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In the context of teaching and learning, both students and teachers give and receive feedback. A course should provide a non-threatening environment where students can express themselves to the instructor and other students. Students need continuing and timely feedback about their work and their performance. Using effective feedback helps ensure that students’ needs are being met and that they engage in high quality learning.

The focus of this paper is to explore formative feedback where the main purpose is to instruct and help the learner have a greater opportunity to learn in the future. Examples, lessons learnt, and best practices are included from the author’s experience of teaching online, and from nearly 200 online teachers. This paper is mainly concerned with providing feedback to students, and as such, feedback is a response to a learner’s work or activity that helps the learner understand more clearly his or her progress, or serves to help the learner improve his or her learning or performance. This can be communication between the instructor and the student, among the students, or self-reflection and self-evaluation of the student in terms of his or her strengths and aspects related to improvement regarding learning activities. To be effective, feedback provided to students should focus on closing the gap between the student’s present thinking or performance and the desired goal. Ongoing formative assessment should be undertaken during the course or the programme.

Introduction

As online instructors we are constantly seeking to improve our students’ learning experiences. After a number of conversations around the topic of providing feedback to students, we decided to elicit the experiences of a number of other online faculty. Their comments illustrate the points made in the following paper.

Providing Effective Feedback Online

Feedback can be defined as “1) the return of a portion of the output of a process or system to the input, especially when used to maintain performance or to control a system or process, or 2) the return of information about the result of a process or activity; an evaluative response” (American Heritage Dictionary, 2000). In essence, feedback in the context of this paper, is the student’s outputs returned to them, with an evaluative response. This output from the student can be “verbal”, as in their participation in discussion, or in any of the traditional forms of recording output used for the assessment of student learning (essays, papers, reports, portfolios, spreadsheets, presentations etc.). The evaluative response can come from other students, or the instructor, or both, depending on the design of the course. Feedback, in this sense, is a communication to the learner, regarding the extent to which they are meeting the learning outcomes of the course. Formative feedback is designed to assist the students to adjust their progress towards the learning outcomes; summative feedback tells them the extent to which their final performances met those outcomes. When using summative feedback for motivational purposes, it is often most effective when given immediately after the performance, test, quiz, etc.

Obviously not all responses to students meet our definition of feedback and this is sometimes confusing to instructors. For instance, we have heard an instructor talk about “feedback” as being the part of her syllabus in the sections that stated her expectations for the course. While providing critical information for students, this is not feedback since at that time most students read the syllabus, they have not produced any products on which feedback can be given. We have heard other instructors refer to their FAQ (frequently asked questions) file as feedback. It is a communication with students about the course and its content, but it is not feedback in the sense used in this paper. Many instructors believe that showing warmth, a personal touch, sympathy, empathy, being humane, and having an
enjoyable course provides the student with valuable feedback on their learning. But these are faculty initiated behaviors and states of mind, independent of any outputs from the students. Attempts at connecting people or building community, or activities that show respect for the individual, can be very important and can occur while giving feedback, but since they are independent of student effort and outputs, we would not call them feedback.

**Summative feedback**, is generally an evaluation of assessment data collected at the conclusion of a learning activity or term such as a quiz or test, and has as its main purpose, an indication of the degree to which the major instructional outcomes were mastered by the student. A prime example is final grades for a particular course. Summative feedback or evaluation may be used to address: 1) student reaction, 2) learning gains, 3) performance changes, 4) education system changes, and 5) impact on the greater society (RWK Enterprises, Inc., n.d.).

The focus of this paper, however, is to explore the role of **formative feedback** where the main purpose is to instruct and to help the learner have a greater opportunity to benefit from and succeed with subsequent learning within the ongoing learning term. Ongoing **formative assessment** should be undertaken during the learning event, term, course or program. The challenge for online learning facilitators is to find ways to actively clarify, and then challenge learners’ ideas, providing them with feedback on progress, while also leading them to the next learning step. The learner can use formative feedback to revise and correct learning gaps and misconceptions. The teacher is able to use the results of formative assessment to adjust content and activities to better meet the learning needs of the students (New Zealand Council for Educational Research 2004).

**Feedback in Learning**

The benefits to be gained from feedback are potentially profound:

Both Hattie (1999) and Black and William (1998a, 1998b) suggest that the average effect size, for feedback on student achievement ranges between 0.4 and 1.0, depending on the type of feedback. For example, comparing the results of some 180,000 studies, Hattie found that diagnosis feedback (pointing out student errors) had an average effect size of 0.52, while corrective feedback (pointing out errors and suggesting how they might be overcome) had an effect size of 0.92 (University of Otago, 2001, p. 3).

Feedback can have such a strong influence on a student’s learning that it lead Hattie (1999) to state that it is “the most powerful single moderator that enhances achievement” (p. 13). This is borne out by our observation that students are anxious and eager for feedback in online courses. They cannot see their peers and have little communication with them, against which to gauge their own progress.

**Feedback for motivation**

Feedback to students needs to be specific, not general and it should reward appropriate performances. The instructor’s interest and attention, encapsulated in specific feedback directed at the students’ outputs, can be perceived as a “reward” and increase the likelihood that students will spend more time on the task. Feedback with motivational intent raises a positive expectancy in the student that they can succeed, and recognizes their dedication and hard work, providing positive reinforcement and creating an intrinsically rewarding feedback loop (Keller & Suzuki, 1988).

My feedback intends to be motivational, even if not obviously so, and most of it occurs in the course conferences. I rarely directly contradict anyone’s contribution. I may add an additional perspective, raise a question, or suggest that the contributor examine some readings or issues they have overlooked. I never tell someone they are wrong, since I wish to encourage conferencing activity. However, I do compliment students for especially insightful
contributions. There is one exception to this: I will criticize a contribution that is merely a summary -- e.g. a regurgitation of the readings. As a constructivist, I wish to encourage students to be effective meaning-makers through the creation of thoughtful responses to the various course materials.

Feedback to clarify and facilitate learning

Students need formative feedback throughout the course to guide their learning. This requires careful design of instruction and the development of activities, discussion, and projects that encourage student-to-student interaction, as well as strategic use of teacher time to provide feedback. Online tasks, tests, and quizzes can also be useful in giving students a picture of their learning progress (New Zealand Council for Educational Research 2004; University of Otago, 2001).

With the diversity in most classrooms today, how does the instructor provide for relevant, specific, timely, valuable, and accurate feedback? Each of these aspects needs elaboration. (Muirhead, 2002; Rankin, 2004; RKW Enterprises, n.d.).

Relevant - The feedback given to the student must be relevant to that person’s career, mission, goals, objectives, or tasks. This requires that the learning facilitator know the student well enough to be able to provide such feedback. This process can be initiated by encouraging the students to introduce themselves in their online courses and by providing trigger questions to elicit the kind of information that will be useful in framing future feedback. One online instructor reinforced this by stating that:

[There isn’t any feedback that will] work in all cases. For example, it is a waste of time using Russian when speaking to an Englishman, unless he understands Russian. The answers I give are dependent on the student’s style of communication, his or her personality, his or her belief systems and what the feedback is about.

Specific - Feedback that is specific gives the learner an indication of where he or she has taken a right or wrong direction. Specific feedback clearly informs the student that the instructor is paying attention to them and has an interest in performance of their learning activities. An example:

For knowledge check questions embedded in the course, I remediate/reinforce immediately, for example:

- You are right! Increased competition usually results in a lower cost.
- That’s not correct. It is increased competition that usually results in lower costs. (I don’t mention the incorrect choice so the learner remembers only the correct choice.)
- That’s partially correct. Knowing your BATNA (Best Alternative To a Negotiated Agreement) is a key element in a negotiation (reinforces what the student had correct), but knowing the other side’s BATNA is equally important (remediates the missing part).

In many cases, especially with more knowledgeable learners, what may be even better is to both acknowledge the student’s contribution and also stimulate further discussion (Ko 2004a; b). An example is, “Geraldo and others have made the point that leadership is important in strategic business planning, but has anyone found in their reading any research to support this?” Students often find engagement in discussion with the learning facilitator to be highly motivating.

Timely - Providing feedback that is timely is consistently found in the literature and practice to be critical to effective instruction. This does not necessarily mean immediate in all cases—especially for
formative feedback. When formative feedback is used for instructional purposes, it is usually most effective when given immediately before the next performance (Tosti, 1978, 1986).

One thing I have discovered after 15 years of teaching online is that promptness is the key to good feedback. Distance students are involved in many things and have busy lives. When they turn in a paper or post on-line, they are thinking about the topic at hand and open to feedback for a couple of days. Beyond that period their minds are on other things and the feedback has less-to-no value. My rule is two-day turn around if at all possible.²

Valuable – For feedback to be effective it must be internally valued and found rewarding by the student. Students value feedback that indicates a genuine interest on the part of the learning facilitator.

I also use metaphors in order to associate the new, to something old that the student(s) already know(s). An online course differs from a "normal" class but not so much to be treated differently.²

Accurate - If feedback is inaccurate, the learner may perceive the instructor or other person giving the feedback does not care about the situation, or lose confidence in the ability of the instructor. Inaccurate feedback indicates a lack of knowledge, and that usually leads to negating any positive benefits of accurate feedback.

I am prompt and give blunt feedback. That which is fact deserves to be corrected (if necessary with reference). That which is opinion needs to be stated as such perhaps with suggested readings.²

**Relationship between feedback and student practice**

It is important to build ample practice opportunities into learning experiences (Zull, 2004). Teachers need to provide specific feedback about the connections learners are making between their existing knowledge and the new ideas and skills they are developing. In designing and introducing elearning components of programs, teachers will need to consider what, when, and how formative assessment will take place, and how they will use information from formative assessment to guide their teaching (New Zealand Council for Educational Research, 2004).

**Relationship between feedback and assessment**

Broadly defined, assessment includes all activities that teachers and students use to obtain information that guides changes in teaching and learning. Thus, assessment includes teacher observation, classroom discussion, and analysis of student work. Assessments become formative when the information gathered is used to meet student needs (Boston, 2002) and to allow the student to direct the course of their learning to meet the objectives of the instruction.

