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Impact of virtual learning for improving quality of learning in higher education

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Abstract

With the evolvement of Information Technology the “Teacher Centered” traditional learning methodology has started to change to “Learner Centered” methodology. As per this change in learning process, the use of technology plays an important role to enable students to engage fully in their programme of study. Higher Education will be changed moderately by 2020 from the way it is at present.

To introduce the “Learner Centered” method, it must meet objective for all the Higher Education Institutes to introduce technological driven educational services to provide the superior learning experience to their students. Services such as Learning Management System (LMS) and Virtual Learning Environment (VLE) are among the newest trends of e-Learning to provide wide range of knowledge and material to their students.

The VLE is an online system or learning platform, which allows teachers to share educational materials with their students via the web. The most common VLEs are Moodle, Fronter, WebCT, Frog, LP+, Blackboard and Kaleidos. On the other hand learners can access the ‘Virtual’ room, as either a duplicate or an extension of their physical classroom. This is a clear advantage for both learners and teachers as they can interact with each other irrespective of where they are located. Every educational establishment should integrate a VLE into their learning process and should allow it to become a global knowledge sharing center.

This paper illustrates an Introduction to the Virtual Learning, main features & impact of the VLE, usage of VLE & LMS through a survey and how to increase the productivity of virtual learning

Keywords: *Virtual Learning Environment (VLE), Learning Management System (LMS), Web-based Learning*

Problem Identification

- As per the UGC (2012) report, 130,000 students are eligible for higher Education.
- Even though there is increasing demand in higher education, classroom learning has become a critical issue due to lack of resources.

- This argument evident that “teacher centered” learning in classroom challenged by “learner centered” learning.

Table 1 is clearly illustrated the competition to enter into public universities in Sri Lanka.

Table1 – Student Performance and Demand for Higher Education

Description	No. of Students
Satisfied for University Admission	130,000
Selected for State Universities	22,000
Apply for External Degrees and Private Universities	108,000
<i>Source: UGC 2012</i>	

Research Question

- What are the different types of “learner centered” learning methods?
- Can “learner centered” methodologies replace with “teacher centered” learning?

Research Objectives

- To investigate different types of “learner centered” learning methods
- To investigate weaknesses of “teacher centered” learning
- To investigate feasibility of “learner centered” learning instead of “teacher centered” learning

Research Methodology

- Sample selection:
 - Three (3) leading higher education institutes in Sri Lanka. (50 Students, 30 Lecturers)
- Data collection techniques:
 - Questionnaire with 15 questions (1-5 Likert)
 - Primary data
 - Activity and Log reports of the Moodle in Horizon Campus on one particular semester in 2016 in faculties of Information Technology, Management, Science, Education and International Programmes.
 - Secondary data
 - University Grants Commission and Virtual Learning Environment of BIT at UCSC.
- Hypothesis:
 - H₀: Virtual learning in the “learner centered” methodology is the best the replacement for “teacher centered ” methodology in classroom learning .

Limitation

- Data collection restricted to one particular semester
- Only five (5) faculties in the Horizon Campus were selected for data collection.
- Two (2) Learning Management Systems were observed (Moodle -Horizon Campus and VLE - BIT, UCSC).

Literature Review

This literature review summaries the background and development of VLEs to support teaching and learning (Barker & Gossman, 2013). It consists with a brief historical background followed by general positive and then negative impacts of VLE use and examines specific impacts of VLEs on independent learning and motivation.

Historical background on the use and development of VLE's is difficult to define exactly how long VLEs have been in use. The UK's Open University has been utilizing computers for learning since the 1970s but it was in 2000 that the commercial computer based VLE 'Blackboard' was patented. By 2010 Blackboard software was used by over 3700 educational institutions in more than 60 countries (Blackboard, 2011). The other most popular VLE, 'Moodle', was introduced in 2001, (Ofsted, 2009). It was originally developed to help educators create online courses with a focus on interaction and collaborative construction of content (Ofsted, 2009) and by 2011, Moodle had a user base in 212 countries with 49,365 active sites in more than 75 languages (Moodle, 2011). In the UK within the post-compulsory sector in 2008-9, 92% of further education colleges had a virtual learning environment; the figure having risen from 58% in 2003-04 (Sero, 2009).

