfaction*

Table 2 shows the summarized replies of the respondents regarding their satisfaction on the use of VLE as a supportive tool in teaching. As shown in Table 2, almost all statements are agreed and three statements are strongly agreed by the respondents. Under the dimension of learner interface, statements obtained weighted means range from 3.04 to 3.27. This shows that respondents are satisfied with the overall design of the VLE. The finding shows similarity in the study of Al-Khalifa (2010) wherein their installed LMS was also enjoyed and found easy to use by the students resulting to increase confidence in the use of technology.

**Table 2 – Students' Satisfaction on the Use of VLE**

| Statements | Weighted Mean | Verbal Interpretation |
|---|---|---|
| *Learner Interface* | | |
| 1. I like the look and feel of the VLE. | 3.04 | Agree |
| 2. Colors, background and layout are appropriate. | 3.19 | Agree |
| 3. Buttons and links are well-placed. | 3.15 | Agree |
| 4. Fonts (style, color, saturation) are easy to read. | 3.10 | Agree |
| 5. The VLE is easy to navigate. | 3.09 | Agree |
| 6. The VLE is user-friendly. | 3.22 | Agree |
| 7. I am satisfied with the interface of the VLE. | 3.27 | Agree |
| *Learning Community* | | |
| 8. The VLE makes it easy for you to discuss questions with | 2.55 | Agree |
| 9. The VLE makes it easy for you to access the shared | 2.61 | Agree |
| 10. The VLE makes it easy for you to discuss questions with | 2.85 | Agree |
| 11. The VLE system makes it easy for you to share what you | 2.57 | Agree |
| *Content* | | |
| 12. The VLE provides up-to-date content. | 3.04 | Agree |
| 13. The VLE provides content that exactly fits your needs. | 3.12 | Agree |
| 14. The VLE provides sufficient content. | 3.19 | Agree |
| 15. The VLE is appropriate and is presented in a structured | 3.22 | Agree |
| 16. The VLE is simple and understandable. | 3.51 | Agree |
| 17. The duration of the VLE is just right. | 3.19 | Agree |
| 18. I am satisfied with the content of VLE. | 3.31 | Agree |
| *Usefulness* | | |
| 19. The VLE can improve students' performance. | 3.54 | Strongly Agree |
| 20. The VLE can enable students' to accomplish tasks more | 3.48 | Agree |
| 21. The VLE can improve teaching. | 3.40 | Strongly Agree |
| 22. The VLE can make assignments/tasks easily done. | 3.46 | Agree |
| 23. The VLE is useful in my course. | 3.57 | Strongly Agree |
| **Overall Weighted Mean** | **3.16** | **Agree** |

As for learning community, weighted means range from 2.55 to 2.85 which denotes the lowest responses among all statements. This suggests that there is a need to create more activities under this dimension. The result is parallel to the study of Liaw (2008) wherein the learners indicated that they needed more interactive and communicative functions and activities in the developed Blackboard system. Zafra *et al.* (2011) proposed communicative/collaborative activities, namely, news, doubt and forums about units of subject as well as interactive activities for problems, projects and quizzes. Though respondents agreed in the statements under the learning community dimension, mentioned interactive and collaborative activities can be integrated in the VLE to further enhance its features.

Under the content dimension, average responses span from 3.04 to 3.22. This reveals that respondents are satisfied with the content of the VLE. This is because, the VLE offers effective course management. In addition, this enables learners to feel more comfortable with the course content, resulting in higher retention and satisfaction rates as stressed by Ozkan and Koseler (2009).

As per usefulness, weighted means range from 2.46 to 3.57. This indicates that respondents believe that the VLE is useful in their course. Correspondingly, this perceived usefulness and satisfaction both contribute to the learners' behavioral intention to use the e-learning system as cited by Liaw (2008) and Sumak *et al.* (2011).

In general, the overall weighted mean 3.16 is interpreted that respondents are satisfied using the VLE. Cheng (2011) claimed that satisfaction with e-learning has positive effects on perceptions of its behavioral and output effects. In this theme, it can be inferred that the VLE is effective in improving performance (behavioral and output) of the respondents.

### Significant difference by Age

Table 2 illustrates the comparison by age of the respondents.