Specific comments about errors in processes students are using and suggestions for improvement, encourages students to focus their attention on the task rather than only on getting the right answer (Bangert-Drowns, Kulick, & Morgan, 1991; Elawar & Corno, 1985). This type of feedback is most helpful on tests and homework and may be particularly helpful because it emphasizes that students can improve as a result of effort, rather than feeling doomed to low achievement due to some presumed lack of innate ability. Formative feedback often helps support the expectation that everyone can learn successfully and counteracts the cycle in which students attribute poor performance to lack of ability and, therefore, become discouraged and unwilling to invest in further learning (Boston, 2002), losing the motivation to attempt more learning.
Peer feedback

What is the value of online student peer review, evaluation and feedback? Is learning how to assess peers’ work a practical skill for the learners? Students evaluating each other's work and offering substantive comments and suggestions (formative feedback) regarding the quality of that work is usually a learning activity itself. The instructor can even grade students on the quality of their feedback. Being able to evaluate is a high form of thinking. Creating a criteria rubric for students guides their comments in an appropriate way. However, in most cases the grading should be administered by the teacher (Guillot, 2003).

Some teachers are overwhelmed by discussions and feedback. What faculty need to know is how to craft an online discussion and offer feedback. For example, in my online writing course, students are not allowed to send their paper to me directly. They must send it to their peer editing group and get their feedback first. When they have done 3 edits of their paper with feedback from their group, then they can send me the paper for my feedback.²

Given the value placed on the acquisition of higher order thinking skills, such as evaluation, it is important that learners engaged in these activities receive timely, formative feedback. Additionally, it is important that students corroborate, dispute, and discuss their constructed knowledge before misconceptions are built. High student to teacher ratios make alternative, effective sources of feedback besides the teacher necessary (Doiron, 2003).

Self-feedback

Self-assessment and reflection are vital components in learning (Berge, 2002). Feedback, especially regarding assessment, will not be effective unless students accept that their work can be improved. Self-monitoring is a key element in the professionals’ work. If a goal is for students to become professional learners and professionals in their fields, we should actively promote self-assessment. As students are asked and encouraged to critically examine and comment on their work, assessment can become a part of a dialogue they expect and can contribute powerfully to their educational growth (University of Otago, 2001).

Dewey defined reflective thought as “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends” (Dewey, 1933: 118). Students can be encouraged to closely examine the state of their current learning, and when comparing their present state with the learning outcomes, determine, for themselves, how much further they need to go. When reflection is engaged in with others, it allows students to adjust their frame of reference. Reflection can also engage the student’s emotions in their learning process. They can “recapture their experience, think about it, mull it over and evaluate it” (Boud, Keogh & Walker, 1985: 19), thus providing feedback for themselves on their current learning.

Opportunities for self-assessment and reflection occur more than first impressions would suggest. Of course, a reflective journal is an obvious, structured opportunity, as are short essays assigned at the end of a learning term where the students can write a short “then–now–next” essay. The students note where they were in the course of their learning at the beginning of the learning term, where they are now, and how they plan to apply their new learning in their lives. Sometimes other occasions that are not as obvious can be found, such as :

When a student asks what their Discussion Board grade is, I refer them back to the grading rubric and ask them to self evaluate and then I will comment.²
Lack of time

Kearsley (2000) expresses the problem this way: In a class of 30 students, assume an instructor spends at least 20 minutes per student evaluating assignments and providing feedback each week. Therefore, the instructor is spending 10 hours per week on the one course. This is without counting the time spent moderating discussion forums, or for such things as preparing course materials, learning to use new software, and troubleshooting problems. So how can an instructor provide feedback without the process consuming their lives? Compose your comments in a word processor, save them and then reuse, refine and re-cycle, adapting general comments to each particular student. As mentioned above, providing clear assessment criteria or rubrics for self-assessment, to which the students can be re-directed can also save time. Learning to weave comments in online discussions by combining elements from several posts, and asking the next question acknowledges each contributor without having to compose a separate response to each one. Providing model answers also helps the student to assess their own work when they can see examples of the responses expected of them.

Aligning Feedback/Evaluation, Learning Goals, and Learning Activities

Essentially, the secret to designing successful learning is to align three elements: 1) learning goals, 2) learning activities, and 3) feedback and evaluation (see Figure 1). This is true whether the instruction is designed and delivered from a constructivist or a behaviorist perspective, or if the learning is done completely online, in-person, or in a blended environment. Blended or hybrid environments require careful attention to media characteristics and to the use of the most appropriate delivery system, including in-person, if called for. The appropriateness of a delivery system should be based on the benefits of each medium, the course content and the needs of the learner, not on the convenience to the designer or instructor. This places the focus on learning and the learner, rather than on instruction or teaching.

Along with the three key elements shown in Figure 1, let me quickly note that the learning process occurs, among other things, within a particular infrastructure, it relies on support services from the organization, and exists within a learning environment created for the purpose of learning. Appendix A provides an activity that may be useful when designing student practice for providing feedback.

Conclusions

Feedback is an important way to illuminate the learning paths for students. There are key elements that instructors can do to provide effective feedback. Before feedback is provided, at least three things can be done to make it’s positive reception more likely:
- Environment that builds confidence, trust, and community feeling;
- Align goals, activities, and evaluation and make sure students understand them;
- Set clear expectations.

All feedback should be given at the right time: generally formative feedback is most effective immediately before the next performance. While giving feedback, as part of direct instruction, the more cues and prompts that can be given regarding the right answers, the more help will be provided.

Provide students with the opportunity to continuously provide outputs, so that the feedback will tell them where they are, where they are going (goals) and prompts them on how to close the gap. This strategy keeps the students involved in the learning process, with a bright hope of successful accomplishment. When the learning activities are not as structured or direct, alternative assessments and feedback are used. That is, when authentic learning is the goal, students are given frequent opportunities to display their depth of knowledge, critical thinking skills, connections to daily life, and both individual and group activities (Muirhead 2002).

References

Berge, Z.L. (2002). Active, interactive, and reflective elearning. The Quarterly Review of Distance Education. 3(2), 181-190.


Appendix A

An example activity to start students thinking about feedback is given as follows. It is flexible in how much the teacher provides for the students in the way of the case study and suggested readings. The idea is to have students ponder a vignette that they create or that is provided to them. After reading tips on feedback (again, that the student finds or that is provided to them), the activity is for each student or group of students to find applications of the tips for feedback in the vignette.

Some tips for providing feedback to students:


Case Study

I use an integrated feedback model in my online classes for the weekly assignments (some assignments are individual and others are team assignments). That is, I construct my feedback sheet based on all the responses received on time. In part, I do a kind of content analysis of the responses (e.g., so many people said this, so many said that) using excerpts from selected responses to represent a position (naming who said it if it was a good example). In some cases I’ll represent a position of a student with which I disagree, stating my reasons, but not saying who had that position (e.g., "One student said..."") I also relate the responses and my assessment back to the content as presented in the course. In situations where a particular position was not presented by any of the current student responses, I’ll mention or quote positions taken by students in previous classes saying something like "In a previous class, one student said..." The feedback sheet usually ends up being five or six in-depth pages. The feedback sheet is sent by e-mail to all students who submitted a response on time or were an active contributor to a team response. The same feedback sheet is sent to the remaining students if and when they do post their responses, but it of course does not represent their submissions. They know that will be the case when they are late and it is just one of the penalties for being tardy or not participating.

I use this integrated feedback process for a number of reasons. First, it helps the students see the big picture on their assignment (e.g., how other people “attacked” the assignment). Second, students get more in-depth feedback (e.g., 5-6 pages) individually on a given assignment than if the instructor provided individual feedback to each student (often, just a paragraph). Third, it actually takes less time for the instructor to prepare, especially after he or she had conducted the same class a number of times. That is, for any given assignment, about half of the feedback sheet is derived from ones used in past classes and the other half is customized to the particular group of responses from the new class. It usually takes me two-to-three hours to construct the feedback sheet for a class of 30 students. If I spent the same period of time providing individual feedback, I would be able to devote a maximum of six minutes to each student in a class of 30. In course critiques, students invariably mention the feedback they received as a positive attribute of the course. If a student requests individual feedback for any assignment, I would provide it. But the requests for individual feedback are rare and never twice by the same student.1

1 Tests for significance can determine if an instructional practice makes a difference at all, but for purposes of comparing alternative approaches, it is important to know how much difference to expect. Effect size can be expressed in several ways, a common one being as a proportion of standard deviation. For example, if students take a test with a standard deviation of 100 and those who prepared using computer-assisted instruction (CAI) score an average of 30 points higher than those who studied using a conventional text, we would say the effect size of CAI was .3. Current research standards call for reporting effect sizes on any quantitative study. This allows readers to gauge whether results have practical importance as well as statistical significance, and also allows other researchers to conduct a meta-analysis to compute an average effect size for similar studies. According to meta-analyses reviewed in CARET, average effect sizes of successful technology-based

2 We wish to thank the many online educators who responded to our email correspondence with their ideas about, and examples of feedback. These persons include those whose quotes are used throughout this article (in alpha order): Jay Alden, Lance C. Beste, Betsy Frank, John Hughes, Gail Kelley, Lucy MacDonald, Ralph A. Miller, and Jim Rawson.
MOBILE TECHNOLOGIES AND THE FUTURE OF GLOBAL EDUCATION

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Optimism for the future lies on the diminishing “cost” of the production and dissemination of knowledge. This must be differentiated from the “price”. The cost reductions are based on the increased power of technology and the expansion of the possibilities of human thought due to digital technologies and telecommunications. The fact that the price is not being reduced and is sometimes in fact going up in spite of the cost reductions is a political/economic problem that must be resolved. This is not easy as the prices are all too often subject to control by monopolies or global consortia or even artificially kept high by governments. It is a sad fact that even as average incomes are rising due to productivity gains, the median incomes are dropping. This is having a particularly negative effect on developing countries, but is also apparent in much of the developed world.

The major technological trends supporting the view that “equal” or “free” education is becoming possible are those involving the new mobile devices: digital divergence – the growth in popularity of dedicated wireless devices for transmitting information; combined with digital convergence – the growth of all purpose devices where the cell phone is no longer just for speaking, but also for text messaging, photography, radio, even digital TV, web browsing, etc. So, the possibility is there to vastly increase access to learning, but that does not mean that this will happen automatically. There are many obstacles. These aspects have been critically examined in this paper.

Five laws

Significant trends or “laws” in telecommunications and computers are also driving down costs. The first is Gilder’s Law, where George Gilder has noted that the costs of telecommunications are dropping drastically with digitalisation. The costs of high bandwidth Internet connections and long distance telephone calls are on a consistent downward trend, with no end in sight and at a rate three times faster than the drop in the costs of computers (Gilder, 1990). Unfortunately, for some although the costs are going down for the Telcos, the prices are not. With growing competition from all sides, the downward trend in prices will prevail.

