SMCC Higher Education Research Journal
ISSN Print: 2449-4402 · ISSN online: 2467-6322
Volume 3 · January 2017

Proposed Blended Learning Model for Don Mariano Marcos Memorial State University - South La Union Campus (DMMMSU-SLUC)

AGUSTIN R. VERAS, JR.
http://orcid.org/0000-0003-3598-8533
averasjr@yahoo.com
DMMMSU-SLUC, San Antonio,
Agoo, La Union, Philippines

ABSTRACT

Blended Learning (BL) combines face-to-face and on-line learning. The study showed the contributions of the developed content management system using DRUPAL in a BL approach at DMMMSU-SLUC specifically at the College of Computer Science (CCS), Agoo, La Union, Philippines. Then, a proposed model was developed as a guideline for the implementation of BL for campuses who wish to experiment with BL approach. The extent of readiness for the University, Faculty and Students was sought. Professional Ethics in IT, an undergraduate course was delivered as BL uploaded to a Webhost. The respondents of the study classified as the control group and the experimental group. A questionnaire was adopted and used. Frequency and mean were used to interpret data. Results showed that the institution is not ready for BL approach. Faculty members and students are ready for blended learning approach. The results of the final grades of the Experimental and Control groups using the mean grade is higher than that of the control groups indicating that learning took place. Findings showed that the experiment was effective as indicated by a higher mean of the experimental group. The institution needs attention on the implementation of BL. The University must adopt the Blended learning approach.

KEYWORDS

Blended learning, content management system, Agoo, La Union, Philippines.

INTRODUCTION

Due to a vast number of emerging technologies, student's eagerness demands its inclusion in the teaching and learning strategies of colleges or institutes. It has to be an integral part of the current curriculum of the school system. Blended Learning (BL) is gaining acceptance and being adopted at college campuses throughout the US (Bonk & Graham, 2005; Allen & Seaman, 2004), and it has also become an emerging strategy in the Philippine Education System (Refre, 2012; Arimbuyutan, 2007).

With the modernization of the educational system, the researcher saw this as a concern of DMMMSU-SLUC, particularly College of Computer Science. Thus, the campus and the CCS joined efforts to fulfill the directives to provide students with knowledge and skills they need. Computer courses in the University are of great importance for nation's development.

Technology has indeed changed learning strategies. It has made the classroom setting as a thing of the past. It has also changed the mode of instruction the students wanted. Educators should, therefore, equip students with lifelong learning skills that they need to thrive in the digital age. They should be able to create learning environments that foster flexible and authentic learning, which is essential if they are to succeed in this rapidly changing world (Pascual, 2012).

In the pre-technology education context, the teacher is the source, the educational material is the message, and the student is the recipient. Regarding the delivery medium, the educator can deliver the message via the "chalk-and-talk" method and overhead projector (OHP) transparencies (Damodharan, 2012). It became a popular technique, which has utilized for decades as an educational strategy in all institutions of learning.

Karwar (2014), explained that in education process innovative teaching learning process will get the effective change in a student. Education motivate student to do by Confucius;

"I hear and I forget. I see, and I believe. I do, and I understand".

Traditional classroom delivery, however, has experienced a complete overhaul with the advent of Web 2.0 techniques for delivering course material. The Socratic method of teaching can now be effectively accomplished in an online discussion forum, a synchronous chat session, virtual environments, or in a wiki format. All of these innovative technologies have become part of an instructor's teaching toolkit, and

his or her arsenal for transforming course delivery. This attempt to combine all of the best elements of online and on-ground instruction into a "super-hybrid" of sorts, one that delivers a rich skill set and a valuable educational experience to students is called blended teaching (Gilbert, et al., 2005).

The three most commonly mentioned definitions of Blended Learning are documented by Graham, Allen, and Ure (2003). It is the process of (1) combining instructional modalities (or delivery media) (Bersin & Associates, 2003; Orey, 2002a, 2002b; Singh & Reed, 2001; Thomson, 2002), or (2) combining instructional methods (Driscoll, 2002), or (3) combining online and face-to-face instruction (Rooney, 2003; Sands, 2002; Ward & LaBranche, 2003; Young, 2002).