**Table 2 – Comparing the Age**

| Dimensions | 27 & below (n=29) | | 28 & above (n=38) | | T | Sig. (2-tailed) |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | | |
| Learner Interface | 3.21 | 0.28 | 3.11 | 0.31 | 1.293 | 0.201 |
| Learning Community | 2.36 | 0.46 | 2.86 | 0.35 | -5.065 | 0.000004 |
| Content | 3.24 | 0.30 | 3.22 | 0.32 | 0.191 | 0.849 |
| Usefulness | 3.56 | 0.39 | 3.44 | 0.41 | 1.22 | 0.227 |

*degrees of freedom: 65*
*level of confidence: 95%*

As seen in Table 2, only the dimension learning community shows a significant difference in the scores for 27 & below group (M=2.36, SD=0.46) and 28 & above group (M=2.86, SD=0.35) conditions; $t(65)=-5.065$, $p=0.000004$, $\alpha = 0.05$. These results imply that the age of respondents has an effect on satisfaction. Specifically, the findings suggest that older respondents tend to be easier to be satisfied compared to younger ages with regard to the learning community dimension of the VLE. Wu *et al.* (2008) recommended that instructors should motivate the positive interaction publicly to encourage collaborative learning interaction via the system.

### Significant difference by Gender

Table 3 shows the comparative result of the male and female respondents along the four areas of the VLE.

**Table 3 – Comparing the Gender**

| Dimensions | Male (n=22) | | Female (n=45) | | T | Sig. (2-tailed) |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | | |
| Learner Interface | 3.13 | 0.32 | 3.17 | 0.29 | -0.453 | 0.652 |
| Learning Community | 2.56 | 0.48 | 2.69 | 0.46 | -1.084 | 0.282 |
| Content | 3.13 | 0.36 | 3.28 | 0.27 | -1.856 | 0.068 |
| Usefulness | 3.47 | 0.41 | 3.5 | 0.41 | -0.235 | 0.815 |

*degrees of freedom: 65*
*level of confidence: 95%*

As revealed in Table 3, there was no significant difference between the scores of male and female respondents in all dimensions. These findings do not support the study of Gomez (2012) in which he revealed that female students are more satisfied than male students with e-learning. On the other hand, the result is analogous to the studies of Cheng (2011) and Majeed (2011) in which e-learning satisfaction between male and female respondents did not have significant difference.

### Significant difference by Experience

Table 4 reveals the comparison of no experience and with experience respondents on the use of any e-learning platforms.

**Table 4 – Comparing the Experience**

| Dimensions | No experience (n=29) | | With experience (n=38) | | T | Sig. (2-tailed) |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | | |
| Learner Interface | 3.16 | 0.29 | 3.11 | 0.34 | 0.451 | 0.654 |
| Learning Community | 2.75 | 0.39 | 2.03 | 0.42 | 5.43 | 0.0000009 |
| Content | 3.25 | 0.28 | 3.13 | 0.44 | 1.108 | 0.272 |
| Usefulness | 3.51 | 0.40 | 3.11 | 0.46 | 2.799 | 0.007 |

*degrees of freedom: 65*
*level of confidence: 95%*

As depicted in Table 4, two dimensions, namely, learning community and usefulness show significant results. As per learning community, there was a significant difference in the scores for no experience group (M=2.75, SD=0.39) and with experience group (M=2.03, SD=0.42) conditions; t(65)=5.43, p=0.0000009, $\alpha$ = 0.05. These findings suggest that prior experience in any e-learning platforms affects the satisfaction of users. Specifically, users with experience in any e-learning packages tend to be harder to satisfy compared to users with no experience. This is because they have already tried other e-learning platforms resulting to familiarization on several activities and features under the learning community dimension.

As per Usefulness, there was a significant difference in the scores for no experience group (M=3.51, SD=0.40) and with experience group (M=3.11, SD=0.46) conditions; t(65)=2.799, p=0.007, $\alpha$ = 0.05. These results suggest that prior experience in any e-learning platforms has an effect on the satisfaction of users with regards to the usefulness of the system. In detail, users with experience in any e-learning packages tend to be difficult to please compared to users with no experience. This is due to the fact that they are already aware of other platforms with significant activities and features related to usefulness of the system. A parallel result can be seen in the study of Malika (2010) wherein he cited that knowledge of using computers significantly affects learner satisfaction. Findings suggest that there should be incorporation of new activities and features on the design and implementation of VLE when the audiences are experienced users.

## 4. Conclusion

This paper concluded that the VLE is effective as a supportive tool to traditional classroom instruction as revealed by satisfied students. Both male and female respondents have shown positive attitude on the use of VLE. Young and experienced users of e-learning platforms tend to be difficult to satisfy and expect new features and activities with regard to this technology.

The results provided by this study may enable educational institutions undertaking campus-wide e-learning programs and projects to align their designs on demographic factors (age, gender and experience) affecting users' satisfaction. Specific findings of this study offer empirical justifications that may help course creators to develop strategies and activities toward quality VLE implementation. For example, teachers may initiate learning routes and evaluation regarding collaborative actions in problem solving through the use of blogs, forums and chat.

As mentioned, the VLE can be utilized to facilitate learning and improve students' performance. Thus, the need for a periodic and continuous evaluation to identify strengths and weaknesses of such learning system is essential.

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