The second, Moore’s law notes the accelerating reduction in the cost of computing power. The computer you bought last year will have half the power of today’s computer at the same price point. More specifically, Moore’s Law states the number of transistors on a chip doubles every 18 months (Webopedia, 1998). As a result, the cost-performance rises as the square of the number of transistors. Electronic game companies are leading the way in the development of inexpensive high powered computers. Okamato, a vice president of Sony, the company that makes the Playstation and PSP, said "Moore's Law is too slow for us," noting that his company is not willing to wait 20 years to achieve a 1000-fold increase in PlayStation performance (Kosak, 2002).

At the same time that computing prices are falling, the price of paper is continuing to rise. If the cost of computing power continues to drop at the present rate as predicted, this year’s computing power, in ten years, will be available on a sheet of paper. And the main cost will be the paper.

Third, Metcalfe’s Law states that the value of a network increases as the square of the number of users. For example, one fax machine is worthless, with two it becomes useful and it becomes more useful as you add more fax machines to a network. When the majority of businesses have a fax machine, it becomes indispensable (Wikipedia, n. d.-a).
For education, face-to-face classroom-based courses have tended to be more interactive. Correspondence education required self-study skills and discipline, while the large televised courses incorporated few opportunities for interaction. Now, with the power of networks, large scale classes can incorporate real interactions, including group learning, simulating the small class experience.

A fourth “law” predicts even greater exponential power for networks: Reed’s Law of Group Forming Networks (Reed, n.d.) (or Seeley Brown’s Community Law) (Brown & Duguid, 2000). This law states that the value of a learning network also increases as 2 to the power of the number of learners connected to it. From peer to peer networking to learning communities, contrary to accepted wisdom, the learning opportunities increase with larger groups. For example Java programmers belong to Java users groups online, where they help each other learn and develop their programming skills. The larger the group, the more useful it becomes.

Fifth, Kurzweil’s Law of Accelerating Returns goes further and posits that these exponential changes are themselves changing exponentially, claiming that technology will progress by 20,000 years (at the present rate) in the 21st century. Network and computer power along with cost-effectiveness will drive this exponential growth in the rate of exponential growth (Kurzweil, 2001).

**Trends in education**

There is a growing trend to evaluate learners achievement by outcomes. Now that the students have finished this course or that programme, what can they do? This also pertains to our institutions, which are presently evaluated on their inputs such as the number of PhDs on faculty, the number of books in their library, etc. Industry is more interested in whether or not graduates can write a paragraph, or interpret a graph etc. They have less interest in how this was accomplished.

Mass customisation of courses is now possible providing individualised learning opportunities to large number of students. Training companies like SkillSoft serve large number of students around the world (Skillsoft Home Page, 2005). When asked what the student/teacher ratio was, a spokesman replied: “One-to-one.” When students need it, they get personal attention from a tutor. This is only possible with the power of networks.

Peer teaching is also a growing trend, especially as part of the growing importance of informal learning, where people with specific interests get together online and help each other learn (Goldwasser, 2001). If one were to look at a learning continuum one might determine an order where the optimum means of learning would be by “doing”, that is by actually being involved in performing the skill to be learned. One could argue that having once learned a skill, it can be reinforced and enhanced with practice, and improved even further through teaching it to others. Especially if you are performing the skill while you are teaching it. In this way you are focused on doing it right and paying attention to the manner in which the skill is performed.

The digital divide of computer haves and have nots is rapidly diminishing in the developed countries as more and more families purchase home computers and others have access through libraries, cybercafés, computer laboratories, and community access centres. In the developing world, the growth of access to wireless telephony using mobile phones is a significant development. The next generation of inexpensive Smart phones will do much to break down barriers.

Learning objects are standardised interchangeable components for learning. At present, a wide range of different institutions are creating similar content and reinventing the wheel. We no doubt, need to have a dozen or some might argue a hundred lessons teaching the same concept, for example: the application of a lever. But do we need thousands? With learning objects course developers should be able to “engineer” courses by assembling components and using their expertise, assemble them into a quality course. With the new developing international standards for the exchange of learning objects, the cost-effective assembly of quality courses will become a reality, opening the way for the free exchange of learning content (McGreal, 2004).
The growth of the Open Source/Open Archive initiatives will ensure that learners, regardless of cost will have access to a wide range of software applications and learning content. Open source learning management systems like Moodle and Sakai are reducing the costs of delivering courses online to large numbers of students (Moodle Home Page, 2005; Sakai Home Page, 2005).

Jimmy Wales, one of the founders of Wikipedia the free online encyclopedia claims “It is my intention to get a copy of Wikipedia to every single person on the planet in their own language. It is my intention that free textbooks from our wikibooks project will be used to revolutionise education in developing countries by radically cutting the cost of content” (Wikipedia, n. d.-b).

Global competition has arrived. In education, it is in its infancy. Most students who study online do so from a local institution. On the other hand, private US companies like Phoenix University or the Devries Institute educate hundreds of thousands of learners in the US and overseas.

Philanthropists, advertisers and sponsors will find it opportune to support the development and delivery of online lessons and courses. Philanthropists will find that their donations will have a lasting beneficial effect on the learners supported. Advertisers will find that associating their names with learning will pay dividends.

**Mobile devices**

Distance education is on the brink of another shift. Mlearning or education on the go – thanks to mobile phones and personal digital assistants (PDAs), expands the boundaries of anytime, anywhere learning. However, as it is an emerging field and the potential of Mlearning is still untapped and best-practice guidelines for Mlearning are still unwritten (Keegan, 2002). Mlearning can be seen as the next stage in the development of online learning. Mlearning, or learning made accessible through PDA’s, mobile phones, ultra notebooks, or other portable wireless devices, maximises the idea of anytime, anywhere learning.

To date, some research from a student’s perspective has explored which mobile technologies are the best to employ (Bull & Reid, 2003; Rieger & Gay, n.d.; White, 2004) or what applications enable an effective learning community (Fox, 2005) and what support systems need to be in place for Mlearning (Laroussi, n. d.). Further work from a teachers perspective has shown that Mteaching can also be efficiently conducted using mobile devices (British Educational Communications Technology Agency, 2004).

In the first quarter of 2005 there were already more than one billion “data-enabled” mobile devices in use worldwide and this number is growing exponentially (ABI Research, 2005). This abundance of wireless and mobile technology has the potential to increase flexibility for distance learners. For example, not only can they access electronic versions of course materials from their personal computers as they are currently able for many courses through the Athabasca University website, but they can now download selected course materials to PDA’s, mobile phones, ultra computers and other mobile devices for review. Whether learners are on a bus, at a child’s football match or on their lunch break; mobile technology increases the boundaries of anytime, anywhere learning.

It was approximately ten years ago that distance education experienced a shift in course delivery methods. Open universities and continuing education departments of dual-mode institutions both have embraced the World Wide Web. As internet access increased, they began moving from mailing course content such as books, audio or video tapes, or photocopies of journal articles, to creating or linking to digital content which could be read on line. Students could access course materials from wherever they were, 24 hours a day without the help of a librarian.

At the same time, the technological capacity of small mobile devices has increased dramatically. Screens are bigger and better; systems have more memory; they have more multimedia capabilities;
and there are more refined methods for inputting data (Wagner, 2005). There have been constant advancements in this field creating a plethora of possibilities, such as smart phones and PDA models with unique capabilities, and a wide variety of systems and applications. According to (Clyde, 2004), the challenge “is to identify the forms of education and training for which Mlearning is particularly appropriate, the potential students who most need it and the best strategies for delivering mobile education” (p. 46). However, these mobile devices have disadvantages as well: small screens, small keyboards if they have them at all, forcing students to learn new ways of note-taking, communicating, sharing, creating and producing information.

Mobile technologies illustrate the convergence of the two types of distance education technologies (Hulsmann, 2004). Type I (information media) media such as described earlier carries the distance education content, not only in text but in many multimedia formats as well (audio, video, graphic). Type C (Communication media) include multimedia interactivity options supported by mobile technologies to allow for interaction between and amongst learners, teachers and community members using a variety of modes (audio, text and video conferencing). Together and converged, these types of media allow for the emergence of type S (social) applications that allow learners to become acquainted, work collaboratively, schedule learning and in otherways enhance learning. So, in addition to increasing accessibility, mobile devices have the potential to increase connections between students, tutors, and instructors and decrease isolation.

Convergence and divergence of mobile devices are both happening simultaneously. Mobile phones are converging as smart phones with PDA features (e.g. Nokia 9290 Communicator and the Erickson 218 Palmtop), PDAs are converging with telephone capabilities (e.g. Treo and Blackberry). Others are adding features such as video, photos, audio, and gameplayers. Divergence is demonstrated with e-books (e. g. Rocketbook and Softbook) or with specialized devices (e. g. 3d glasses and smart shoes).

Electronic game audio devices such as the PSP, Gizmondo, and IPod are very powerful and relatively inexpensive computers. These can be hacked and used for educational purposes, other than educational gaming. At Athabasca University, researchers are facilitating access to library resources using gaming devices and other handholds (McGreal, 2004).

Summary

So it seems that free education is possible. The changes described in this paper point to making free education a real possibility. With the growth of the World Wide Web, open access to learning opportunities, new international standards for interoperability, open source and open archive initiatives, along with the potential effects of the five laws, learning can be made available globally to anyone who can access the Internet.

The major technological trends supporting free education are those involving the new mobile devices: digital divergence - the growth in popularity of dedicated wireless devices for transmitting information; combined with digital convergence - the growth of all purpose devices where the cell phone is no longer just for speaking, but also for text messaging, photography, radio, even digital TV, web browsing etc. using mobile phones, personal digital assistants, handheld computers, e-books and other devices. Tavenas of Laval university warns “Change is mandatory, survival is an option. Make the right choice” (Tavenas, 2003). More optimistically, Danny Hillis commented "Let's put all this hype about change and transformation in perspective. It's underhyped. . . . There's something coming after us, and I imagine it is something wonderful" (Hillis, 1998).
References


CROSS-BORDER HIGHER EDUCATION THROUGH E-LEARNING: ISSUES AND OPPORTUNITIES

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Abstract

In the last few years, internationalization and globalization of higher education has been a well-discussed issue amongst scholars and practitioners in the field of higher education. Communication and information technologies represented by the Internet made the provision of higher education services across national borders possible. In the framework of the WTO/GATS negotiations, four modes of trading services are defined: Cross-border supply, consumption abroad, commercial presence, and presence of natural persons. Applying these four modes to educational services, cross-border supply in educational services refers to international e-learning in which neither the education provider nor the student moves. The consumption abroad refers to traditional study abroad programmes in which students travel abroad. The commercial presence refers to the establishment of branch offices in another country. The presence of natural persons involves educators travelling to another country to supply educational services.

