Theme: Sustainable Development of Quality Assurance in Higher Education
Sub-theme: The Internet Generation and its Implication on Higher Education Quality Management (OER, MOOCs, O...
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Sub-theme: The Internet Generation and its Implication on Higher Education Quality Management (OER, MOOCs, Online Distance Courses and Assessment)

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ABSTRACT

Today’s students are changing far more rapidly than the colleges and universities that recruit them. They have a preferred mode of activity and interaction that is not in sync with an educational system that is showing its age. “Net Gen” students are not interested in large lecture halls, preferring informal, and small-group discussion, often through text messaging or e-mail, as a means of gaining understanding of curriculum content. They want a learning space in which they can get to know one another, engage in dialogue, work independently or in groups on projects, get or provide feedback, and, in general, they seek a collaborative environment that fosters understanding and learning.

Traditional Teacher centered teaching methods are going to be obsoleted and at present heavily using Learner centered teaching methods. Many interactive technology including web based or internet based learning and teaching are the main feature of the Learner centered teaching.

By 2020, higher education will be quite different from the way it is today. There will be mass adoption of teleconferencing and distance learning to leverage expert resources. Significant numbers of learning activities will move to individualized, Just-in-time learning approaches. As a result Virtual Learning, Online Distance Learning and Digital Campus concepts will play a major role in higher education system in the world.

This paper consists a comprehensive description of Information Technology in University life, Impact of Virtual Learning, Online Distance Learning, Impact of Learning Management System, IT Services available in the Horizon Campus and Author’s experience in Virtual Learning Environment.

Keywords: Virtual Learning Environment, Online Distance Learning, Digital Campus
1) Introduction

At present the Internet and related technologies have had a major influence on culture and development. Many, if not most, Net Generation students have never known a world without computers, the World Wide Web (WWW), highly interactive video games, and cellular phones. For a significant number, instant messaging has surpassed the telephone and electronic mail as the primary form of communication. It is not unusual for Net Generation to multitask using all three communication methods at once, while still surfing the Web and watching television.

Higher education often talks about the Net Generation’s expectations for the use of technology in their learning environments. However, few efforts have been made to directly engage students in a dialogue about how they would like to see their faculties and institutions use technology to help students learn more effectively.

In many respects, globalization has already profoundly influenced higher education. Globalization is often described as the reality shaped by an increasingly integrated world economy, new information and communications technology (ICT), the emergence of an international knowledge network, and the role of the English language.

The traditional learning process that operated in a classroom between teacher and students has of late developed up to the distance education mode. Under this system the teacher stayed in one place and provided his/her notes and instructions and the students learnt the lessons as required staying in a place convenient to them. There was no need for the teacher to meet the students. Very often distance education took place via the post or telephone. With the development of information technology distance education has become very popular. Although only a few pupils can be served in the classroom, it has to be mentioned that a large number of students can learn at once through e-education which is imparted using multimedia technology.

By now much attention is paid in Sri Lanka to develop e-learning and the necessary infrastructure. For that the University sector (tertiary education) is pioneering in e-learning today and it is likely to expand to the school system (secondary education).

Learning using the computer is called Computer Assisted Learning (CAL). Teaching using computer is called Computer Based Teaching (CBT) while learning using the internet is called Web Based Teaching (WBT). Such learning systems may not be new things to you.

Apart from educational activities, computers are used in school administration too. Use of computers in school administration can easily improve the quality in the field of education.

2) Information Technology in University Life

The 2011 Horizon Report (Johnson, Smith, Willis, Levine & Haywood) includes (in rank order) those trends considered to be key drivers of educational technology adoption in higher education as:
• “The plenty of resources and relationships made easily accessible via the Internet is increasingly challenging us to revisit our roles as educators in sense-making, coaching, and credentialing.
• People expect to be able to work, learn, and study whenever and wherever they want.
• The world of work is increasingly collaborative, giving rise to reflection about the way student projects are structured.
• The technologies we use are increasingly cloud-based, and our notions of IT support are decentralized”.