OBJECTIVES OF THE STUDY

This study intends to propose a Blended Learning Program for Don Mariano Marcos Memorial State University – South La Union Campus (DMMMSU-SLUC). Specifically, it sought answers to the following objectives: (1) To determine the extent of readiness of the University, faculty, and students; (2) to determine the extent of effectiveness of the blended learning approach; (3) and to propose a program for the blended learning approach for DMMMSU-SLUC.

METHODOLOGY

Two groups of the third year BS Computer Science students served as the subjects of the study. The researcher randomly identified the section to be assigned to the experimental treatment through the flipping of a coin. Based on the results of the flipping of a coin, BSCS III Section A was assigned to the experimental group while the BSCS III Section B to the controlled group.

Moreover, face-to-face (F2F) interaction was also required in the experimental group. During this session, concerns, queries or problems regarding the lessons were tackled. It was also during this time that examinations were conducted. The researcher only conducted exams/quizzes during F2F sessions for avoiding security in the reliability of exam results. On the other hand, students assigned to the controlled group underwent class discussions on lecture rooms.

Research Design

The study used the Pretest-Posttest Experimental Group Design or Posttest-Only Control Group Design. It involves the following steps: (1) random assignment of subjects to experimental and controlled groups. (2) Administration of the treatment to the experimental group but not in the control group, and (3) administration of a posttest to both groups (Borg and Gal, 1979).

To illustrate:

Where:
R – Random assignment to separate treatment groups
O1 – Experimental posttest
O2 – Control posttest
X1 – experimental treatment
EG – Experimental Group
CG – Control Group

Research Instruments

The researcher used a teacher-made test consisting of items that were item-analyzed to ensure the validity and reliability of the instrument. The test was used as posttest for the study.

The result of the reliability of the test using the Pearson r formula was r=0.9351. Based on the interpretation of the index of difficulty and index of discrimination, 20 items were "discarded," 15 were "accepted items," 12 items "may need revisions," and 8 items "needs revisions." If the total accepted items ("accepted," "may need revisions," and "needs revisions") has at least 50% from the overall test items, then the teacher-made test is the acceptable instrument, (Padua and Santos, 1997).

To determine the reliability of the test, the test-retest method was employed. Index of discrimination and level of difficulty, the coefficient of reliability was computed and some items were deleted, revised and accepted.

Items that have discarded may be deleted or revised. Items that "needs revision" may also be revised or leave as is. The LMS-based material was validated by five computer experts using a questionnaire. The questionnaire was based on the content validation of Vasay's (2006) instrument.

Data Analysis

Specific problem number one intends to determine the extent of readiness of the University, the Faculty and the students for blended learning approach. The researcher used the weighted mean, t-test for independent samples and Pearson-r correlation to interpret results.

The proponent adopted questionnaires to determine the readiness of the University, the Faculty and the students for blended learning. To determine the readiness of the university, the researcher adopted the questionnaire from Leterbach, et al. and Lajuar, et al.

In the same manner, the questionnaire for the faculty readiness was adopted from McQuiggan, Youville Public Schools and Learning with Technology. Student readiness questionnaire was also adopted from University of Minnesota Technology Survey 2011.

To establish the results of the readiness of the students, faculty members and institution to blended learning, a questionnaire was used with its point scores and descriptive ratings using its scale as illustrated below:

Point Mean Range	**Qualitative Description**
5 4.20 – 5.00	Very Much Sufficient/ Very Much Extent
4 3.40 – 4.19	Sufficient / Great Extent
3 2.60 – 3.39	Neutral/ Moderately Extent
2 1.80 – 2.59	Insufficient/ Little Extent
1 1.00 – 1.79	Very Insufficient/ Least Extent
Point Mean Range	**Qualitative Description**
5 4.20 – 5.00	Excellent/ Always
4 3.40 – 4.19	Very Good/Almost Always
3 2.60 – 3.39	Good/Occasionally
2 1.80 – 2.59	Acceptable/Fairly/Rarely
1 1.00 – 1.79	Poor/Not at All
Point Mean Range	**Qualitative Description**
4 3.25 – 4.00	Very Much
3 2.50 – 3.24	Much
2 1.75 – 2.49	Little
1 1.00 – 1.74	Very Little
Point Mean Range	**Qualitative Description**
5 4.20 – 5.00	Very Useful/Very Much Prefer
4 3.40 – 4.19	Moderately Useful / Prefer
3 2.60 – 3.39	Slightly Useful/ Neutral
2 1.80 – 2.59	Somewhat Useful/ Prefer
1 1.00 – 1.79	Not at all useful/ Not Prefer