This paper will examine four existing virtual universities that are created by consortia of universities across boarders, namely, ASEAN Virtual Institute of Science and Technology (AVIST), Cardean University, Global University Alliance (GUA), and Universitas 21 Global. They are examined in terms of the sort of institutional arrangements made to offer a degree jointly by multiple institutions, how the issues of accreditation are handled and the services provided to students besides instruction.

Introduction

In the last few years, internationalization and globalization of higher education has been a well-discussed issue among scholars and practitioners in the field of higher education. Communication and information technologies represented by the Internet made the provision of higher education services across national borders possible and such political/economic pressures as the current WTO/GATS negotiations also facilitate globalization of higher education markets. According to OECD (2004), there are four approaches to internationalization and globalization of higher education are: to promote mutual understanding between different countries; to attract skilled workers in a globalised economy; to generate additional revenues by higher education institutions; or to build a more educated workforce.

In the framework of the World Trade Organization’s General Agreement on Trade in Services (WTO/GATS) negotiations, four modes of trading services are defined: Mode 1 (Cross-border supply), Mode 2 (Consumption abroad), Mode 3 (Commercial presence), and Mode 4 (Presence of natural persons). Applying these four modes to educational services, the Mode 1, cross-border supply, in educational services refers to international e-learning in which neither the education provider nor the student moves. The Mode 2, consumption abroad, refers to traditional study abroad programs in which students travel abroad. The Mode 3, commercial presence, refers to the establishment of branch offices in another country. The Mode 4, presence of natural persons, involves educators traveling to another country to supply educational services. The Mode 2 through 4 are rather traditional forms of trades in educational services, but the Mode 1 is the latest development made possible by the use of information and communication technologies (ICT) such as the Internet.

The increasing demand of higher education in developing countries and shrinking domestic markets due to the decreasing number of youths in developed countries also propel higher education
institutions in developed countries, especially English-speaking countries, to export their services to
oversea markets. In fact, more than half (54%) of all foreign students in the OECD countries are in the
four leading English-speaking countries (i.e., the United States, the United Kingdom, Australia, and
Canada) (OECD, 2004). Cross-border higher education, not only in terms of international student
mobility but also in terms of the mobility of educational programs and institutions, will also expected
to be dominated by the English-speaking countries.

As seen in Europe where a policy initiative called the Socrates-Erasmus program facilitates
international student and program mobility and academic partnerships within 31 European countries, a
number of higher education institutions in the world have started to collaborate to create programs
that are attractive to students across borders. A newer form of cross-border supply of educational
programs, namely cross-border e-learning, has been launched by many institutions, usually being
combined with traditional classroom-teaching in local partner institutions. Those relationships
between oversea institutions and local institutions take different forms and are regulated under a
variety of arrangement. Virtual universities, in which a majority of classes are offered online for
degree-granting purposes, have proliferated in the last several years, some of them were closed down
after the dot-com bust while others still survive. Many virtual universities were created by consortia
of traditional higher education institutions.

Consortia approach has many advantages as member institutions can share risks and share expertise
and knowledge without jeopardizing their respective brand images. This paper will examine four
existing virtual universities that are established by consortia of universities across boarders; namely,
U21 Global, Global University Alliance (GUA), Cardean University, and ASEAN Virtual Institute of
Science and Technology (AVIST). Those virtual universities are examined in terms of: what sorts of
institutional arrangements were made to offer a degree jointly by multiple institutions; and how they
handle the issues of accreditation.

**U21 Global**

U21 Global is the joint venture between Universitas 21 and Thomson Learning, a subsidiary of the
multinational publishing house Thomson Corporation. Universitas 21, whose name coming from the
Latin word for university and the 21 century we are now in, was established by three Australian
universities in 1997 initially to expand student and faculty exchanges. Its membership expanded to
include 18 universities in 1999 from ten countries in North America, Europe, Asia, and Australia. In
1999, Universitas 21 decided to pursue commercial interests by incorporating itself. That was the first
instance of a commercial consortium of universities across national borders.

Thomson Learning has given US$25 million to the project and has been responsible for supplying
U21 global with textbooks, library services, and technological and administrative support, as well as
recruiting faculty to create content and teach courses. The member institutions’ involvement is
limited to providing quality assurance and funding which is reported to be at least $500,000 (Young
2001) with minimal involvement of their faculty. Diplomas are issued by the consortium, not by a
member institution, bearing the names and logos of the member universities, though ironically the
member universities have not recognized the U21 global degrees. Because of this limited involvement
in the development of the courses and in the assessment of the courses by faculty from member
universities, faculty unions in five countries have protested their institutions’ participation in
U21 global. There was also an incident of students in Australia protesting the plan, charging that the
reputations of the institutions involved would be jeopardized. Two founding member institutions, the
University of Toronto and the University of Michigan withdrew from the consortium in 2001 for
concerns over the consortium’s use of their names and logos (Maslen, 2001).

U21 global began offering trial sessions of a component of its online MBA program in November
2002, and launched its first full program in May 2003, offering courses in accountancy, business, and
IT, targeting mainly at Asian and Latin American markets. Courses are offered in English as well as
in Chinese. In 2004, U21 was reported to have 400 students from 25 countries enrolled in their online
MBA programs and in October 2004, they received 1400 applications. Though it sounds promising to have such a number of applicants only a little over a year after its launch, U21 initially projected to have 5000 students in 2004 (OECD, 2005).

To deal with quality assurance issues, U21global created its own accreditation body, U21pedagogica, to accredit all U21 courses. U21pedagogica consists of academics from universities in the consortium who evaluate U21global’s online curriculum following the same procedure used to evaluate traditional curriculum in the member universities. Eventually U21pedagogica intends to evaluate other online institutions, adding quality assurance services to its business.

Besides educational delivery, U21global offers an extensive online library to students and online career counseling.

Global University Alliance (GUA)

GUA was originally started by 10 universities, including three U.S. universities: the University of Wisconsin – Milwaukee, George Washington University, and the Rochester Institute of Technology; two U.K. universities: the University of Derby and the University of Glamorgan; two Australian universities: the Royal Melbourne Institute of Technology and the University of South Australia; Athabasca University, Canada; Auckland University of Technology, New Zealand; and the International Business School (Hoge-school Brabant), the Netherlands, in partnership with an online education company, NextEd, based in Hong Kong. NextEd is an education and training infrastructure company engaged in providing technological infrastructure to post-secondary education, primarily in Asia. Besides GUA, NextEd is involved in seven Australian and New Zealand online education/training ventures such as USQonline for the University of Southern Queensland, ACUonline for Australian Catholic University, ACAPnet for Australian College of Applied Psychology, OpenMindOnline for The Open Polytechnic of New Zealand, Aimlearning for Australian Institute of Management, Atolweb for the Pan Pacific Training Company, and ACLenglish for Australian Center for Languages.

As a privately held company, GUA was launched in October 2000 in Hong Kong. It aimed to create cross-accreditation arrangements among member institutions, which allow students to enroll in a range of courses at multiple universities. It offers online graduate and professional courses in Asia, utilizing the latest interactive web-and-data-based technologies for course offerings. Its program offerings currently include health, business and management, computing and information systems, education, engineering, and the humanities. All the students have electronic access to the library at the University of Southern Australia (Johnstone & Krauth, 2002).

Like U21global, GUA’s major target is students in Asia. There are study centers in Korea and Singapore, where students in the two countries can study locally without traveling to a member university. There are student counselors at those study centers who assess students’ education needs and provide guidance in planning students’ academic pursuits. The study centers offer courses on English language and other foundation courses to prepare students to complete undergraduate degree programs online or on-campus at one of the member institutions. There are four options for a student who pursues a degree through GUA: 1) complete the GUA foundation studies at a study center and then apply for a member institution; 2) complete all the programs at a local study center; 3) complete some courses locally at a study center and then apply for a member institution to complete all the requirements for a degree; and 4) complete some courses locally and other courses at a study center in another country.

GUA acts as a portal for a wide variety of postgraduate degrees and short courses offered by its member institutions, committing itself to building a strong brand under which all its programs from the consortium can be offered. Though a student has to apply for admission to one of the member universities and earn a degree from the home university, he or she can take courses from any participating universities. When its enrolment was started in September 2000, students in Australia,
Bangladesh, China, Indonesia, Hong Kong, Malaysia, the Philippines, Singapore, Thailand, and the US signed up for GUA classes. The quality assurance is made by an independent GUA Academic Council representing all GUA member universities, which also issues a Certificate of Completion for every course a student successfully completes (GUA Prospectus, 2002).

Their top page of their website was viewable by public last year listing all the options and services GUA offers to its students. However, now its top page has become a log-in page and no information is gleaned from their website without logging in as a member.

**Cardean University**

Cardean University is an online venture created in 1999 by the U.S. firm Unext, an American Internet education company founded in 1997, in association with University of Chicago, Columbia University Business School, Carnegie Mellon University, Stanford University and the London School of Economics and Political Science. The name, Cardean, come from Cardea, the virgin goddess of doorways in Roman mythology, as it evokes the image of opportunity (Blumenstyk, 1999). Its original idea was conceived in 1997 by Andrew Rosenfield, a senior lecturer in law at the University of Chicago Law School and a trustee of the university. The idea was developed under the umbrella of Knowledge Universe, which is a holding company in California interested in education and training companies and is owned by Michael Milken and two other close relatives of Mr. Milken.

With more than 400 full-time employees at the beginning, Unext planned to develop a series of business-related courses and initially sell those courses to multinational corporations such as General Motors, who want to train their employees worldwide via the Internet, and eventually to the public. In 2001, it started selling their courses to universities in addition to corporations and individuals. However, the economic downturn of dotcoms also hit Cardean, laying off more than 50% of its workforce in 2001.

Unlike U21global in which faculty members of its member institutions have minimal involvements in developing courses, Cardean involved faculty members in producing its courses on business-related topics and paid their institutions for the services they offered. Universities, then, would decide the way to compensate the faculty members involved. Intellectual property rights of all the course contents created for Cardean go to the institutions, not to any particular faculty member who are involved in the development of the course content. Individual faculty members who helps develop the courses do not have contracts with Unext, but make arrangements with their institutions about compensation for their involvement in the course development (Carr, 2001).

Like U21global, Cardean has the right to use member institutions’ names and logos while Cardean offers degrees instead of each individual member institution. Each member institution will have limited rights to use the courses they help to produce and the technologies to deliver them, as well as royalties for the courses which would amount to a minimum of $20 million over five to eight years. Each university will receive five percent of Unext's revenues in cash or stock options (Carr, 2000). Created during the heyday of dot-com fever, member institutions hoped to capitalize on Cardean University when it goes public.