The 2012 Horizons Report names those technologies most likely to be widely adopted in higher education in the near term as mobile applications and tablet computing. The Educause Center for Applied Research (ECAR) study of university student perceptions of and usage of technology reports are shown in figures 1 (Students & Technology, 2011).

![Figure 1: Student perceptions of technology use at universities (ECAR, 2011).](image-url)
It is important to note that incoming freshmen are more likely to “be even more web-entrenched over the coming years as high schools around the nation are implementing web-based tools” (Smith & Caruso, 2010, p. 77).
A 2010 ECAR study (Smith & Caruso, 2010, p. 9) found:

- The majority of students report convenience is the most valuable benefit of information technology (IT) in courses.
- Roughly 50 percent of respondents believe use of IT in courses improves their learning.
- About 50 percent of students who responded report feeling adequately prepared to use IT as needed in their courses when entering college.
- Just less than 50 percent of respondents feel that upon graduation, the IT they used in their courses will have adequately prepared them for the workplace.
- Virtual learning environments

### 2.1 Information Technology in the Classroom

We expected to find that the Net Generation student prefers classes that use technology. What we found instead is a bell curve with a preference for a moderate use of technology in the classroom (see Figure 1). The mean (3.07), median (3.00), and mode (3) were squarely at the moderate level of preference for technology use on a scale of 1 to 5, with 1 being “I do not prefer the use of technology” to 5 being “I prefer taking courses that are taken totally online.” We found that 30.8 percent of the students preferred taking courses that use extensive levels of technology. Least preferred (2.2 percent) were courses that are delivered entirely online. Nevertheless, 25.6 percent of the students preferred limited or no use of technology in the classroom.

![Figure 4: Student Preference for Use of IT in Classes](image)

The following factors were considered in evaluating students’ preferences:

- Previous experience with the use of technology in the classroom
- Faculty skill using technology
- Hours students use technology
- Perceived levels of skill using computers by the respondents
- Institution
- Major
- GPA
• Demographics

A student’s previous positive experiences in the classroom had a beneficial impact on the preference for classroom technology. It is not surprising that if technology is used well by the instructor, students will come to appreciate its benefits. This may explain why seniors had a higher preference level for the use of technology in the classroom than did freshmen.

Table 1 – Preferences for Technology by Major Disciplines

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Prefer No Technology</th>
<th>Prefer Limited Technology</th>
<th>Prefer Extensive Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>4.8%</td>
<td>24.4%</td>
<td>67.8%</td>
</tr>
<tr>
<td>Business</td>
<td>1.3%</td>
<td>28.2%</td>
<td>64.3%</td>
</tr>
<tr>
<td>Life sciences</td>
<td>4.8%</td>
<td>35.3%</td>
<td>56.3%</td>
</tr>
<tr>
<td>Physical sciences</td>
<td>5.7%</td>
<td>40.9%</td>
<td>51.8%</td>
</tr>
<tr>
<td>Social sciences</td>
<td>7.9%</td>
<td>44.4%</td>
<td>44.2%</td>
</tr>
<tr>
<td>Education</td>
<td>3.5%</td>
<td>47.9%</td>
<td>42.9%</td>
</tr>
<tr>
<td>Humanities</td>
<td>7.7%</td>
<td>47.9%</td>
<td>40.2%</td>
</tr>
<tr>
<td>Fine arts</td>
<td>9.0%</td>
<td>46.9%</td>
<td>39.3%</td>
</tr>
</tbody>
</table>

Perceived Benefits

We asked students about the perceived benefits of using technology in the classroom (see Figure 3). The most cited benefit was convenience (48.5 percent). In the survey’s open-ended comments, 134 students voluntarily identified convenience as one of the primary benefits of using information technology in classes. When convenience was combined with saving time, the percentage increased to 64.6 percent. Only 12.7 percent said the most valuable benefit was improved learning; 3.7 percent perceived no benefit whatsoever. Note that students could only select one response, so more than 12.7 percent may have felt learning was improved, but it was not ranked highest.
top six benefits of the current implementation of IT as

- improving work efficiency,
- affecting the way people behave,
- improving communications,
- making life more convenient,
- saving time, and
- improving learning ability
3) Impact of Virtual Learning.

