Addressing Large Student Groups via Blended Learning Approach – Lessons Learnt and Experiences from Sri Lanka

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Abstract

Higher education programmes worldwide are attracting increasing number of students over time. This trend has many underlying factors, and In the case of government universities in Sri Lanka, it is the fact that higher education at present accommodates only less than 10% of the total student population vying for entry.

Pure online delivery of courses aims at undergraduates but has not yet been able to attract the critical mass required to maintain such programs, and accessibility to the Internet is a major contributing factor. As such many courses accommodate large groups of students, which has a negative impact on the quality of education. Blended learning approaches have been introduced to improve this situation.

This paper presents a blended learning approach experimented for teaching two application software packages. The teaching environment is a Computer laboratory complex of a Government University in Sri Lanka. The innovative feature of this blended learning approach is the projection of the live lecture session into a remote lab, in which the students are guided by a projection of the lecture, the projection of the desktop plus the lecturer's voice. This need arises due to a large number of students participating in a single session.

Student feedback obtained via a survey using a sample of 300 students reveals that the students indicate that the virtual lecturer session is sufficient for successfully participating in the lecture session. However, we reveal additional needs pointed out by students, and recommendations on improving the environment.

Keywords: Blended Learning, Virtual Learning Environment, Virtual Classroom, Large Group Teaching.

1. Introduction

In the Global perspective, the Education sector reflects continuous growth irrespective of outlying factors such as economic conditions, and social problems. Statistics from the United Kingdom (Times Higher, 2006) and Sri Lanka (UGC, 2006) reveal that higher education sector reflects this growth behaviour pattern.

In Sri Lanka, 2.9% of GDP is used on Education, with 17.25% a of total spending on Education (0.5% of GDP) utilised for Higher Education. The main beneficiary of this funding is the 15 Government Universities. (UGC, 2006) However this percentage is barely sufficient to cater to the higher education needs of a developing country like Sri Lanka.

58% of candidates are eligible to enter universities, but only 14% of them secure admission.(UGC, 2006). Higher Education Institutes are compelled to work out alternate solutions to accommodate the progressively increasing student intakes.

In keeping to global trends, introduction to new degree programs is a need of the hour. Creating new degree programs and increasing the student population bring forward several other issues to settle. The catalytically skilled teacher in the learning process will handle 20 students – a healthy ratio for nurturing the learning. Although average student to staff ratios are best kept at less than 20, planners of new courses are unable to keep up to such standards.

In analysing the undergraduate intake to Sri Lankan Universities, the University of Sri Jayewardenepura is the Second Largest (UGC, 2007). The Faculty of Management Studies & Commerce of this University has nearly 4000 students on roll. Every student is channelled through the training of Application Software packages. In the training sessions, a subject expert (Lecturer) demonstrates the use of the software packages using a Multimedia Projector and Audio Visual equipment. The students could follow the instructions, and the lecturer would generally not visit the students individually, but additional instructors, were made available to assist students. This methodology of teaching could be extended, but when the session participants reached a figure close to one hundred, the physical dimensions of the classroom makes it impossible for all students to get a clear view of the lecturer, as well as the projection screen. Further it makes it difficult for the lecturer to monitor individual student performances - if necessary.

Most degree programs at the selected faculty cater to One Hundred students or more. We consider this figure to be a large group, and in such situations alternatives must be planned. Limiting the class size inevitably results that the lecturer had to either repeat the class at a separate time, or consider the services of an additional lecturer with a similar teaching capacity. In certain situations both of the options explained could not be considered as viable – due to the hiring cost, availability of the lecturer, and the scarcity of qualified lecturers. This was especially valid when considering Software Packages which were used in specialised domains viz Sage® Accounting Range, AutoCAD® , Arcview® GIS, and Microsoft® Project. The need for a technological solution was born out of this problem. The proposed technology interface solution needed to be cost effective, as technological solutions invariably involves significant financial commitments.

2. Concepts Overview

2.1. Large Group Teaching (LGT)

Cantillon (2003) equates LGT it to lecturing and considers it as an efficient method of transferring concepts and knowledge to large groups, and suggests that this process can be used to stimulate interest, explain concepts, provide core knowledge, and direct student learning. The concept of “how many students” make “large” widely differs in literature across disciplines depending on the proposed learning activities. Several Methodologies are used currently for large groups – Demonstrations, Buzz Groups, Project Work, Group Work etc, but by far the most obvious and common practice is Lectures. Our literature review found limited documentation on large group learning with emphasis on imparting computer skills in a classroom environment.

