Analyzing Applications and Problems of Blended Learning (BL) for Agricultural Students

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Abstract

This study was an attempt to analyze the applications and problems of conducting blended learning (BL) in view point of the agricultural students from Bu-Ali Sina University. The study has employed a surveying methodology with interviewing and included a combination of descriptive and quantitative research methods. Statistical population of the study included 500 agricultural students from Bu-Ali Sina University in 2011 academic year. The factor analysis method was utilized in accordance with the KMO and Bartlett tests to assist in extracting the most important factors related to applications and problems of conducting blended learning. Findings of factor analysis indicated that blended learning applications fall into seven categories of components include: 1) attention to students' needs and individual differences, 2) flexibility in time and place, 3) active involvement and participation of the students in teaching and learning, 4) improvement the quality of education, 5) synchronization of using different educational contents and media, 6) access to up-to-date information and required contents, and 7) possibility of implementing different teaching strategies. The results showed also conducting the blended learning encountered 19 problems. The highest problems in rank were 1) lack of training course on blended learning, 2) lack of familiarity with multimedia teaching methods, 3) network disconnect problem, and 4) lack of students' knowledge toward blended learning. **[Reza Movahedi. Analyzing Applications and Problems of Blended Learning (BL) for Agricultural Students. International Journal of Agricultural Science, Research and Technology, 2012; 2(3):149-155].**
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1. Introduction

After more than a decade of e-learning experience around the world and recognizing its shortcomings, many educational planners found out they can reach to new model of education namely blended learning (BL). This model is offered by combining e-learning and face- to- face learning, which will be better than both other models in terms of the quality (Osguthorpe & Graham, 2003). Blended learning is an educational style that utilizes both virtual and real environment. In other words, blended learning is a new approach in curriculum planning in which a combination of both electronic and face-to-face learning is used to teach a curriculum (Mahdavi, 2005).

Blended learning as an important tool for better learning, good quality, and less costs has important role in each educational system. A high percentage of successful Web-Based Education (WBE) and information technology practices depends on quality of curriculum content used by educational centers. Of the blended learning strengths is to teach flexible content and use of multimedia features that enables any trainers in providing teaching with higher quality (Belaghi, 2005).

A decrease in quality of education and focus on traditional and inefficient education methods are two main challenges in all today educational system around the word. With regard to this point that digital technologies on education are increasingly developing, it seems that to integrate electronic and traditional teaching methods can cause fundamental change in educational methods (Graham & Charles, 2004).

If e-learning and traditional education with their deficiencies and inefficiencies link together they can serve the educators and learners as a high quality method. Preference of blended learning to e-learning and face-to-face education in terms of its high quality and lower cost has made it very important in all educational centers and higher education systems as quickly as possible. Educational experts believe this method will create a vital change in teaching methods in a not remote future (Thorne, 2003).

The major research problem that will be addressed in this study is, accordingly, to reveal what applications, benefits or problems may be created for the agricultural students at the university level by conducting a blended learning model. Therefore, this study was an attempt to analyze the applications of

blended learning model in view point of agricultural students from Bu-Ali Sina University as well as to review some problems facing conducting blended learning for the students.

1.1. Preferences of a blended learning (BL) model

Blended learning (BL) describes learning activities that involve a systematic combination of co-present (face-to-face) interactions and technologically-mediated interactions between students, teachers and learning resources (Bliuc, Goodyear, and Ellis, 2007). In blended learning environments, the importance of students' self-motivation and self-management increases because there is less in-class time and more emphasis on self-regulated learning. However, several researchers found that students had difficulty adjusting to blended learning (Aycock, Garnham, and Kaleta, 2002; Bonk, Olson, Wisher, & Orvis, 2002). In conducting blended learning environment, simply turning classroom courses into blended formats do not necessarily provide students with more interactive and flexible learning experiences. More careful analysis of learners, contexts, and technologies are needed (So and Brush, 2008). Holley and Oliver (2010, 699) also implied that simply providing e-learning – no matter how well intentioned – is insufficient to address the problems that students are experiencing.

If a blended learning course is well planned, developed and conducted, its cost effectiveness is obvious and proven (Mortera-Gutierrez, 2006). In fact, there is an increasing trend to integrate the two learning environments as a single system. Nowadays, more and more universities conduct the learning activities under both environments (Wang, Fong, and Choy, 2007).

There are three reasons why the adoption of blended learning is inevitable: 1) Use of computers and the internet is widespread and growing in all walks of life, 2) There is an increased demand for higher education world-wide and increased pressure on lecturers to use technology to cope with it, and 3) Learning by means of information technology can now provide significant learning advantages for the student provided appropriate design is employed (4 Ps, flexibility in place, pace, peace, and process) (Alberts, Murray, Griffin, and Stephenson, 2007).