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.

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

As technology improves and 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, therefore, 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.

3) Online Distance Learning

Distance education is the popular option for nontraditional learners. Distance education through Internet and video courses—helps those who have to work a job and go to school at the same time better schedule their learning opportunities. These people are usually older, in their 30s or 40s, and are learning to use technology, like the Internet and computers, while training for a new career. In theory, the Net Generation should learn better through Internet courses because they have been surrounded by computers all their lives and know how to use the technology already.

Just the opposite is true. Net Geners like the social interaction that comes with being in class with their peers. While they may use technology in their daily lives, relationships are a driving force in the learning process.

Many futurists agree that online learning is the disruptive innovation in higher education today (Christensen & Eyring, 2011). A disruptive innovation is one that allows a simple, affordable, and accessible product to replace a product that is complex, expensive and inaccessible, even if the initial quality of the new product is inferior. Disruptive innovations have led to the downfall of many successful companies that did not recognize the potential impact of the innovation. Among the reasons online learning is expected to transform teaching and learning in higher education today includes:

- Online learning is less expensive to deliver than classroom-based education because it does not require physical plant.
- Online learning is accessible 24/7 to learners anywhere in the world.
- Online learning also appeals to the Net Generation’s unique needs and expectations in a number of ways.

According to the report, 2010 Class Differences Online Education in the USA, (Allen & Seaman, 2010):

- Sixty-three percent of all reporting institutions said that online learning was a critical part of their institution’s long-term strategy.
- The 21 percent growth rate for online enrollments (to 5.6 million in the fall term of 2009) far exceeds the less than two percent growth of the overall higher education student population.
• Nearly 30 percent of all students in higher education take at least one course online.

• Studies have found that the quality of student outcomes in online classes is comparable to that of face-to-face courses (Allen & Seaman, 2010; Brainard, & Richards, 2010; Dziuban & Moskal, 2010).

The 2010 Educause Center for Applied Research (ECAR) study of undergraduate students and information technology found that of the nearly 37,000 students surveyed, 90.3 percent had used a course or learning management system and 35.2 percent use one daily (Smith & Caruso, 2010).

3.1 e-books
The growth of digital textbook sales is expected to increase significantly in coming years, fueled by (Reynolds & Loffe, 2010):

• Increased growth of online learning
• Rise in open educational resources and their use
• Proliferation and continued popularity of e-reader devices and platforms

This growth is expected to also create opportunities for new content-publishers to enter the textbook market and accelerate the formal adoption of open educational resources to supplement premium digital content.

4) Impact of Learning Management System (LMS) Use

Students were asked whether they perceived that a particular tool within a LMS improved learning, whether it improved class management, or whether it improved both learning and class management. Students were also given the option of reporting whether a tool had no effect on either learning or class management, or whether it had a negative effect. Classroom management (convenience) scored highest, followed by improved learning. Negative perceptions were minimal.

The interactive features least used by faculty were the features that students indicated contributed the most to their learning. The students were especially positive about sharing materials with students (38.5 percent), faculty feedback on assignments (32 percent), and online readings (24.9 percent).

Features considered to improve class management included track grades (45.7 percent), online quizzes (38.5 percent), online readings (29.1 percent), and sample exams online (21.2 percent). All other features received less than a 20 percent response.
When combining the percentage of students who said that the LMS improved both learning and class management, sharing materials with students was ranked highest (52.8 percent); tracking grades was second (47.9 percent). Fully 80.3 percent said that tracking grades improved their ability to manage their classroom activities as well, when combining the percentage of students who said that the course management system improved class management and both improved class management and learning.