As a result of the UK Government 2005 strategy paper *Harnessing Technology – transforming learning and children's services*, which emphasized institutions and learning providers making more effective use of technology (Becta, 2010), Ofsted reported on a sample of 34 schools investigating the impact of VLEs on students' learning (Becta, 2009). The reports were published between September 2005 and December 2007 and concluded that just over half of the schools surveyed were positive about the impact of VLEs on learning and teaching. In contrast, during the same period 58 FE colleges out of 281 inspected by Ofsted had a VLE and of those three quarters suggested that the use of VLEs were helping learners (Becta, 2009).

It was found that the VLE was still primarily used as a repository for teaching materials and sometimes utilized for assignment uploading with limited use of interactive functions. Less than a quarter of the colleges were using the VLE to support independent learning, however, those that did were confident that technology had contributed to creative teaching providing learners' with access to relevant content; and giving flexibility to delivery.

Due to the high competition among students to enter into public universities and high demand for higher education, one portion of students migrate for their higher studies, some have entered into private universities and the rest of the portion register for external degrees offered by the public universities.

Many external degrees are offered by public universities in Sri Lanka and one of the challenge they are facing is to maintain quality and standards of their degrees. Due to

higher number of students, they are faced many problems such as paper marking and releasing results on time. Online external degrees are able to address this issue up to some extent. To cater for the higher numbers is not that much easy while maintaining the quality and standards.

Bachelor of IT (BIT) degree at the University of Colombo School of Computing (UCSC) is doing a major role to

- produce qualified ICT professionals in addition to the traditional University output
- set professional standards and encourage students to obtain skills in commercial ICT applications and in the usage of necessary tools
- enable those who could not enter the university to read for a degree in ICT due to severe competition to work towards obtaining such a degree
- give an opportunity to those non-graduates already working in ICT to obtain a formal qualification in ICT through self-study.

Online distance mode is the best approach to cater for the large numbers who are in different geographical locations. BIT degree acts a major role in this situation by delivering their lecture material and other facilities through web based Virtual Learning Environment (VLE).

Virtual Learning

In the last 10 years, education has benefited from a real e-revolution. The most schools and universities now have a functioning Virtual Learning Environment (VLE), at the heart of their teaching and e-learning programmes. A virtual ‘shadow’, if you will. A VLE, or learning platform, is an online system that allows teachers to share educational materials with their students via the web. Examples include Moodle, WebCT and Blackboard. For a student to be able to access a ‘Virtual’ room as either a duplicate or extension of their physical classroom is a clear advantage for learners and teachers alike. Every educational establishment ought to integrate a VLE into their lessons and allow it to become second nature to learners and educators outside of the classroom. Here are some reasons why:

- Communication – opens up an infinite number of channels in the format of forums, discussion threads, polls, surveys, instant feedback either as a group or individually
- Producing work – students do not physically have to find their teacher to hand in work due to secure virtual ‘hand-in’ folders that have time windows
- Resource hub – teachers have infinite online storage space for PowerPoint presentations, word documents, worksheets, pdf documents etc. that can either be secure or shared with students
- Dynamic home pages – teachers have the opportunity to create an exciting virtual space to represent their room/subject
- Links to outside sources – pathways to all other online learning spaces are linked

via the VLE

- Embedded content – YouTube, BBC, and newspapers can all be embedded as the dynamic feed of the homepage
- Podcasts & videos – both teacher- and student-produced podcasts and videos have a shared platform; again, either secure or shared

Introduction

Main Features and Impact of the Virtual Learning Environment (VLE)

The use of technology to enhance learning can be an important means to enable students to engage fully in their programme of study. Higher education providers develop technological facilities and services (including virtual learning environments and library systems) that are accessible, inclusive and cater for a wide range of potential student requirements. Systematic consultation with students and staff about the accessibility of technological facilities enhances standards of usability.