The university has been criticized for its financial ties to Michael Milken, and the ways member universities attempt to profit using their academic resources and reputations (Blumenstyk, 1999). Faculty members of the originating institution, the University of Chicago, questioned the university’s motive to join the consortium. In 2000, Cardean University gained accreditation from the Accrediting Commission of the Distance Education and Training Council which only accredits institutions that offer programs primarily through distance education, and offered its first courses taught by adjunct professors hired directly by Unext instead of faculty members at the member institutions (Carr, 2000).

The courses Cardean offers are much shorter in duration than those offered by traditional institutions. It now offers executive courses as well as an online MBA program. A master’s degree course takes
about six weeks to complete and is based on a problem-based approach utilizing real-world business
cenarios (Carr, 2000). According to BusinessWeek Online 2003 Distance Learning MBA, there were
905 students enrolled in the Carden MBA program in 2003, 85% of which were in North America.
The program is offered through Web pages, chat rooms, online forms, and e-mail, with courses in
accounting, e-commerce, finance, leadership and strategy.

Each student who has enrolled in Cardean University is assigned to an advisor who can provide
information about the program and will answer questions regarding the university, its courses,
services and the staff through telephones and emails. Cardean also provides online library services
including online journals and full-text databases (Cardean University, 2005).

**ASEAN Virtual Institute of Science and Technology (AVIST)**

The concept of ASEAN Virtual Institute of Science and Technology (AVIST) was first proposed by
the Thai Prime Minister and endorsed by the ASIAN Summit in 1999. Subsequently, funded by
UNESCO and the ASEAN Foundation, the ASEAN Committee on Science and Technology (COST)
conducted feasibility studies and developed its implementation plan. AVIST aims to “contribute to the
development of science and technology human resources in ASEAN member countries through
continuing professional education opportunities to various science and technology sectors by
leveraging on the innovative use of information and communication technologies” (ASEAN, 2004).

Due to the fact that Thailand was the one who initially proposed AVIST, Thailand was asked to take
up the leadership role in designing, developing, and implementing virtual teaching and learning
systems at its start-up phase. Then, in May, 2004, a pilot project of AVIST was launched in Bangkok,
Thailand, hosted and coordinated jointly by the Thailand Graduate Institute of Science and
Technology (TGIST) and the Asian Institute of Technology (AIT). The pilot project offered 3-month
courses covering the subjects of bioinformatics, ecotourism and technology and innovation
management. According to the AVIST website (http://www.avist.org/), AVIST is still offering those
three courses as of August 2005. At the ASEAN Ministerial Meeting on Science and Technology
held in Jakarta, Indonesia, in August 12, 2005, it was decided to provide scholarships to enroll in the
AVIST courses.

Technically, AVIST runs on specialized learning platform called VClass. Through VClass, students of
AVIST can read documents online, download educational materials, chat with other students or their
professors, and post messages to a virtual bulletin board. AVIST courses are specifically designed to
be delivered online using two methods, the “virtual classroom learning” and the “virtual class on
demand” (AVIST, 2005). The former offers synchronous mode of instruction, requiring students and
professors to be online at the same time, while the latter offers asynchronous mode of instruction,
allowing students to access their virtual class at their own convenience. Highly qualified tutors are
made available to students, who provide academic consulting, and help desks who provide technical
assistance.

Each member country has localized its interface. For example, in Philippine, the Advanced Science
and Technology (ASTI), the research arm of the Department of Science and Technology (DoST) has
customized the localized version of AVIST by adding a short message service (SMS) capability to the
system due to its popularity in the country.

AVIST has nine members in South East Asia: Brunei Darussalam, Cambodia, Indonesia, Lao PDR,
Malaysia, Myanmar, Philippines, Singapore and Vietnam. Institutional arrangement among
institutions among those member countries was made through partnerships. For example, AVIST is
in partnership with the Philippine Research, Education, and Government Information Network
(PREGINET) initiative, and it is being targeted to deploy the AVIST platform to about 20 state
colleges and universities in the region. AVIST itself does not have a campus, but students can utilize
physical resources in participating universities.
Discussion

The above four international consortia of universities for e-learning demonstrates four different models of institutional arrangements: the first three, U21global, Global University Alliance and Cardean University, were all created in partnership with a private company: Thomson Learning, NextEd and Unext respectively, while AVIST is totally a non-profit project organized by a subcommittee of an international development organization, ASEAN. As Thomson Learning is a subsidiary of a multinational publishing house, Thomson Corporation, it is involved in every aspect of U21global’s e-learning operation including contents creation, library services, and administrative supports. In other words, Thomson Learning hired its own professional staff to develop and teach the online courses, with a limited involvement from the faculty members of U21global’s member institutions. NextEd is mainly an educational infrastructure provider; hence, their involvement in the content matters of GUA is minimal and GUA is acting more like a portal instead of an actual educational content provider, allowing more autonomy to member institutions. Unext, now Cardean Learning Group, is also an integrated solution provider for e-learning, which, besides Cardean University, has also created an online MBA program for Ellis College of the New York Institute of Technology. Cardean University pays member institutions to have their faculty members develop course contents.

In terms of membership arrangements, members of U21global have to give permission to use their names and logos in addition to paying a substantial membership fee. The member institutions are not involved in instructional aspects of U21global in terms of content creation, subject teaching and degree granting though they serve as the members of U21pedagogica which is an accreditation body to assure the quality of U21global’s courses. Information was not available as for what member institutions gain in return of their membership to U21global. GUA is rather a portal, and its relationship with associated higher education institutions are partnership rather than membership. Partner institutions provide online courses through GUA and GUA provides a portal as well as study centers to provide students at a distance with resources and counseling services. GUA itself doesn’t grant any degrees; a student has to apply for a partner institution and obtain a degree from the partner institution though he or she can take courses of any GUA partner institutions online to complete his or her degree program. As for Cardean University, each member institution is a stakeholder of the company (i.e., Cardean Learning Group) and receives five percent of its revenues in cash or stock options as well as royalties or the courses they help to produce. Cardean University offers its own degrees to its students. Lastly, AVIST consists of voluntary partnerships in which member institution will gain an opportunity to expand its student base. AVIST itself does not offer any degrees, but a 3-month training courses and issues certificates for those students who complete those courses.

In terms of quality assurance and accreditation, as mentioned above, U21global has its own independent accreditation body, U21pedagogica, all faculty appointments, subjects, and degree programs offered by U21global are subject to the prior review and approval of U21pedagogica, to ensure that these offerings reflect the same academic standard of Universitas 21 member universities. GUA also has a similar accreditation body consisting of all GUA member universities, called GUA Academic Council, which mostly assures the quality of courses offered at the GUA study centers. Unlike U21global and GUA, Cardean University has sought accreditation from a U.S. accreditation body, the Accrediting Commission of the Distance Education and Training Council, which gives a slightly more legitimacy to the degrees it offers. AVIST, being the newest creation, still seeks for accreditation arrangement.
To sum up the above, institutional arrangements of each consortium are shown in the following diagrams:

Figure 1 U21global

Figure 2 Global University Alliance
It is still too early to predict which model works best. However, it is expected to see more of these kind of international consortia in the next several years as the demand for higher education increases globally and global higher educational markets are liberalized. Issues of intellectual property rights of course materials, proper accreditation and recognition of degrees offered by those consortia, quality assurance of courses being offered online, financial sustainability, and localization issues will become complex especially if the educational services are provided across borders. Those issues need be discussed in an international context as they are no longer the issues within a country.
References


International partnerships in the higher education sector need to be viewed against a contemporary backdrop of rapid technological advance, knowledge-based global economic developments and the opening up of the education market to international competition – notably through implementation of the WTO’s General Agreement on Trade in Services (GATS), which includes education.

In order to explore the underlying issues involved in international collaborations, the quality of their procedures and end-products, this paper concentrates on a single aspect: Collaborative arrangements between universities. In particular, it focuses on cross-cultural partnerships among universities in Europe, drawing on projects sponsored by the European Union since the early 1990s. It discusses both the advantages and the challenges and pitfalls involved in academics from different European countries collaboratively constructing and presenting courses in Humanities, Cultural Sciences and Business Studies for the benefit of their students. Latterly, such joint courses have relied mainly on electronic forms of teaching and study, which raises further questions about the utilisation of the Web as an educational resource and uses of computer conferencing as a communication tool within such networking arrangements.

**Introduction**

**Globalisation and GATS**

In the contemporary context, international collaboration to produce higher education courses must take account of the trend towards a globalisation of higher education as represented by the GATS agreement (the 1995 General Agreement on Trade in Services). The Agreement is operated by the World Trade Organisation (under the auspices of the UN), the 145 member countries of which account for 97 per cent of world trade:

> GATS is the first multi-national agreement [between member countries] to provide legally enforceable rights to trade in all services. It has a built-in commitment to continuous liberalization through periodic negotiations. And it is the world’s first multinational agreement on investment, since it covers not just cross-border trade but every possible means of supplying a service, including the right to set up a commercial presence in the export market. (World Trade Organisation Secretariat, 2002)

While we may all be familiar with the notion of liberalisation and globalisation in trade, these ideas are fairly new as applied to services. Education is among the services concerned. And, according to Hawkridge (2005, p.7), “In the medium- to long-term, GATS has serious organisational, cultural, legal, political and economic implications for…education”.

Under the Agreement, countries are expected to file requests for liberalisation of services in other countries and also to offer to liberalise their own services. So far, the USA has requested access to higher education, adult education, training and educational testing services in all countries, and, along with Australia and New Zealand, is pressing for full liberalisation of the education market. Canada and the UK, however, have declared that they are not offering access to their publicly-funded education services. As yet many countries have not made their position on GATS known, though they...
will have to before long. And the stakes are extremely high for countries that export education (that is, the richer western countries): in 2000, for example, exports of educational services were worth over $10 billion to the USA, $3.7 billion to the UK, $2.1 billion to Australia and $0.8 billion to Canada (Larsen et al., 2002). These countries are no doubt planning to reap far greater rewards once the Agreement is fully underway.

An internationalisation of higher education, then, seems inevitable and is indeed already underway. We may assume that this is likely to be most pronounced in distance education, in which collaboration with other providers can be expected to yield greater economies of scale – and it is, of course, predicated on extensive use of Information and Communications Technologies (ICTs). When an institution has these technologies at its disposal and can apply them effectively it is possible to attract and educate students from locations anywhere in the world, provided the necessary technology is available or can be made available there, without the trouble and expense of setting up satellite campuses in those locations. As Hawkridge (2005, p.2) remarks:

Proponents [of globalisation] see knowledge as a commodity and education as a service, to be traded globally, and students everywhere as customers whose needs can and must be met through globalisation, which is a creative gale.