### 4.1 Potential of Learning Management Systems

LMS and their implementation are a work in progress. They promise to significantly reduce the restrictions of time and space on learning for students and faculty, in much the same way their predecessor enterprise administrative systems did for student administrative services. Used properly, they have the potential to greatly improve student access to information and to communicate with their instructors, enhance the quality of learning, and increase learning productivity.
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.

5) IT Services in the Horizon Campus

a) Horizon deploys Microsoft Office Cloud 365 Cloud Service

The Horizon Campus deployed Microsoft Office 365 based cloud services enabling all faculty and students to access outlook web app and associated software online. The cloud comes with Exchange Server, SharePoint Server and Lync Infrastructure with desktop office software in which all Microsoft office packages can be used online. With Office 365 in the cloud, all patches, updates and upgrades happen in the background without the campus needing to worry about it and without any of the headaches of updating and maintaining it all.

Office 365 applications are accessed through 128-bit SSL/TSL encryption so that if a transmission is intercepted by someone without authorization, they won’t be able to read it. Antivirus signatures are kept up to date, and security measures are applied automatically. Further, Exchange Online uses Forefront Online Protection for Exchange (FOPE) to protect mail messages from malware, and it uses anti-spam filtering and antivirus with multiple virus engines. The Exchange Online gives the campus the benefits of Exchange Server 2010 without the cost and overhead of deploying it in-house. User mailboxes up to 50 GB and attachments up to 25 MB are supported with personal archives provide more storage space.

Deploying Microsoft Office 365 cloud, which provides enterprise-class reliability and security, at the Horizon Campus will certainly add quality and relevance to all its academic programs.
b) Learning Management System – Moodle

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.

Figure 7: Horizon Campus Virtual Learning Interface

Figure 8: Online Assignment Submission through Moodle
c) Student Management System

Fedena is a multipurpose campus management software which is used by thousands of educational institutions worldwide for all administration, management and learning related activities. Deploying Fedena in the Cloud enables Horizon to manage students, teachers, employees, courses and all the systems and processes related to running academic activities efficiently.

d) Library Management System

Horizon Campus has deployed Koha, the open source integrated library management system (ILS) giving enterprise-class and comprehensive functionality including basic and advanced options to manage the library. It includes modules for acquisitions, circulation, cataloging, serials management, authorities, flexible reporting, label printing, multi-format notices, offline circulation for when Internet access is not available, and much more.

6) Experience of Virtual Learning

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.

Further support is given to BIT students through video content available on YouTube (http://www.youtube.com/user/admtc). Recommended text books have been made available in many public libraries throughout the country in response to student requests.

I got through BIT, external degree in 2013 successfully while working. All the training materials (PPT, PDF) were available in the VLE. We submitted all our 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 we can access VLE via our mobile phone. Important notices, notifications were directly forwarded to our email as well as mobile phones as text messages (SMS). As a BIT graduate I can recommend 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 10: Interface of BIT VLE](image)

### 6.1 Best e-Learner Award

This will be awarded at the DIT/HDIT awards ceremony for the candidates who obtain Diploma and/or Higher Diploma at the first attempt based on their performances at the VLE assessments and active participation in the VLE forum discussions in each of the four semesters.
CONCLUSION

By 2020, higher education will be quite different from the way it is today. There will be mass adoption of teleconferencing and distance learning to leverage expert resources. Significant numbers of learning activities will move to individualized, Justin-time learning approaches. There will be a transition to "hybrid" classes that combine online learning components with less-frequent on-campus, in-person class meetings. Most universities' assessment of learning will take into account more individually-oriented outcomes and capacities that are relevant to subject mastery. Requirements for graduation will be significantly shifted to customized outcomes.

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 this scenario it is not necessary that the students come to a real campus.

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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