Assistive technology can make methods of learning and teaching more accessible to a wide range of students. Wherever possible, assistive technologies are made available to all students through integrated organization-wide systems, rather than through distributed facilities or those targeted at a subset of students.

As technology improves the “virtual classroom” becomes more popular, there is a tendency on the part of institutions and students to turn to online courses. They save resources and can accommodate more students. They are more flexible for busy schedules or commuters. But as these examples demonstrate, the online classroom must be created with the same care and expectations as the traditional one.

Students still crave interaction with their fellow students, even if they cannot see them. Otherwise, the online classroom seems cold and disconnected. To keep students engaged in the material and passionate about the subject matter, therefore, the lecturer must find a way for the students to interact with one another. Discussion forums are a natural solution and can be facilitated by posing questions for students to respond to or as simply a “free for all” for student discussion. The professor must be an active participant and facilitator, however, or students will diminish the exercises’ importance. Another solution is virtual group work. Asking students to collaborate on projects or assignments forces them to meet and exchange ideas with their peers and fulfills their need for group interaction without actually meeting in a classroom.

Students also want diversity in both content and content media, a desire that should not be stifled by the assumed one-dimensionality of online coursework. While most online courses create a class Web site for posting assignments and logging in to take tests, these sites could be used as portals for multimedia exploration. One of the great benefits of the Web is its use of multiple media formats: users can stream video, listen to audio, and peruse photographic archives. It is important to incorporate a variety of formats into the online classroom to keep content fresh and to appeal to the sensory habits of a variety of learners.

The Web-based course, unlike the traditional classroom, is also at an advantage visually. Net Gen learners are more likely to respond to visual images than a form of straight text. From childhood, we are bombarded by images on television, on billboards, in magazines, and on the Web. A quick survey of newspaper evolution reveals the increased reliance on images rather than text to tell the story over time, and Net Gen learners have evolved alongside this phenomenon. To teach the Net Generation, therefore, requires the use of visual images in conjunction with text, a feat easily accomplished through animation and diagrams on the Web.

It's a common misconception that students take online courses to avoid the rigor and workload of a traditional classroom. In many cases, that's simply not true. When students choose an online classroom, they still want to be challenged. They still want exploration. And they still want creativity. Net Gen learners are not likely to excel in an environment where they are simply handed material and expected to recite it. Instead, most log on to online courses because they despise this traditional format of lecture and regurgitate. Instead, they feel they learn better in an environment where they can teach themselves. With that in mind, the online professor must find ways to offer students a method of exploration and research within the curriculum. Students might be asked, for example, to abandon the course Web page to search an archive or journal for information on their own. They might be asked to weave current events within the context of the taught material. Or they might employ their own technical savvy to construct research Web pages or blogs.

Main objective of introducing LMS at the Horizon Campus is to enhance learning quality by enabling lecturers to convey information more effectively and efficiently, by introducing different learning styles for students and encouraging more interactive sessions between students and Lecturers.

Hence, the management of the Horizon Campus has taken a policy decision to introduce a new LMS or VLE to provide lecture/training material through online/web based system. 'Moodle' is a free open-source learning management system or e-Learning platform that serves educators and learners across the globe. By deploying Mobile-ready Moodle platform, Horizon Campus is able to provide its students with the most advanced virtual learning environment facilitating anytime, anywhere learning concept.

For that cloud-based system proposed to provide uninterrupted e-learning facilities to students while hosting all the other IT related services such as library management, student management, etc. Cloud based implementation, installed and configured with an open source operating system and application software, proves that for approximately US \$170 per month.