Universities and faculties are looking for ways to reach and retain the students. By putting course materials on the Web, students can access the material at any time of day and review it as needed, which provides them with increased flexibility (Hopper, 2003). By reducing time and space commitment, access is easier and thus many students have come to prefer these courses over the face-to-face counterparts (Dziuban, Moskal, and Hartman, 2005).

The use of blended learning techniques takes advantage of the variety of learning experiences that can be offered by the use of a mix of learning environments (Reid-Young, 2003); for example, lectures, workshops, self-paced study, online collaboration and communication exercises, simulations and the use of interactive multimedia (Draffan and Rainger, 2006).

1.2. Background information

Although there are numerous individual studies on employing new technology in education, a coherent theory on which to hold on in using blended learning courses is missing (Nichols, 2003) especially in developing countries. Therefore blended learning aspects need to be discovered and tested incrementally to acquire skills and familiarity in employing them (Derntl and Motschnig-Pitrik, 2005).

Finn and Bucceri (2004) claimed that blended learning provides all the benefits of e-learning including lower cost, efficiency, and convenience for the learner. It can even provide the one-on-one personal guidance and motivation that face –to- face instruction offers. Blended e-learning promises to be a major instructional movement in the future (Yen and Lee, 2011).

Research findings from Bonk and colleagues have shown that learners had difficulty adjusting to BL environments due to the potential problems in computer and Internet access, learners' abilities and beliefs in the use of technology, blended course design, participant interaction, and blended environments integration (Bonk et al., 2002). These findings imply that an effective BL environment should consider the human and technology factors that affect learner satisfactions with BL, such as individual attitudes, participant interaction, educational technologies, and course design (Wu, Tennyson, and Hsia, 2010).

Results of Stricker, Weibel, and Wissmath (2011) showed that use of a virtual learning environment (VLE) as an addition to a face-to-face lecture is beneficial. They also found that students do not automatically benefit from using the VLE. This means, that among all participants, VLE-users did not perform better in the final exam compared to non-users. The e-learning tool was only useful when the students had spent a certain amount of time (at least about 2 h per week) to get familiar with the basic concepts and key terms of the topic. According to Stricker et al. (2011) online learning, in addition to a face-to-face lecture, may enhance students' performance without increasing their workload too

much. In contrast, it has been demonstrated several times that online learning increases the workload (Carr, 2000; Dutton, Dutton, and Perry, 2002), which in turn leads to a higher dropout rate for online students.

Learning requirements and preferences of each learner tend to be different. Organizations must use a blend of learning approaches in their strategies to get the right content in the right format to the right people at the right time. Blended learning combines multiple delivery media that are designed to complement each other and promote learning and application-learned behavior (Singh, 2003).

2. Materials and methods

This study has employed a surveying methodology with interviewing and included a combination of descriptive and quantitative research methods. The instrument of the study was a questionnaire with both open and closed questions. The questionnaire consisted of four parts: personal demographic characteristics, questions about blended learning applications, different problems about conducting blended learning at university, and an open ended question.

The questionnaire was also checked for face validity by professors and educational experts. Moreover, to assure the reliability of the questionnaires, they were pilot-tested amongst a group of 30 graduated students who were comparable with the survey population at the College of Social Science of Bu-Ali Sina University. For Likert-type questions, the questionnaires' reliability was tested by Cronbach's Alpha technique. The total mean reliability of scales for the questionnaires was 86.3. After finalizing the questionnaire and gathering the needed data they were processed and analyzed within SPSS statistical software.

Statistical population of the study included 500 both postgraduate and senior undergraduates in eight departments of agricultural faculty at Bu-Ali-Sina University. the study conducted in 2011 academic year. A number of 217 samples were selected by a random sampling method using Kerjcy and Morgan sampling size estimating table. Both descriptive and analytical methods were employed in order to analyze the quantitative data. Descriptive techniques included: frequency distribution tables, valid percent, mean, standard deviation, and variance. Analytical technique utilized in this study was factor analysis test. The factor analysis method was utilized in accordance with the KMO and Bartlett tests to assist in extracting the most important factors related to applications of blended learning.