Research problem number two sought to determine the effectiveness of blended learning approach. It first focused on the validity of the instruments to be used and content validity of the developed content management system using DRUPAL.

Its validity was focused on the rating of five instructors/administrators and students using the scale as illustrated below:

Point Mean Range	Qualitative Description
4 3.25 – 4.00	Very Much
3 2.50 – 3.24	Much
2 1.75 – 2.49	Little
1 1.00 – 1.74	Very Little

The level of performance of the experimental and control group was determined using the results of the posttest administered to the respondents. The result of the posttest was determined using the t-test set at 0.05 level of significance.

In problem number three, the researcher attempted to propose a model for the blended learning approach for DMMMSU-SLUC.

RESULTS AND DISCUSSION

Students' Readiness

The results indicate, in general, that the use of blended learning in their course/ subject is plausible. The results provided an overall picture about students' competitiveness in the use of technology in learning, their perceptions about the use of technology in blended learning, their self-motivation, and study habits. It can, therefore, be concluded that students are ready for a blended approach to learning.

To enable learners to become self-motivated, self-reliant and self-managing (Johnston et al., 2005) as cited by Khitam, et al., it should be emphasized here on the implementation process mainly at the initial stage. There is a need to initiate awareness among the educationists and students to change their attitudes and bring their attention to the potential of these models to improve the learning process.

Faculty Readiness

Most educators use a variety of tools including video, e-mail, desktop conferencing, online programs such as WebCT and Blackboard, as well as video conferencing to teach. Thus, it is no longer acceptable for educators to be technology illiterate. Because as computer and associated technologies continue to evolve, teachers should pursue strive for excellence in their work. (Turner, 2005). In general, faculty members are ready for blended learning approach.

Institutional Readiness

Based on the results, it was found out that the campus has insufficient facilities to support blended learning as evidenced by a 2.5 category mean. The institution is not ready for blended learning approach. Based on the responses, it can be seen that the campus has the little extent to support blended learning course. It may be attributed to the fact that the campus, so far, does not have any experience in online-related courses. It may also be attributed to the insufficient resources for its implementation and sustainability. On the positive side, administrators believe that using technology in learning improves instruction. There is a provision for the exploration of new ways of delivering the lessons through innovative methods.

Sharpe et al (2006), reviewed existing research and practices on blended learning undertaken by Oxford Center for Staff and Learning Development at Oxford Brookes University for the Higher Education Academy. All seven institutions visited described current plans for initiating institutional monitoring and evaluation strategies to assess their students' experiences. However, their findings at all institutional level practices were problematic. This was due to the pressure to implement rather than evaluate, the low status of pedagogic research, and poorly defined measures of institutional success in embedding blended e-learning. Nonetheless, all institutions welcomed the opportunity to share approaches both through this review and the Academy's Benchmarking e-Learning project.

Effectiveness of the Blended Learning Approach

The experimental group mean grade is higher than the controlled groups. This situation indicates that they have learned more.

The results shown in Table 2, further strengthen the effects of the BL with a computed F value of 0.014 at 0.05 level of significance. The results indicate that the Final grades of the students in the experimental group are significantly higher than the mean final grades of the control group. This implies that the BL approach is effective compared to the traditional approach.