There are many features available in the Moodle for Students and Staff. These features are mainly categorized in to two (2) as Activities: Assignment, Chat, Choice, Database, External Tool, Forum, Glossary, Lesson, Quiz and Resources: File, URL. Figure 10 illustrates the usage of above mentioned feature of the Moodle in Faculty of IT in a selected semester.

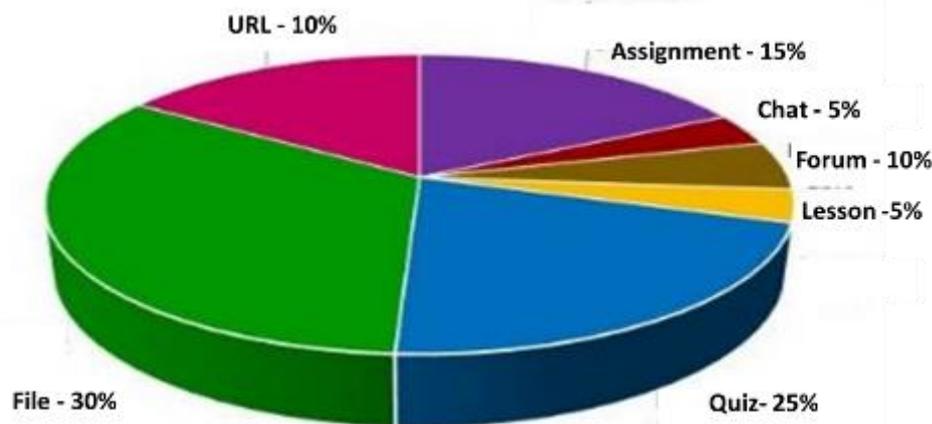


Figure 1 - Overall Use of Features available in Moodle

Some of the Moodle features are not using effectively yet. According to the figure 1, the interactive features such as Chat and Lesson (10%) and Forum (15%) are the least used by the faculty of IT. The students and staff are especially positive about sharing materials (Files-95%), assignments (50%), and online readings (URL – 45%).

Taking into consideration the job opportunities that exist for ICT graduates in Sri Lanka & overseas, the University of Colombo School of Computing (UCSC) took the initiative to launch the External Degree programme leading to the award of Degree of Bachelor of Information Technology (External) – BIT in 2000. The UCSC having the most advanced training resources and experience in Sri Lanka in the field of ICT training examinations leading to the first-ever External Degree in IT in Sri Lanka.

UCSC provides a well-defined detailed syllabus that would help to lay a solid foundation on which, a student can build his career in ICT. The syllabi will be constantly updated to meet the industry requirements. Model and past question papers, a list of recommended textbooks are provided to the students. In the year 2003, e-learning was introduced to the first year BIT students through a Virtual Learning Environment (VLE). VLE assists the students in learning through self-evaluating quizzes, learning material and activities.

Usage of VLE and LMS

LMS can enhance learning quality by enabling instructors to convey information more effectively, helping instructors meet the needs of students with varied learning styles, as well as enriching the interactions students have with each other and with their instructors. That is the promise. However, the students in this study called our attention to performance by noting an uneven diffusion of innovation using this technology. This may be due, in part, to faculty or student skill. It may also be due to a lack of institutional recognition of innovation, especially as the successful use of course management systems affects or does not affect faculty tenure, promotion, and merit decisions.

All the training materials (PPT, PDF) were available in the VLE at the BIT programme in University of Colombo School of Computing. Students can be submitted all their assignment online (except end semester exams). VLE is a well-organized platform with

having online forum to facilitate online debate and there was a separate e-facilitator to answer student's issues, questions and problem immediately.

At the final year project, project progress reports were also submitted through VLE and even final year interim report, dissertation were also submitted via VLE. It was a great experience and even students can access VLE via their mobile phone. Important notices, notifications were directly forwarded to their email as well as mobile phones as text messages (SMS). As a BIT graduate (*Samanthi Wickramasinghe*) I can provide enough proof to show how effective and user friendly of VLE and BIT is the most recognized and well-known external degree which was conducted 90% online in Sri Lanka.