2.2.Blended Learning

In a strict interpretation, one could consider term "Blended Learning" as simply usage of more than one method for delivery of instructions. Other terms used by some authors (Brown,2001; Young, 2002) when referring to a course that mixes traditional face to face learning with online delivery is "hybrid" or "mixed" Learning . Allen & Seaman (2006) a blended learning course as a course that blends online and face to face delivery. Bersin (2004) describes six phases in which technology based training has evolved as from the 1960s into presently practiced Blended Learning. The requirement at the University and the nature of the course allows the authors to experiment with a blended learning solution to overcome the situation mentioned in our introduction.

2.3. Synchronous Learning

Depending on the time component of distance learning, it can be categorised as synchronous learning and asynchronous learning. The use of Internet Technologies has matured significantly as at present for synchronous learning to be considered as valid for distance learning (Chen, 2004). Synchronous learning requires teachers and students to interact with each other at the same time (even from remote locations). The proposed solution for our University environment should support synchronous learning.

2.4. Learning Management System (LMS)

Moodle, an Open Source LMS, lists sites registered by nine of the fifteen Sri Lankan Government Universities in it's website (Moodle, 2007). The current set of features in Moodle makes it an ideal solution for asynchronous learning activities. In Sri Lanka, most of the active implementations of Moodle are primarily used to blend with the existing, conventional face to face teaching sessions. Moodle's current versions however, do not fully satisfy our synchronous learning activities at large.

2.5. Live Virtual Classrooms (LVC)

The terminology "Live Virtual Classrooms (LVC)" is a relatively new term. Nantel (2006) identifies that the following names also imply similar products:

- Virtual classrooms
- Live e-learning systems
- Synchronous training systems
- Live online learning systems
- Web conferencing systems

The common feature in any of these products is that they mainly target synchronous learning. The majority of the products are proprietary, and only one product was Open Source (in Beta). The LVC features were sufficient for our requirements (Live Video & Audio, Text Chat, Desktop & Application Sharing). However, the operational model used by most of the LVCs did not provide a facility to host the server locally. These LVC's required the clients to connect to the provider's server – a feature which required costly, high bandwidth internet connections, and monthly payments for the service. As a solution to this limitation of existing products, Halse (2007) had developed a prototype LVC, but such a development was not a viable solution in our situation.

3. The Learning Environment (LE)

The LE accommodated 250 computers over 4 labs. A feature which was integrated to the facility was to accommodate broadcasting of lectures from one lab to another - providing a virtual classroom environment. All Labs were located within a

50m distance of each other. We identified three elements which were essential to the Virtual Classroom Environment:

1.The Lecturer's Voice
This was implemented via separately cabled, Audio Broadcast system consisting of a matrix switch which could enable the lecturer to address any of the 4 labs, or all of them.

2.The Actions Performed by the Lecturer on Screen (Desktop)
This was broadcasted to remote locations using a commercial classroom management software - Net Support School and projected via multimedia projector.

3.The Lecturer's Physical Appearance
The gestures performed by the lecturer was captured using a Standard Video camera and was broadcast to the other labs, via a Video Amplifier.

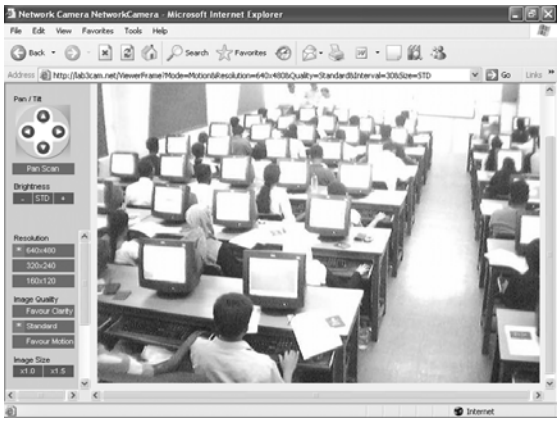

Figure 1 - View of the Remote Classroom

To maintain the interactive nature required in a regular lecture, network cameras with remote pan and tilt to monitor the remote locations was available. (See figure 1). The lecturer could view, and interact with the any of the local or remote student desktops using Net Support School, Software. (See figure 2).

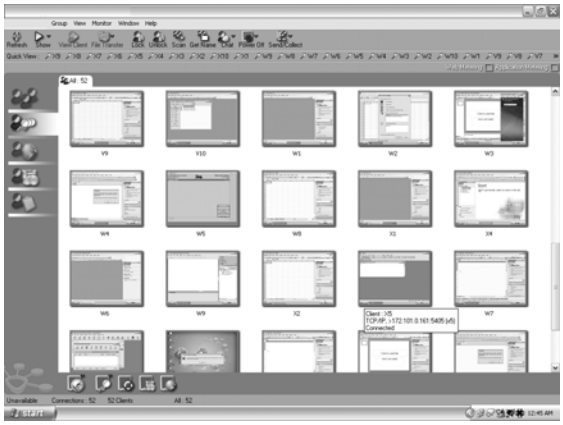

Figure 2 - View of Student Desktops from the Lecturer

The Students had the option to interact with the lecturer during question and answer sessions by using a wireless microphone in each class. The Microsoft® NetMeeting Software was used as a medium to conduct text chat between students and the lecturer. Additionally in each classroom at least one instructor was present, to assist the student – the instructor played the role of a teaching assistant, and coordinated with the main lecturer.