They would claim some positive advantages for it: enrichment of the curriculum, wide provision of high-quality courses, and scarce staff expertise made available to students in many countries. Perhaps some of these considerations underlie MIT’s decision to make its ‘courseware’ freely available (OpenCourseWare at MIT (US): http://ocw.mit.edu/index.html). But globalisation of higher education has many detractors too, who see it as more of a destructive than a creative force.

Some regard cognition in e-learning as different from that in embodied forms of education, and inferior to it (see Dreyfus, 2001, and also critique of his argument in Blake, 2002). Others fear that global education will tend to impose common curricula, teaching-learning methods and indeed the English language, so ultimately reducing cultural diversity (see Ess, 2001; Chambers, 2002; Mayor and Swann, 2002). Furthermore, global education is seen as incompatible with social objectives in many countries (Stromquist and Monkmann, 2000): “nowhere are the poor able to benefit from services they cannot pay for” (Hawkridge, 2005, p.2). Finally, the ‘nightmare scenario’ of a takeover of higher education by private companies is said to threaten us all: corporations such as Microsoft, publishers like McGraw-Hill and Pearson, and private for-profit universities.

Underlying Principles of Collaboration

Certainly, it may be prudent for distance educators to explore the possibilities for wide collaboration. Meantime, it will be to their advantage to consider some of the issues surrounding international collaboration within the university sector, to which the GATS agreement lends considerable urgency. This paper focuses on co-operation between universities in Europe and draws on some of the collaborative projects undertaken by member countries of the European Union (EU) from the mid 1990s, necessarily selectively.

The paper draws on three projects funded in EU (Socrates and Minerva) programmes. Although, as we shall see, these projects differ in important respects, they share a basic philosophical underpinning. Put simply, the belief is that genuine collaboration depends upon the development of projects from the ‘bottom up’. For successful joint enterprises, professional educators in different universities and countries must want to collaborate together; they cannot be yoked together by policy or by fiat imposed from on high. They must see certain advantages in co-operation, for themselves and their institutions, and they must feel that they ‘own’ both the process and its outcomes. In short, the collaboration must work for all of them. Otherwise their contributions to a project will be half-hearted at best, and there will be little possibility of changing practice or sustaining innovation in their institutions. But of course a statement of such underlying principle is just a start; the hard thing is to
translate it into practice. How can ‘bottom up’ collaborations be formed and maintained, how can ownership of a project be shared and how can it be made to work to the benefit of all concerned?

Some European Collaborative Projects

In 1994 a course in European Studies, entitled ‘What is Europe?’ (WiE?), had been prepared jointly by colleagues in several institutions and countries under the auspices of the European Association for Distance Teaching Universities, and was first presented in the partner institutions. It was a text-based course, which had taken over four years and expensive resources to prepare, but some of its features were nevertheless to become the model for a number of more modest, web-based teaching experiments in the following decade. These initiatives were prompted by the EU Socrates programme, launched in 1995 to contribute to “the understanding of the cultural, artistic, political, economic and social characteristics of the other Member States” (Official Journal of the European Communities, 1994). In 1996 some of the collaborators who had combined forces to produce WiE? entered into partnership in the project ‘Creating a European Forum for European Studies’ (CEFES, 1997-2000), along with new partners. In this project, students in Europe would exchange views in virtual seminars (computer conferences) which were to be additional, enriching elements in their undergraduate education; that is, additional to their home-based courses, and unassessed. CEFES took as its theme ‘European Identity’ and, over two years, enabled some 200 students from different European institutions and countries to engage in discussion of the issues in virtual seminars, guided by tutors, on a voluntary basis. Some of these universities were dedicated to distance education (single mode, such as the Universidade Aberta, Portugal, the Universidad Nacional de Educación a Distancia, Spain, and the UK Open University), two others were dual-mode (campus-based and distance education, the University of Aarhus, Denmark, and Universität Lüneberg, Germany) and one was a fully campus-based institution (University of Surry, UK); the project was co-ordinated by the Deutsches Institut für Fernstudienforschung, a German research institute. Each institution of course had its own, existing methods of developing courses and supporting its students.

Already we see here some answers to our questions. It helps greatly if at least some of the participants in a collaborative project are already known to one other; they have worked together in some capacity before, and have established good working relationships and feelings of friendship and trust. It should also be clear that in order for these different types of university to own and derive benefit from the project – for the partnership to be maintained successfully - project arrangements have to be flexible. And as far as possible they should be grounded in institutional realities, reflecting the experiences of real students following particular courses, rather than ‘experiments’; academic seminars are traditionally vehicles for knowledge exchange in European universities, so virtual seminars work with the grain of established practice. Finally, the exchange of views among students in the seminars needs to be meaningful. Raybourn et al. (2003, p.98) sum up:

> Lessons learned from face-to-face communication tell us that the quality of successful collaborations depends largely on sharing cultural and contextual information [Rogers, 1995]. Cultural information shared by collaborative organisations or communities of practice [Wenger, 1998] includes the assumptions, values, goals, meanings, and histories shared, negotiated and co-created by its members. Intercultural communication is the exchange of this information and the co-creation of meaning between individuals or among groups (teams, organisations, etc.) that perceive themselves to be different. As our organisations become more diverse, the challenge of intercultural communication is heightened.

CEFES

Drawing on the experience of WiE?, the CEFES team set out to do three things: together to develop a curriculum for a ‘course’ in European Studies that could be integrated into the regular programmes of all the participating universities; to run virtual seminars on the topics of the course, with occasional invited guest ‘speakers’; and to train lecturer-tutors to improve their technical skills and their ability to teach cross-culturally (which is not discussed in this paper, but on this and other CEFES-related
matters see Baumeister et al., 2001). There were three modules, or ‘sequences’, in the course: The Identity of Europe: A historical phenomenon; The Europe of Identities: A political phenomenon; Globalisation: Implications for European identity. Each was of eight weeks’ duration, involving a three-week preparatory period, a four week International Forum (a computer conference, or virtual seminar), and an evaluation period. Each had a co-constructed syllabus, consisting of themes, key questions, tasks, and readings, to be studied during the preparatory period and subsequently discussed in the International forum, in English. The sequences could be studied independently (one or more), as in the first year of the project, or all three sequences could be studied one after the other to form a coherent course, as in the project’s second year. First-year practice turned out to be the more successful. European countries have different start dates for academic terms/semesters, different holidays, festivals, etc., and trying to find three blocks of eight weeks during which all the students could participate was extremely difficult. In the second year of the project student participation tended to fall away as the course progressed, mainly owing to practical difficulties of this kind. Clearly, offering ‘bite-sized’ elements, and choice, are important aspects of structural flexibility.

Crucially, however, the collaboration was maintained successfully and integration of CEFES in the universities’ regular programmes was achieved by adoption of a decentralised teaching model. The partners constructed the syllabus for each sequence collaboratively – two institutions, in different countries, took the lead each time, and the outcome was discussed and agreed by all the partners before being implemented. But when it came to the relationship between the CEFES sequence and the institution’s regular courses, each university made its own adaptation. Thus Surrey, as a campus-based university, held related face-to-face seminars during the preparatory period and thereafter; just a few of the Surrey students would actually participate in the International forum discussions at any one time, representing the views of their peers. Meanwhile, the Universidade Aberta established a ‘national conference’ (later taken up by other universities) in which the distance students first discussed the readings set in the syllabus in their own language, thus establishing a surer understanding of the issues before beginning to contribute to the International forum. In fact, as an aid to inclusiveness, what became known as a ‘representative speaker’ convention became established in the project as a whole. This allowed any student group to nominate a few of its number to contribute to the International forum on its behalf, thus sheltering those who felt unsure about their ability to write in English, or just very unconfident to ‘speak’, while enabling them to follow the discussions. The fact that the distance students were usually obliged to operate as individuals made no difference – decentralisation meant that each university was free to make whatever teaching arrangements suited it and its students’ best. Thus, everyone could choose to study the CEFES sequence(s) that were of most relevance to their programme of European Studies, and do so in ways that best chimed with their circumstances and met their needs.

Inclusiveness and equal ownership of the project were also enhanced by the way in which the International Forum was designed to operate. Each virtual seminar was moderated by (at least) two tutors from different institutions and countries, so that by the end of the series each national partner-institution had taken its turn to lead a conference in co-operation with at least one other. This ensured negotiation and some accommodation between different academic traditions of teaching European Studies within Europe, and allowed a range of debating styles to be represented in the discussions (for the different orientations to study across Europe, see Teichler and Maiworm, 1997). Consequently, no single conception of ‘European Studies’ would predominate in the discussions and no one culture’s perceptions of, for instance, aspects of the past or the implications of globalisation would prevail. But, primarily, the moderators’ job was to help students learn through and from the process of cross-cultural exchange; the aim of the virtual seminars was a genuine exchange of views across borders - a co-creation of knowledge and understanding, such that a ‘third culture’ might emerge online. Raybourn et al. (2003, p.106) describe this process:

A ‘third culture’ is what is created from an intercultural interaction when persons from different cultures communicate equitably and with respect for the other such that the emergent culture reflects appropriate input from each interlocutor. A third culture is the co-creation of meaning in which all interlocutors are participants as well as co-owners. In effect, together
users co-create a ‘third culture’ that is neither one nor the other, but a combination of the two, or three, and so on.

In this connection, teachers whose first language is not English are especially sympathetic to students’ attempts to express themselves in a second (or third) language – better able to read between the lines, looking beyond non-standard locutions, grammatical errors and the like, to the core of their meaning – and also sensitive to the students’ needs for further explanation and guidance from time to time. This strategy ensured that one such teacher was involved in every conference.

Dec. Knowl

Many of the ‘bottom up’ characteristics of the CEFES project were reproduced in the project ‘Decentralised Knowledge – Networked Resource-based Learning’ (Dec.Knowl, 2002-04), notably the decentralised teaching model, the operations of the virtual seminar and the tutor training programme. However, there were major differences too. In the first place, this project involved collaboration among colleagues in Business Studies, all of whom had been known to each other for some time through membership of an international consortium of Business Schools (the Universities of Reutlingen, Reims, Madrid, Lancaster and Dublin City), including a university in the USA. Second, in addition to constructing a syllabus for the virtual seminar, on aspects of Globalisation, the participating institutions were to construct a Knowledge Base in International Business Studies. This was to be a wide-ranging resource, including lecture notes, web links to resources and readings, etc., which it was hoped would make the process of curriculum development more collaborative and exploratory. Third, the students in Dec.Knowl were offered accreditation for their involvement in the virtual seminar preparatory work and/or the seminar itself.