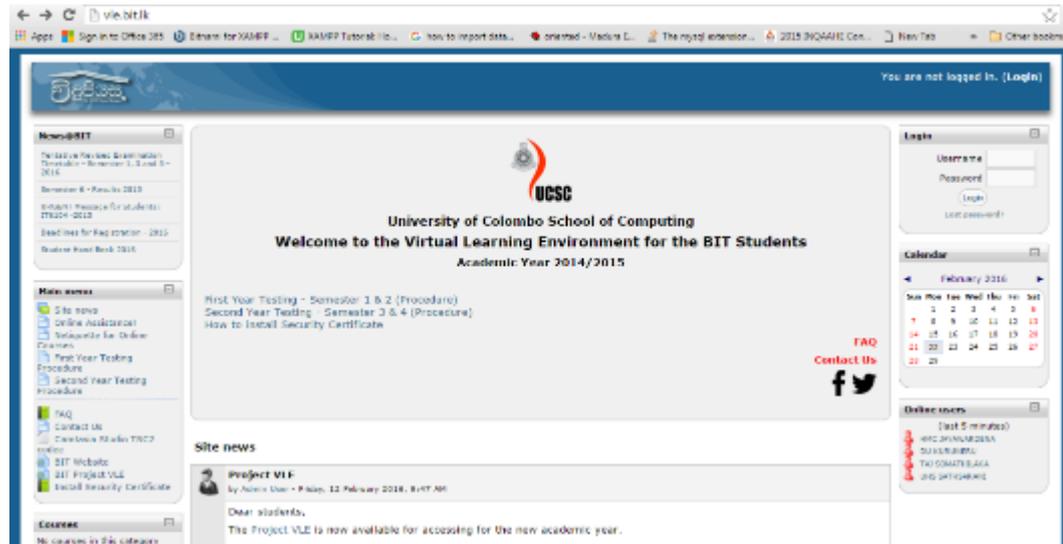


Figure 2 - Interface of BIT VLE

In BIT, VLE has online quizzes and online assignments for each and every modules/courses in a particular semester in a very interactive platform (*kind of MCQs*) as illustrates in figures 3 and 4. Once the students submit their answers, responses/feedback are received immediately. Interactive nature of these activities are increased students motivation.