Table 1. Results of the Analysis of the Final Grades of Experimental and Control Groups using the mean

GROUP STATISTICS					
	1.1.1. GROUP	**1.1.2. N**	**1.1.3. MEAN**	**1.1.4. STD. DEVIATION**	**1.1.5. STD. ERROR MEAN**
Grades	Experimental	36	85.17	3.325	.554
	Control	39	83.41	3.118	.499

The study supports Robles' (2011) conclusion that blended learning helps significantly in improving the students' performance; hence, students' performance increases. The findings also support Ebardo's (2012) research which he conducted at Jose Rizal University. In his study, he concluded that knowledge acquisition skills of the students improved through the intervention of LMS.

Moreover, Rodriguez (2010) confirmed in his research that there was a significant difference in the mean achievements of the two different respondents or groups in all areas under consideration in favor of the blended learning strategy. In like manner Rolluqui (2011) adopted the use of Blended E-Learning Management system and found out that the systems evaluation showed a very satisfactory rating to Technological University of the Philippines.

Al-Saai, et al. (2011) concluded in their research that the attitudes of online students improved compared to the students in the face-to-face teaching approach. Such a result might be due to the interaction of the students in this group with the e-learning environment which affected their attitudes toward the E-learning environment. The e-learning setting was associate degree interactive learning setting that created a high degree of interaction between students, students and course content, and students and teacher. It seems that this type of environment created a better chance for students and instructor involvement which provide the social context needed for learning in its relation to the emotional domain of learning

Proposed Model for Blended Learning Approach for DMMMSU

The next table presents the different phases on how to implement the BL. It is important to emphasize that a successful blended learning instructional implementation is correlated with several factors. Success is highly dependent upon an instructions ability to support the blended instructional model and existence of a high-quality, well-designed (and supported) faculty development plan. (Wallace and Young, 2009).

Table 2. Implementation of Blended Learning Approach for DMMMSU

Phase	Objectives	Activities	Output
Phase 1. **Preparation**	To determine if the institution, faculty and students are ready for blended learning approach	Prepare/adopt a questionnaire to determine the readiness of the institution, faculty and students.	Questionnaire on the readiness of the institution, faculty and students.
	To determine if the curriculum is geared towards the adoption of BL	Revised curriculum in order to align courses to BL approach (if necessary)	Revised curriculum

Phase	Objectives	Activities	Output
	To create a college strategic plan to support the blended learning program	Develop a strategic plan to allocate funds for infrastructures in ICT (construction of lab rooms, hardware and software needed for BL, networking devices, etc.)	A developed strategic plan to allocate funds for ICT infrastructures
	To train students on how to use the CMS.	Conduct a training/ Orientation on how to manipulate the CMS in this way, students will be comfortable to use the CMS maximizing all its features. Solicit suggestions on how to implement BL	Training/ Orientation during the first two meetings. Suggestions or recommendations on how to implement BL.
	To train faculty members in CMS or LMS of their choice.	Prepare a training session or conduct an in-house training in using CMS or LMS. Or send faculty members to be trained using CMS or LMS.	Faculty Development plan which includes seminars or training of faculty members in CMS or LMS.
	To allocate budget for the implementation of BL	Administrators may submit proposals to private/LGU's for sponsorships. Linked or tie-up with other universities who are implementing BL.	Build sponsorship.
Phase 2 **Implementation**	To train faculty members to develop effective learning materials/modules.	Faculty members should be able to develop an effective CMS combining features like feedback option, students and teachers blog, video conferencing, self-paced learning, chats, assessment techniques, assignments, etc.	Modules, CMS/LMS

Phase	Objectives	Activities	Output
	To be able to discuss copyright issues.	Brief students on copyright issues.	Briefing on copyright issues
	To Plan and schedule F2F meetings	Inform students schedule for a F2F meeting. Discuss issues, concerns, problems encountered and incorporate in succeeding online meetings.	Schedule a F2F meeting List of recommendation, suggestions, problems that needs immediate solutions.
	To be able to build community	List down email addresses of each student, send their account name and password through their email address. Address issues like unable to receive account name and passwords, wrong email address and unsent students account.	Final list of students who are enrolled in BL approach.
	To be able to conduct an online session in a laboratory room.	Equip a laboratory room where online sessions will be conducted. This include setting up an internet access and a network desktop. Or provide an internet access in the college to let students access CMS using wifi.	Laboratory rooms with internet access Wifi zone