As regards personnel, we again see at work the principle of building on previous partnerships, of constructing the collaboration on the basis of knowledge and trust. Even so, this partnership was strained by the aim to construct the shared disciplinary Knowledge Base (KB) since, among other matters, it raised the question of property rights. The partners were reluctant simply to ‘donate’ their curriculum designs and lecture notes, or the fruits of their own research in the form of bibliographies and web links, which in higher education are traditionally regarded as institutionally owned or as their personal property (see Johnes, 2004, for the background to these issues). There was also the difficulty of deciding on the right kind of technical platform for the KB, and appropriate metadata for the Knowledge Objects it contained such that it could be searched (Rae, 2004). The upshot was that the conception of the nature and purposes of the KB changed over the course of the project, from a knowledge repository – a content-oriented academic resource - largely for use by course designers in International Studies, to a constantly evolving resource on Globalisation for use by students during the virtual seminar, to which they too could contribute. That is, the conception changed from a relatively static structure to a dynamic student-centred process.

In short, the project made the important discovery that there are limits to collaboration, even among colleagues/institutions known to each other. There was little support for the idea of sharing management structures, such as curriculum designs, and resources, and much more enthusiasm for sharing pedagogical ideas and strategies. For a number of reasons, the notion of a ‘community of experts’ freely sharing their expert knowledge did not take root.

As regards accreditation, widely known to be important for students’ motivation to participate in online discussions (McConnell, 1999; Salmon, 2000), the Dec.Knowl team made it work for all the partners by adopting a decentralised approach - just as they had for teaching in this and the earlier project. Rather than trying to reach agreement about accreditation across the partnership – a particularly sensitive matter for the different institutions – the project left the various partners free to make their own arrangements: “This way each of the partners could harmonise the online seminars within their own standard teaching provision and offer credit according to their own internal procedures” (Wetzel, 2004, p.59). For example, at Lancaster students were asked to submit an essay based on the discussions experienced in the virtual seminar, which was worth one-third of the marks...
in a UK 15-credit course (or, around 30 ECTS points). At Reutlingen, as well as writing an essay the
students’ written contributions to the seminar itself were assessed, together worth up to 50% of the
end-of-course grade. At Reims, students joining the seminar from one programme were assessed –
worth one credit towards the final degree – while those from another programme were not.

The project also aimed to be sustainable, able to integrate e-learning into the participating
universities’ regular programmes of study. In this respect the outcome was mixed. Those elements
closest to the working lives of the academics concerned were the most successful: the study
programme (preparatory work package), the virtual seminars, and tutor training. Although the partners
have run further seminars beyond the life of the project, and new members have joined the
partnership, we have seen that the most ambitious element of the programme - constructing the shared
Knowledge Base - was problematic. Making the original KB conception successful would require the
input of considerable resource along with changes in institutional culture. In particular, the evaluators
concluded, it would require informed leadership – support for collaborative e-learning from influential
people at a high level in the universities.

RESULTS

The RESULTS project (The Role of Universities in Regional Economic Development), which is
ongoing, in particular aims to tackle this issue of ‘buy in’ to e-learning by senior staff of the
participating universities, as leaders of their research communities. Instead of recruiting
undergraduate student participation it aims to enrol Masters and research students, and their
supervisors, in order for innovation to become embedded at higher levels in the institutions. Another
major difference between this project and the earlier ones is that the focus of RESULTS is
collaborative work among the students, linked to an assessed piece of work. The work package sets up
a number of topics, which the students may choose to tackle in international sub-groups of four or
five. Each sub-group researches the chosen topic, in ways agreed among them, for a period of four
weeks. Subsequently, the students individually prepare an assignment in draft form, which is posted in
a whole-group Open Forum. Following discussions in the Forum, each assignment is re-drafted and
submitted for marking to the students’ own (home) supervisor – who grades the work in accordance
with the rules that normally apply within that institution. In due course, the assignments (plus
references and supporting materials) are to be lodged in a Knowledge Base which will serve as an
ongoing teaching and research resource for the partner institutions.

The project has not reported yet, but its aims are clear. We can expect some illuminating findings
regarding the workings of literature-led trans-national study groups, as well as the extent to which the
strategy to involve more influential partners helps to ‘mainstream’ and sustain e-learning programmes
in the universities.

**Conclusion: Characteristics of Sustainable Collaboration**

As we have seen from the chosen examples, during approximately a decade of European
experimentation the emphasis has shifted from how to forge partnerships between universities that
promote meaningful learning opportunities for all their students (how to mount and run successful
virtual seminars, how to integrate assessment of the outcomes in ways that accommodate the different
European assessment regimes, how to train teachers effectively) to consideration of the ways in which
international e-learning programmes may become embedded in the partner institutions – no longer
experiments, but established aspects of university education in Europe for undergraduate and graduate
students alike. Such sustainability is among the most pressing and intractable challenges still facing
us. And it is clear that it will be achieved only by involving senior staff of the universities in e-
learning projects, and convincing them of their value.

But this is still not enough. Drawing on evaluation of the Dec.Knowl project, Baumeister and Wilson
(2004, pp.74-5) list all the factors that must be present for successful mainstreaming of e-learning in
the university, as follows:
- support for e-learning by influential people at a high level in the university
- commitment to e-learning by key staff at departmental/faculty level
- reasonable content area, where e-learning makes sense
- some resident experts in e-learning (both technical and pedagogic aspects), to advise and provide staff training
- planned, specific e-learning projects, along with adequate funding to support them and enthusiastic staff members to execute them
- evaluation of the projects, with the processes and outcomes disseminated widely in the university (and beyond) and fed into e-learning policy development.

Arguably, universities need to experiment among themselves, and to understand e-learning processes at every level and in all respects before they consider entering into the wider forms of collaboration referred to at the start of this paper – with global corporations, publishers, etc. For only then will the universities be in a good position to know what they want from such collaborations, and to ensure that they work well from their own, and their students’, points of view.

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GLOBAL TRADE IN EDUCATIONAL SERVICES: IMPLICATIONS FOR OPEN AND DISTANCE LEARNING (ODL)

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Abstract

It was incongruous, until recently, to refer to international student mobility as international trade in educational services. Indeed, considered crucial and innocuous for socio-cultural development, such traditional forms of trade in educational services as international student/teacher mobility across borders may remain benign. Similarly, signing of memoranda of understanding or letters of agreement with overseas institutions for research and for purposes of resource sharing – expertise and hardware – is not uncommon. Trade in educational services assumes a new dimension with the inclusion in GATS of foreign investments in the educational sector and borderless education through e-learning provisions. As much as there are commercial motives, there are the ubiquitous cultural and political rationales behind policies to globalise education.

Against this backdrop, the paper analyses the implications of GATS for ODL by examining various aspects such as the relative value of removing knowledge from the realm of public domain and considering it as a commodity, the impending Intellectual Property Rights (IPR) regime that is potential to make information dearer to the already disadvantaged societies, the fostering of collaboration or competition among institutions, however skewed it may be, the reframing of existing national quality control/assurance mechanisms and the evolving of international quality audit systems as they pertain to higher education in general and ODL (including e-learning) in particular.

Context

Skewed growth seems to remain the world order and continues to be more a rule than an exception, no matter what the sphere of concern is. While, on the one hand, for example, there is astounding growth in technologies, which include information and communications technologies (ICT), biotechnology, space technology, etc., contributing to improving the quality of life, on the other, countries are getting devastated for reasons ranging from HIV/AIDS, food insecurity, malnutrition, environmental degradation to engineered political instability cankering human value systems. This, despite the fact that these very impoverished countries are among those in the world endowed with natural resources that many of the developed economies cannot boast of.

Technologies to harness these resources and synergize them into capital – hard or/and human – are available, but unfortunately not at the countries that need them. Countries possessing the technologies, however, are so much obsessed with power that a sense of neo-colonization of the resources and people who own them willy-nilly prevails. And, the stories of poverty, malnutritioned children who wear holes for eyes, forlorn women trafficked to feed the flesh-starved, etc., make media/business sense to some, while people across the continents devour them day in and day out with an insatiable hunger for melodramatics. The power of story-telling is such, thanks to the advancements in ICT available to the rich countries, that the attention of people gets limited to the stories per se and not the roots and the routes to reverse the scenes of inhumanity to those of prosperity. This may be but quite logical because the stories are told sensationaly by someone about someone else both of whom are unconnected whatsoever with our lives. The impact the stories makes, if ever, is short-lived when the world all around is witnessing disaster, natural or human-made, one after the other.

International agencies created with a view to establishing an atmosphere of level playing among countries of the world, big or small, land-locked or water-locked, developed or developing, seem to
have lost their focus in the course of time and now function more as a minion to the developed countries than as a savior for the countries that need them. Outliving the purposes for which they have been created, these agencies are slow to accommodate such of the changes as are of benefit to the developing world, following the dictates of the global politics. Nonetheless, the silver lining, however delicate, the non-governmental interest groups that are active in various fields bring, in the otherwise myopic situation, cannot be ignored. The slow but perceptible public and private alliance that is emerging – be it in the developing or developed economies – towards the formidable task of improving the quality of life can also make a huge difference in the way resources are mobilized distributed and used. There is, however, no room for complacency. The alliance has to be strengthened and accelerated if the 6.5 billion-strong world in which we live is to be made a better place.

What this means is that, at one level, there seems to be increasing despondency owing to lopsided growth perpetrated by global politicking and, at another, there is hope born out of growing realization for private and public partnerships for improvement of livelihood and quality of life. Put differently, to mitigate the power of adverse policies that wish to perpetrate the system of dependent countries, the tool that can be meaningfully used and with tangible result is education.

**Millennium Development Goals (MDG)**

That education can make a difference is not something novel, and this precisely is the problem. In other words, we are aware that education holds the key for development, and countries that are now affixed with the qualifier ‘developed’ bear testimony to the phenomenon that education has been and is contributing to national development. That is to say, if education can improve the quality of life, work towards wealth creation and make the world a better place to live, what prevents us from implementing policies that guarantee education to all and corresponding plan of action for implementation? What prevents us from creating the required human and material resources to address the issue of education for all? What prevents us from redistributing the resources to take education to all? What prevents us from reforming our educational systems in order that equity and quality are assured in education, little matter who and where the learners are? If investments in education do assure rich dividends in terms of national development and social transformation, what may be the stumbling blocks? Whose responsibility is it any way to make education available to all who aspire for it? These are not merely rhetoric questions but questions that beg convincing answers.

That said, there is also no dearth of international and national commissions and committees to voice the need for education. What is, nonetheless, lacking is the collective efforts to put the resolutions of these bodies into actions, and therefore many such pointers for growth remain dormant, while the world continues to be lopsided.