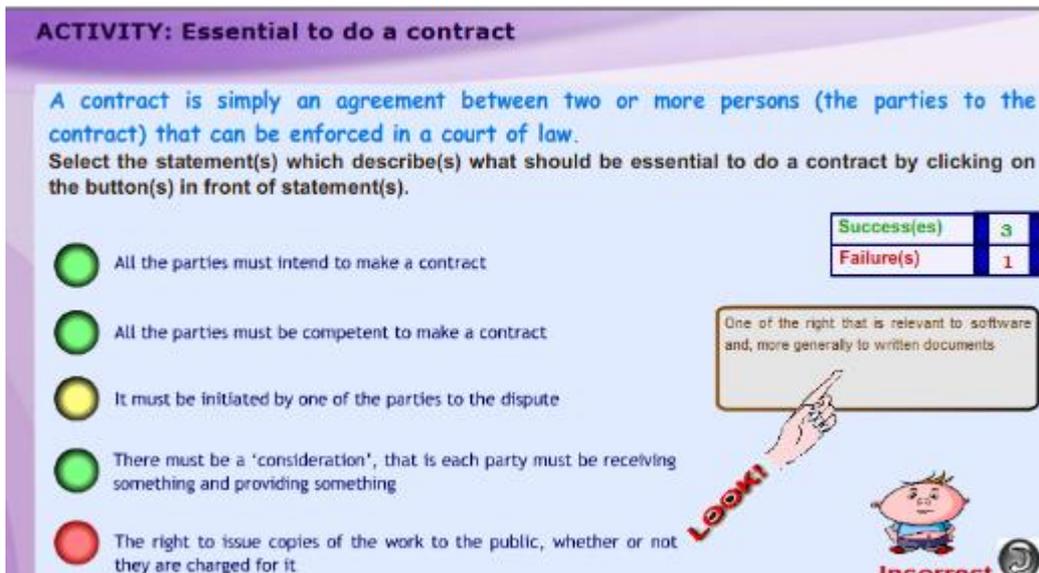


Figure 3 – Online quizzes available in VLE, BIT



Figure 4 – Online assignment available in VLE, BIT

Based on the Activity Reports generated by the Moodle, summarized information on willingness to use Moodle: across different faculties by student is illustrated in figure 5 (Horizon Campus Virtual Learning, n.d.). Willingness to use Moodle is comparatively high among students in the faculty of IT (90%).

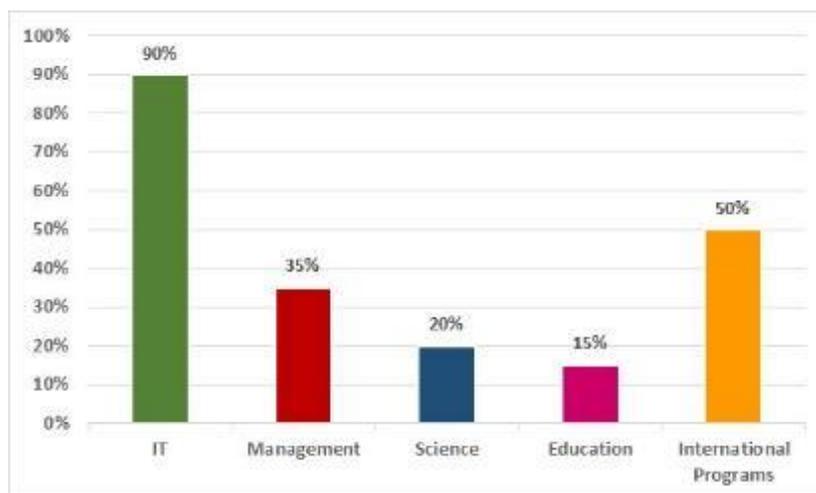


Figure 5 - Willingness to use Moodle: across different faculties by students

The figure 6 illustrates willingness to use Moodle: across different faculties by staff based on the generated Activity Reports.

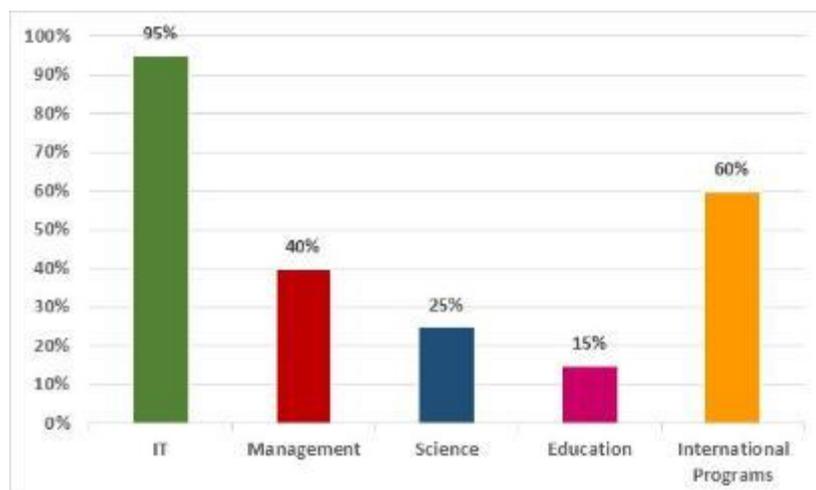


Figure 6 - Willingness to use Moodle: across different faculties by staff

When we compare the above figure 5 and 6, there is a similarity between Students and Academic Staff members of using Moodle in respective faculties. It clearly indicates due to lack of using Moodle by staff in faculties of Education, Science and Management, students are poorly used Moodle in these faculties.