3. Results and discussion

The results showed that (66.8%) of the students were female and the rest (33.2%) were male. In terms of age, the students ranged between 20 and 31 years old, with an average of 24.54 years. Of total 210 respondents, 110 were postgraduates and 100 were senior undergraduates. Of total 210 respondents, 31 were studying at department of agricultural education and extension, 29 at horticulture, 27 at agronomy, 23 at soil science, 25 at plant sciences, 23 at animal sciences, 30 at water engineering, and 22at machinery departments form Bu-Ali Sina University.

3.1. Problems related to conducting blended learning

The students were asked to rate 19 problems related to conducting blended learning at university level on a Likert-type scale from 1= very low to 5= very high. As shown every 19 problems got a value higher than mean. This reveals that the agricultural students face all these problems when conducting a blended learning model in their university. furthermore, the lack of training courses about blended learning in university was identified as the most important problem with the highest rank, but decreasing the social relations among the students has been ranked in the lowest location.

3.2. Factor analysis results

To determine whether or not the variables are usable for factor analysis, Kaiser-Meyer-Olkin (KMO) and Bartlett's tests are usually used. The KMO test was used to measure the sampling adequacy and Bartlett's Test of Sphericity to determine the identity of the correlation matrix. If the KMO value is less than 0.5 the data will not be suitable for factor analysis if the value is greater than 0.7 the correlations between data will be appropriate for factor analysis (Kalantari, 2003). In this study, the Kaiser-Meyer-Olkin value (KMO=0.864) indicated an adequate sampling for the factor analysis and the result of Bartlett's test of Sphericity was significant (p<.01). The results of KMO and Bartlett's Test are presented in Table 2.

As can be seen in table 3, the extracted seven factors had the highest amount of overlap (in terms of calculated variance). This means these factors can explain more than 66 % of the total discrepancy among the variables.

Findings of factor analysis indicated that blended learning applications fall into seven categories of components. They are as follows: 1) attention to students' needs and individual differences, 2) flexibility in time and place, 3) active involvement and participation of the students in teaching and learning, 4) improvement of quality of

education, 5) synchronization of using different educational contents and media, 6) access to up-to-date information and required contents, and 7) possibility of implementing different teaching strategies.

As shown in Table 3, the seven mentioned factors explain 66.172% of the total discrepancy among the variables. It should be noted that more than 34% of the total discrepancy among the variables was explained only by one factor include: attention to students' needs and individual differences.

In table 4, the results from rotated matrix of the variables have been shown. The Eigenvalues, the numbers of extracted factors from rotated matrix, and each of variables have been also illustrated.

Table 1. Problems related to conducting blended learning

Problems	Mean	Standard Deviation	Rank
Lack of training course on blended learning	3.977	.96080	1
Lack of familiarity with multimedia teaching methods	3.878	.78176	2
Network disconnect problem	3.871	1.06581	3
Lack of students' knowledge toward blended learning	3.856	.92574	4
Lack of infrastructure regarding ICTs	3.856	1.02736	5
Problems related to development and management BE	3.825	.90373	6
Lack of university teachers' skills towards teaching techniques of BL	3.825	1.05928	7
No funding in budgeting	3.825	.92873	8
High costs needed for supplying computer and internet systems	3.825	1.05928	9
No use of BE at universities	3.818	.94762	10
No belief of the current educational system to the applications of BL	3.810	.85723	11
Problems of setting time	3.795	.95501	12
No belief of university teachers to BL	3.780	.86769	13
Inadequate attention to virtual and on-line education	3.719	.91896	14
Not enough skills of using ICTs	3.704	1.02442	15
Uncertainty in achieving educational goals and learning outcomes through BL	3.689	1.00482	16
Scarcity of experts on BL	3.651	1.09812	17
Low speed of information recovery	3.628	1.02194	18
Decreasing the social relations among the students	3.575	1.07093	19

Table 2. KMO value and Bartlett test results

KMO value		0.864
Bartlett test	Approx. Chi-Square	1.95
	df	378
	Sig.	0.000

Table 3: Number of component, initial eigenvalues, % of variance and cumulative percent

Factors	Initial eigen value	% of variance	Cumulative percent
Attention to students' needs and individual differences	9.762	34.864	34.864
Saving and flexibility in time and place	2.359	8.426	43.290
Active involvement and participation of the students in teaching and learning	1.657	5.918	49.209
Improvement of quality of education	1.357	4.845	54.054
Synchronization of using different educational contents and media	1.202	4.294	58.348
Access to up-to-date information and required contents	1.155	4.126	62.473
Possibility of implementing different teaching strategies	1.036	3.699	66.172