Phase	Objectives	Activities	Output
	To monitor the implementation of the BL mode.	Administrators will monitor the implementation of the BL course by assessing the operation capability of the college/unit in terms of infrastructure and support. Administrators will support the implementation of BL by studying budget requirements of the college or unit and the increase number of enrolment. Administrators may recommend for the approval of the budget allocation in terms of BL requirements to the university level.	Infrastructures Approved budget sustainability
Phase 3 **Evaluation**	To conduct an evaluation assessment among students in terms of satisfaction.	Faculty members will conduct an interview or prepare questionnaire to determine the satisfaction of the students who underwent BL approach	Problems encountered, issues, concerns and good point of students who took BL
	To conduct an evaluation among faculty members in terms of level of satisfaction in BL	Float questionnaires to Faculty members to determine their level of satisfaction in conducting BL approach	feedbacks

Phase	Objectives	Activities	Output
	To provide administrators analysis in terms of cost in implementing BL.	Prepare a chart showing the benefits of BL in terms of its cost effectiveness	Cost effectiveness chart
	To ensure sustainability in the implementation of BL	Prepare enrolment trends.	Enrolment chart
		Show results of the effectiveness in terms of learning.	Results of effectiveness

CONCLUSIONS

The institution is not ready for blended learning approach. The institution needs attention as to the implementation of BL. Due to many requirements needed to implement BL, the institution is not ready for its implementation. But the willingness of the administrators to comply with the requirements of technology, infrastructure and student support in implementing BL plus their belief that technology is indeed a component of learning helps the researcher developed a model for DMMMSU-SLUC.

Faculty members are also ready with regards to shifting their teaching approaches to blended methods. Most of them do not have any experience in online learning or online teaching, however; they are willing to attend training and programs related to online or blended learning.

As to the readiness of students to BL approach, results show that students are ready for BL approach. Students willing to use utilize blended method because of various technology familiarities. Though little worries are seeming due to financial fears as students are unable to wage rents from internet cafes because of the lack of internet connection in the school. Learning is also manifested in the experimental group because of the major difference in their low grade equated to control group.

The proposed model developed by the researcher has three major components. These components affect the implementation of blended learning approach at DMMMSU-SLUC which includes the students, faculty and the institution (Administration). These are the key players that make its implementation successful. The willingness to migrate from a brick and mortar session to a blended mode solely depends on the support and unified interaction among these components. It is within this purview that this model was developed.

The model addressed issues like the need to determine if the students, faculty and the institution are ready for a blended learning approach. It defines the roles of these

components in the preparation, implementation and evaluation stage. Finally, the three components should be unified to support the implementation of BL to be successful.

LITERATURE CITED

Al-Saai, A., Al-Kaabi, A., Al-Muftah, S.,(2011), *Effect of a Blended e-Learning Environment on Students' Achievement and Attitudes toward Using E-Learning in Teaching and Learning at the University Level,* Qatar University

Allen, Belinda, A model for transformation: A transdisciplinary approach to disseminating good practice in blended learning in a science faculty, 2010.

Allen, I. E. & Seaman, J. (2005). *Growing by degrees: Online education in the United States, 2005*. Needham, MA: Sloan- Consortium.

Allen, E., & Seaman, J. (2003).*Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003*.Retrieved Jan 7, 2013 from http://www.sloanc.org/resources/sizing_opportunity.pdf

Arimbuyutan, Reynato C, Et al (2007), A Study on e-Learning for Philippines; International Journal of Multimedia and Ubiquitous Engineering Vol. 2, No. 4, October, 2007; retrieved April 21, 2012 at http://www.sersc.org/journals/IJMUE/vol2_no4_2007/5.pdf

Bersin & Associates. (2003). *Blended learning: What works? An industry study of the strategy, implementation, and impact of blended learning.* Oakland, CA: Bersin & Associates.

Bersin, J. *Blended Learning Handbook*. San Francisco: Jossey-Bass, 2004

Bonk, C. & Graham, C. (2005). *Handbook of blended learning: Global perspectives, local designs*. San Francisco, CA: Pfeiffer Publishing.