4. Evaluation Approach

Two Courses - in which two specialist application packages were taught - Financial Modelling with MS Excel (Sample A, 70 Students), MS Project (Sample B, 230 Students) were selected as focus groups for evaluation. The traditional whiteboard was not used as a part of these courses. An 8 Item survey instrument was used to gather the information. The survey attempted to determine the students expectation in learner support (The Teacher, Instructor, Technology) in achieving learning outcomes, and the problems faced by students. The data was analysed using SPSS Version 13.0. The response sheet provided room for the students to give their own views. We also

interviewed the Lecturer and Instructors to get their feedback.

5. Results / Findings

a. Composition of the Sample

In comparison, Sample A & B, females compose 62% and 45.7% respectively. The Medium of instruction was English, and 97.2% sample A and 96.5% sample B of indicate they have a Fair or better working knowledge of the language. 72.2% of sample A and 83.9% of sample B consider their usage of computers to be average or better. The response rate was 64% and 85% respectively.

b. Comparison of the Learning Environment (Support) Features

As the final step of the analysis the LEs were compared under each Learning Support Feature for both Samples. The average of the Likert Scale value within each feature was taken into consideration. In both Sample A & B the we observe that the students indicate a sense of satisfaction since all the mean values are above 3.

Table 1 - Comparison of the level of expectation in learner support

Learning Support Feature	Sample A		Sample B	
	With Lecturer	Without Lecturer	With Lecturer	Without Lecturer
Understandability - Screen Explanations	4.33	4.08	3.77	3.58
Audibility of Lecturer	4.46	4.00	3.60	3.50
Visibility of Demonstration	4.11	3.92	3.77	3.66
Physical Presence of Lecturer	4.17	3.83	3.71	3.54
Concentration	4.12	3.80	3.53	3.42
Involvement of Instructors	4.42	4.25	3.86	3.66
Technical Difficulties	3.58	3.42	3.29	3.29
Overall Satisfaction	4.50	3.67	3.82	3.56

The satisfaction levels observed were less in the second group, but in the second group, more students were in the remote location

Based on the additional comments given by students, and the above data, the students in the remote location indicated a lesser overall satisfaction level than in the live classroom for all variables. The Majority preferred to be in a situation where the lecturer was “live”, some had provided reasons for their preference – as one student mentioned, the information was the same, but the lecturer is not continuously observing the remote location, and as such opportunities to pause the lecturer (for clarifications or other requirements) were less in the remote class. However there were comments which were promising as well – as one student pointed out, it is better to be in the front row in the remote location rather than being in the last row of the “live” classroom, as it provides a better screen visibility. The involvement of instructors was important, especially to students at the remote location.

Although the lecturer had access to the individual desktops of students (via Net Support School), this feature was not used heavily by the lecturer, and as such this could have contributed to the students feeling that the lecturer was actively involved with them. This was a welcome solution from the lecturer’s viewpoint, in near perfect solution rather than conducting several sessions of the same subject. Instructor’s comments were indicating no major difference in either environment.

6. Limitations of the Current System and Future Improvements

Analysing the feedback received, the authors list below several limitations of the current system and the suggested remedial actions to be implemented.

a. Capturing movement of the lecturer via Voice Tracking or remote operator.
b. Using a Commercial / Open Sourced LVC Software for Desktop Sharing and Broadcasting of Audio & Video.
c. Demand on Access for the teaching Material. (Via Video Streaming)
d. Capturing of Whiteboard Notes via a electronic whiteboard.
e. Lecturer's need to encourage the remote students to actively participate in the lecture.
f. Increasing the Instructor to Students Ratio in remote classes.

7. Conclusion

In providing computer based instructional training to large groups of students, limited resource footprint is a reality we have to address in the Sri Lankan context. Addressing a large student group can lead to loss of individual attention, while splitting the group can lead to unbalanced delivery between sessions, cost of skilled trainer and other resources. Our approach was aimed at overcoming the associated problems with an economical mindset focus.

The results indicate the students still prefer a live lecturer to the virtual classroom, but generally the students can follow the lesson without major hindrances even from the remote location in the blended learning environment implemented. The only significant additional cost factor in this system lies in the procurement of desktop sharing software. There are no monthly licensing fees, and bandwidth costs. The authors are confident that the system can be further refined to provide an improved LVC Environment.

8. Acknowledgements

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