According to the figure 6 clearly depicts, Staff in the Faculty of IT are taking the maximum usage of the Moodle.

An online survey (*Questionnaire form is attached in Appendix 1 and 2*) is conducted among students in the faculty of IT to observe the ‘use of Moodle to encourage independent learning’ and the ‘use of Moodle increases students’ motivation to learn’. (*Likert Scale: 1-Strongly Disagree/5-Strongly Agree*) The survey outcomes are illustrated in figures 7 as below.

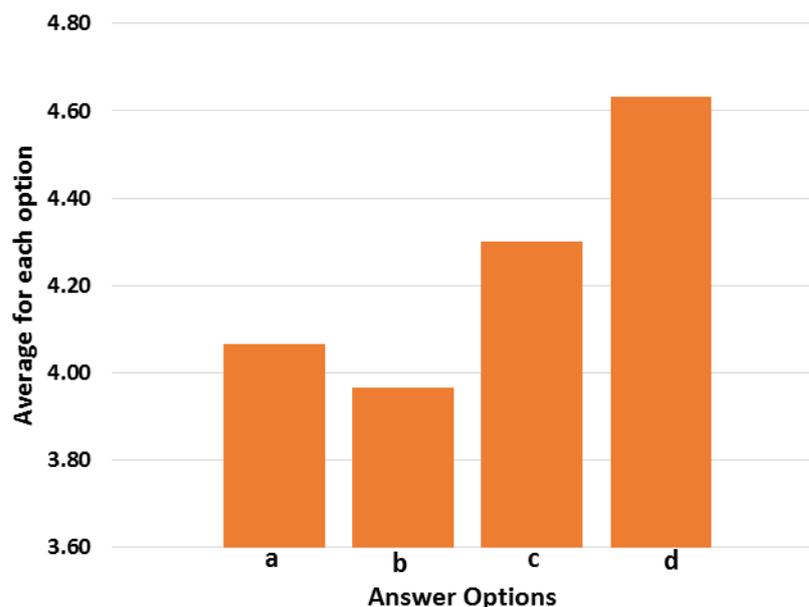


Figure 7 - The use of Moodle to encourage independent learning

According to the survey outcome, the average of 4.63 indicated, encouraged them to talk to other students about the work. The average of 4.07 and 3.97 showed get the opportunity to learn using Moodle at a time, place and pace to suit and encourages them to learn independently and the way in which subject/courses are set up encourages students to learn independently respectively. The average of 4.30 agreed Moodle are mainly for information purpose and generally for their subject resources.