Table 4: The results from rotated matrix of the variables

Extracted factors	variables	eigenvalue
Attention to students' needs and individual differences	Flexibility in teaching methods	0.697
	More attention to student's need	0.751
	Quick learning and studying	0.601
	Curiosity and initiative	0.719
	considering students' individual differences	0.746
Saving and flexibility in time and place	Saving time	0.591
	Saving place	0.766
	Flexibility in time	0.711
	Flexibility in place	0.761
	Saving costs	0.527
Active involvement and participation of the students in teaching and learning	More involvement and participation by students in the learning process	0.636
	Possibility of using active and interactive training methods	0.613
	Possibility of using interactive and critical learning methods	0.570
	Possibility of using FAQ methods	0.544
	Take advantage of personal email	0.642
Improvement of quality of education	Saving costs	0.527
	Increasing quality of education	0.659
	Possibility of communicate with responsible people	0.649
Synchronization of using different educational contents and media	Take advantage of multi-media simultaneously	0.546
	Increasing quantity of education	0.528
	Allowing to teach divers educational contents	0.657
Access to up-to-date information and required contents	Greater access to new technologies	0.524
	Accessibility to up-to-date information	0.602
	Developing educational contents according to student's needs	0.540
	Educational contents can be changed continuously	0.689
Possibility of implementing different teaching strategies	Implementing decentralized planning	0.728
	Possibility to use student-centered teaching strategies	0.783

About problems faced to apply blended learning applications, the students were asked to add their ideas basis on an open question. The gathered answers then were analyzed by using a content summarizing method so that the repeated ideas were summarized into common themes. Finally, common themes which extracted from textual data were:

1) Low access and inadequacy of internet services,
2) Inadequacy of computer and internet infrastructure specific for blended learning,
3) No awareness of blended learning,
4) No training courses whether for students or professors,

4. Conclusion and Recommendations

Results obtained from prioritization of blended learning applications for the agricultural students showed that three following applications as the factors with highest priority: 1) possibility of access to up-to-date information; 2) greater accessibility to modern technologies; and 3) flexibility

in teaching methods. Promoting blended learning can, thus help learners to acquire new information so as to solve a major part of the problems faced with traditional education. Also, possibility of access to modern technologies has been recognized as one of the important applications of blended learning. Therefore, blended learning can facilitate utilization of various technologies to improve the quality of education which is one of the basic aims in every educational system i.e. agricultural higher education. By using different technologies, blended learning system may obtain relative advantages as compared to other educational systems. These findings have also been emphasized by Wu et al (2010), Singh (2003), and Bonk et al. (2002).

As Alberts et al. (2007) apparently delineated flexibility in place, pace, peace, and process of the blended learning; according to the results of this research flexibility in educational methods was another blended learning application with a high priority. As learning principles emphasize on using different flexible educational methods for improving

the quality of education, the blended learning system may help easy access to effective learning aims and improvement of quality in education.

As far as the problems in blended learning are concerned, the findings well reveal that the major problems are as follows: lack of awareness about blended learning; lack of familiarity with multimedia teaching methods; network and internet disconnect; and lack of adequate information and communication facilities. The current conditions for implementing blended learning for agricultural students are either at initial stages or are not adequately available in all universities in Iran. In order to promote blended learning, it is thus recommended to organize training courses on a regular basis through action plans at national and institutional levels.

Another barrier to conduct blended learning is lack of knowledge or possibility of using multimedia methods. This is a country wide problem faced with all educational institutions. Two major factors are responsible for this problem. One of them is structural problem related to the classroom environment, in the sense that the classrooms are not equipped with the required training facilities. Other factor is the lack of knowledge on the part of university educators on the impacts and applications of multimedia methods for a better understanding of the contents or syllabi. These results echo the findings by Aycock et al. (2002), and Bonk et al. (2002); while challenged by Belaghi (2005).

In this regard it is recommended that educational and information needs of university educators and students be regularly assessed by instructional designers. This needs assessment would reveal priorities for conducting training courses needed by both university educators and students.

The other important point revealed by the results was insufficient network infrastructure and ICT services. Access to high-speed Internet facilities and development of networks are two basic requirements needed for the success of blended learning. Therefore it is imperative to provide the facilities required for improvement of blended learning including fiber optic, wireless networks, and intranets for favorable conditions. Based on the results, the different applications of blended learning can be summarized and classified into the following seven factors:1) attention to students' needs and individual differences, 2) flexibility in time and place, 3) active involvement and participation of the students in teaching and learning, 4) improvement of quality of education, 5) synchronization of using different educational contents and media, 6) access to up-to-date information and required contents, and 7) possibility of implementing different teaching strategies. Since these factors have not been seen in

other studies by such a way, this result may be used by other educational researchers and planners for the future studies.

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