Damodharan, V. Rengarajan.V, Innovative Methods of Teaching AICWA, retrieved May 3, 2012 at http://math.arizona.edu/~atp- mena/conference/proceedings/Damodharan_Innovative_Methods.p df

Driscoll, M. (2002, March 1). Blended learning: Let's get beyond the hype. *e-learning.Retrieved April 28, 2012, from* http://www.ltimagazine.com/ltimagazine/article/articleDetai l.jsp?id=11755.

Ebardo, Ryan A, Valderama, Arlene Mae C., The Effect of Web- Based Learning Management System on Knowledge Acquisition of Information Technology Students at Jose Rizal University, retrieved on May 1, 2012 at http://www.ijcim.th.org/SpecialEditions/v17nSP3/09_Full_Rya n%20A.%20Ebardo .pdf

Gilbert, J., MERLOT Journal of Online Learning and Teaching Vol. 7, No. 2, June 2011

Gilbert, L, Wang, C. and Sim, Y., "An e-Learning Systems Engineering Methodology", *Proceedings of the Fifth IEEE International Conference on Advances Learning Technologies (ICALT '05)*, ISBN 0-7695-2338-2 , pp. 150– 154. 2005

Johnson, J., Killion, J., Oomen, J.(2005). *Student satisfaction in the Virtual Classroom*. *The Internet Journal of Allied Health Sciences and Practice.*

Orey, M. (2002a). *Definition of blended learning.* University of Georgia. Retrieved April 30, 2012, from http://www.arches.uga.edu/~mikeorey/blendedLearning.

Orey, M. (2002b). *One year of online blended learning: Lessons learned.* Paper presented at the Annual Meeting of the Eastern Educational Research Association, Sarasota, FL.

Pascual, ALFREDO E., President University of the Philippines System, Message, 1st International Conference on Distance e-Learning Conference, ICODEL, April 2012.

Refre, Antonio, E., An Innovative Strategy in Establishing Online Education in the Philippines' Higher-Education- Institutions (HEIs). Retrieved May 2, 2012 at http://elearning.ph/web/userfiles/refrepaper.pdf

Rodriuez, Marissa A., Anicete, Raymond Charles R., Students' Views of a Mixed Hybrid Ecology Course, MERLOT Journal of Online Learning and Teaching Vol. 6, No. 4, December 2010, retrieved on May 1, 2012 at http://jolt.merlot.org/vol6no4/rodriguez_1210.htm

Rooney, J. E. (2003). Blending learning opportunities to enhance educational programming and meetings. *Association Management.*.

Sharpe. R., Benfield, G., Roberts, G., Francis, R.,*The undergraduate experience of blended e-learning: a Review of UK literature and practice,* Higher Education Academy – October 2006

Singh, H., & Reed, C. (2001). *A white paper: Achieving success with blended learning.* Centra Software. Retrieved May 1, 2012,from http://www.centra.com/download/whitepapers/blendedlearning. pdf.

Singh, H., Building Effective Blended Learning Programs., Issue of Educational Technology Vol. 43, No. 6., pages 51-54, download at http://jw1.nwnu.edu.cn/jpkc/jcxy/JXSJ/web/zhuantixuexizilia o/Building%20Effective%20Blended%20Learning%20Programs.pdf on June 2012.

Singh, Harvi and Chris Reed, (2005) . "A White Paper: Achieving Success with Blended Learning." Centra White Paper. http://www.centra.com/download/whitepapers/blendedlearning.pdf

Thomson, I. (2002). *Thomson job impact study: The next generation of corporate learning.* Retrieved April 23, 2012, from http://www.netg.com/DemosAndDownloads/Downloads/JobImpact.p df.

Vasay, E.T., *The Effectiveness of Multimedia Instructional Materials in Trigonometry, Dissertation, DMMMSU – SLUC, June 1999.*

Wallace, L and Young, J; downloaded at http://www.westga.edu/~distance/ojdla/winter134/wallace_young134.html, November 8, 2012

Young, J. R. (2002). "Hybrid" teaching seeks to end the divide between traditional and online instruction. *Chronicle of Higher Education*.