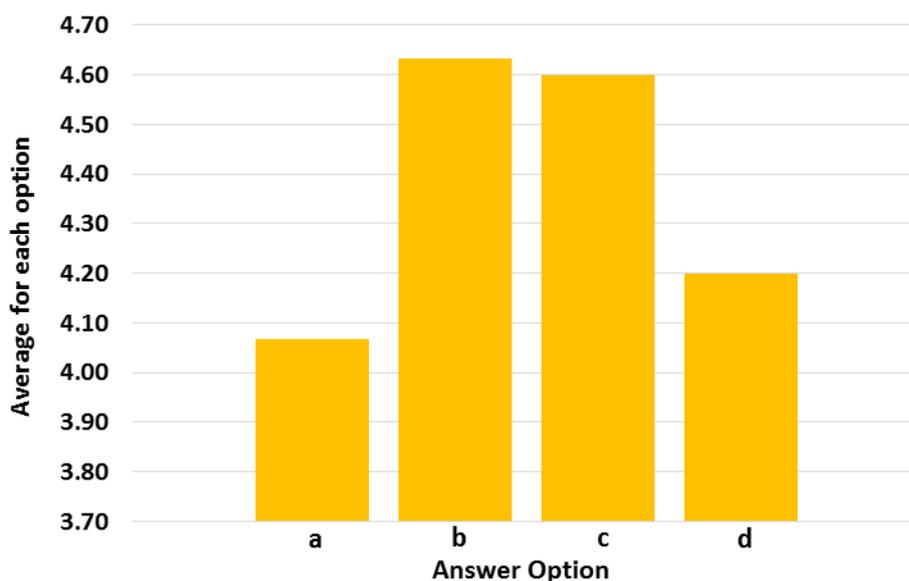


Figure 8 - The use of Moodle increases students' motivation to learn

The above figure 8 depicts the survey outcome of the use of Moodle increases students' motivation to learn. The opportunity to be in control of student's learning via Moodle and learn at a time, place and pace, increases students' motivation to learn indicated the average of 4.07. The most of the students' motivation to learn is the variety of course

tools eg resources, PowerPoints, quizzes, hyperlinks, news feeds, forums, available on Moodle as the average of 4.63. The average of 4.60 indicated the variety of formats available on Moodle eg text, images, audio clips, podcasts, has increased their motivation to learn. Feedback on activities eg. assignments and quizzes on Moodle has increased my motivation to learn is the average of 4.20.

Interesting Adoption to Virtual Learning

- The best e-Learner award: Frequent users of VLE (BIT-UCSC) are awarded during the convocation.
- Active participation can be taken as a criteria for Dean's List

This type of initiations will encourage students to access VLE and increase the productivity of the VLE.

Conclusion

Hypothesis can be safely validated that is virtual learning in the “learner centered” methodology is the best replacement for “teacher centered ” methodology in classroom learning .

Mobile and wireless technologies provide opportunities for learning to become more personal and customized yet collaborative and networked, portable and situated, ubiquitous and lifelong. The rapid development and convergence of media, the read-write Web, and mobile tools and networks are opening up new opportunities for learning by allowing learners to be mobile, connected, and digitally equipped, no longer being tethered to a fixed location by network or power cables, a standardized curriculum, or a bell schedule. It also means that learning and formal education are increasingly at odds, as more and different types of learning are happening outside the classroom than in it. In sum, as our environment is becoming more flexible and unpredictable, so is our learning.

For some time the virtual university was in the focus of interest - a university which stands in competition with the “normal” physical university. Students can learn whenever they want and from wherever they want. Experts from all over the world generate the learning material which is in a digital form and is distributed via the internet. The learning activities are also supported by (tele-) tutors using the internet. The tutors answer questions, discuss the content and help solving problems.

In a Notebook-University the focus changes from a virtual university to a digital campus. The digital campus does not stand in competition with the real campus. It is rather an expansion of the physical campus. The goal is to overcome the gap between the physical and the virtual world.

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University Grants Commission in Sri Lanka: www.ugc.ac.lk

Bachelor of Information Technology: www.bit.lk

Appendix 1: The use of Moodle to encourage independent learning

	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly Disagree
a) The opportunity to learn using Moodle at a time, place and pace to suit myself encourages me to learn independently					
b) The way in which subject/courses are set up encourages me to learn independently.					
c) Generally for my subjects the resources for me on Moodle are mainly for information purposes.					
d) Generally for my subjects the activities on Moodle encourage me to talk to other students about the work.					

Appendix 2: The use of Moodle increase students motivation to learn

	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly Disagree
a) The opportunity to be in control of my learning via Moodle and learn at a time, place and pace, increases my motivation to learn					
b) The variety of course tools eg resources, PowerPoints, quizzes, hyperlinks, news feeds, forums, available on Moodle, has increased my motivation to learn					
c) The variety of formats available on Moodle eg text, images, audio clips, podcasts, has increased my motivation to learn					
d) Feedback on activities eg. assignments and quizzes on Moodle has increased my motivation to learn					