One of the Millennium Development Goals (MDG) orchestrated by the United Nations (UN) and committed by world leaders speaks of universal basic education to all at the turn of the 21st century, but the recent report of the progress made on the commitment diplomatically speaks volumes about the long distance one has yet to travel before the commitment is fulfilled. It is of interest to note that this goal is addressed at the developing world such as Nigeria, Brazil, India, etc., where the millions are still deprived of education. It may be noted that it is the advanced countries that seem to show interest in achieving basic education to all in the developing countries.

On the face of it, this gesture is commendable because they, flaunting their growth as a result of making available education to all, try to impress on the developing economies to put systems in place to ensure education to all their citizenry and thereby ensure growth. These very countries perhaps know for certain that implementing the policy is a Herculean task in most of these so-called developing countries, given the existing pathetic state of affairs in these countries owing to centuries of deceit they have been subjected to. Instead of making toasts for world progress through education, what should have happened is the minimum commitment from the relatively richer countries to create sustainable support mechanisms, which did not happen. But then, why should they?
Of the many ways of looking at this question, two may be of paramount importance in the emerging context. One way of addressing this question is that the developed economies do have a stake, given the market economy. In other words, insofar as their products and services are concerned they have to reach a wider market, lest they will have a dwindled economy. Markets get widened, when the buying power of the population increases, and this increase is dependent on the national socio-economic development which in turn is generally the result of quality education. It is for this reason, untold, that developed economies are interested in upgrading the educational status of the developing ones. Making a parody of the intentions of world organizations and rich countries and attributing self-serving ulterior motives to their intentions may sound irresponsible and quite mean. One cannot, of course, paint their intentions with a broad brush and trivialize them. However, in the same vein, one cannot also ignore the point that is being driven home. In short, the developed countries do benefit from the growth of developing countries as long as the growth is monitored in a way that the exclusive clubs, representing the developed world, do not get additional memberships.

There is also a completely different way of looking at the question. Why should others be interested in capacity building exercises, if the countries which must show interest themselves ignore the issue? When the countries that should have seized the opportunity to redraw their priorities and strive to put a smile on the face of its citizenry themselves are indifferent to the cause, owing to vested political interests, expecting others to support them to upgrade their human resources and therefore all other resources is far-fetched, to say the least. In other words, if the interim report of the progress made on MDGs points to the less-than-satisfactory state of affairs, evidently, a whole host of factors are at play. Of the many, one is the weak political will. This combined with the huge amounts required to right the wrong that has been in practice for over decades and even centuries proves to be a powerful cocktail that dulls the spirit, even assuming there is one, of providing education to all.

What this means is that while the underdeveloped and developing world must put their acts together by, among others, refocusing their priorities, the developed nations must extend possible support to facilitate the required changes to take place. This should be taken up as a matter of urgency because even where there is political will, however cash-strapped the will may be, the task of educating the mass is becoming the prerogative of private enterprises, run on corporate model. There is no harm in this model as long as the purpose remains education-specific. However, not many private operators nurture the goal of social transformation. At the same time, we cannot also throw the baby with the bathtub! Careful handling of the situation is very important because in some instances the academic/training offerings the private operators make are more socially-relevant than that by government agencies as the former does contribute towards livelihood improvement and wealth creation. This indeed is a tight-rope walk for elected governments to manage the growth of private interests in educational matters without losing their social mandates to them.

Already, indicators are such that the responsibility of the government are being arrogated by private players who provide education on their terms, some of which prove to be, as mentioned, more discerning than offerings made through government sectors. However, leaving such a State subject to the realm of private concerns potentially divides the already imbalanced societies. The purpose for which the arrogation took place thus remains unfulfilled, while the very act of arrogation further deepens the divide. It therefore does more harm than good. The potential of digital and social divide is more now than ever before in the context of General Agreement on Trade in Services (GATS) of the World Trade Organization (WTO).

**WTO/GATS**

The current debate on the implications of GATS on higher education is divided. On the one hand, there is a view that highlights the benefits that educational trade can bring in terms of increased access to international new knowledge and economic gain, while on the other, the focus is on the threat GATS poses to the role of government, the state of education as public good and the nature of quality of education.
The inclusion of education as one of the trades in services has a direct link to the current trends in higher education, which include the emergence of corporate-model for-profit educational outfits, the growth of seamless online educational provisions, emerging knowledge-driven markets, the upsurge in transnational mobility of experts and professionals and the dwindling government budget for higher education. In other words, the inclusion of education in GATS seems to be a response to as well as a contributing factor for the current trends in learning provisions, demography, market, etc.

An Organization for Economic Cooperation and Development (OECD) study in 2002 estimated that the value of trade in education services was about US$ 30 billion in 1999. This is a conservative estimate in that it was based on students studying abroad and did not include other types of cross border education. Today, the market may be worth more than US$ 3 trillion. WTO aims to capitalize on the market potential and promote international trade in education services within the stipulated rules and procedures to assumedly eliminate trade barricades.

The GATS defines the following four modes or ways of supply in which a service, and in the present context education service organized into five categories of primary, secondary, higher, adult and other (e.g., language testing, student recruitment, etc.), can be traded:

1. **Cross border supply**: This means a service crosses the border and does not require the physical movement of the consumer. This includes distance learning, e-learning, virtual campus, etc.
2. **Consumption abroad**: This means the movement of consumers to the country of the supplier. This is a popular mode of supply since time immemorial in that students move to other countries for studies.
3. **Commercial presence**: This means the presence of a service provider in another country in order to render service. This includes setting up local branches or satellite campuses, franchises in another country.
4. **Presence of natural persons**: This means persons travelling to another country on a temporary basis to provide service. This is a common phenomenon in that professionals work abroad.

On the face of it, GATS is benign and innocuous as it promises to provide international education at local contexts. But, does it have another face? And, that is the trillion dollar question. It is this question that compels us to examine the obligations that govern GATS.

When a country under GATS allows foreign competition in a sector, equal opportunities in that sector should be given to service providers from all WTO members. This applies to the mutual exclusion treatment as well. For instance, when Country A allows a foreign education provider to establish a branch campus, it cannot deny the same opportunity/treatment to other WTO members. Or, if Country A chooses to exclude Country B from providing a specific service, then all WTO members are excluded from providing such a specific service. This puts the countries in Catch 22 position: if a country allows foreign access to its educational services, it cannot be a chooser as to who will be allowed, and the scenario is no different when the country does not allow foreign access. In addition, once a foreign supplier has been allowed to supply a service in one’s country there should be no discrimination in treatment between the foreign and domestic providers. While putting the ‘public good’ concept of education at risk, this questions the sovereignty of a country.

Supporters of the GATS emphasize that education is, to a large extent, a government function and that the agreement does not seek to displace the public education system and the right of government to regulate and meet domestic policy objectives. Nonetheless, critics express concern that the whole question of the protection of public services is very uncertain and potentially at risk because the phrase ‘governmental authority’ could not be conclusively defined. Clearly, which higher education and higher education providers or services are exempt from GATS is ambiguous.
As a result, different rationales and approaches do exist as regards the GATS is concerned. A consumer-oriented rationale can be the need to provide a wider range of opportunities to consumers or the need to protect consumers by assuring appropriate levels of access to and quality of education services. An economic rationale can be a way to increase trade revenues for exporting countries or a means to attract additional investment for education for importing countries. A socio-cultural rationale may be the threat of foreign dominance or exploitation of a national system and culture.

Among the number of unanswered questions that still remain, the social development goal of education and the governmental role of education assume significance. Relevance, quality and accreditation are at the heart of this debate. For example, the importance of frameworks for licensing, accreditation, qualification recognition and quality assurance are important for all countries whether they are importing and exporting education services. Developing countries have expressed concern about their capacity to have such frameworks in place in light of the push towards trade liberalization and increased cross border delivery of education. Although the agreement focuses on temporary movement of the labour force, it may lead to and facilitate permanent migration as well. The implications from increased mobility of teachers and researchers are particularly relevant to developing countries. It will be a major challenge to improve education systems if well-qualified professionals and graduates are being attracted to positions in other countries.

The GATS induced-trends could be the following:

- The use of information and communications technologies (ICT) for domestic and cross-border delivery of programs.
- The growing number of private for-profit entities providing higher education opportunities domestically and internationally.
- The increasing costs and tuition fees faced by students of public (and private) institutions.
- The need for public institution to seek alternate sources of funding which sometimes means engaging in for-profit activities or seeking private sector sources of financial support.
- The ability (or inability) of government to fund the increasing demand for higher and adult education.

Ensuring access to education is going to be a formidable responsibility for public (government) education institutions in a scenario where the demand for higher education is steadily growing, often well beyond the capacity of the country to provide it. GATS enthusiasts maintain that consumers/students can have greater access, as providers are ready, under the trade, to offer higher education services across borders. Non-supporters, however, believe that access may remain as it is, and if anything, may still be limited because trade will commercialize education and consequently escalate the cost of education and perhaps lead to a multi-tiered system. This also raises the fundamental question regarding the capacity and role of government with respect to funding and providing open or limited access to higher education. In sum, governments by themselves cannot scale the heights because of politickling and insufficient funds, but arrogating to the private agencies with the task of educating the nation is not a sensible act as this is potential to jeopardize the societal systems.

What then may be the alternative? One alternative, of the many, may be strict quality control/assurance/audit systems.

**Quality Audit**

Statements on the quality of education have typically been taken for granted and seldom does it become a tenuous part of institutional policies. Moreover, the paradigm shift in education from teacher (or teaching) to learner (or learning) as manifested in open and distance learning (ODL), the WTO/GATS specifications which require transnational quality criteria and the emerging Intellectual Property Rights (IPR) regime that potentially makes education dearer in the process of knowledge commodification all have implications for quality and thus render the existing policies inadequate.
Quality in Campus Education

The traditionally perceived elements of quality in the context of campus-based education could be typically categorized as under:

- **Physical plant**: Is the plant purpose-built and/or aesthetically appealing? Does it have facilities such as library, labs, etc., for research? Are there enough teaching complexes/lecture theatres? Do the lecture theatres have multimedia facilities? Is the information and communications network efficient and effective? Are there recreational facilities/sports complexes/eateries? Does the physical plant satisfy safety standards and security specifications? Does the plant meet the needs of the differently-abled? Is the plant eco-friendly?, etc.

- **Institutional reputation**: How aged or modern is the institution? Does it have an enviable tradition/history? What is the stature of its past and present staff in the society/academia? Is the staff-mix international in nature? Do the staff members represent an intellectual force to reckon with locally and internationally? Do their peers, students and others, recognize the faculty members as scholars or/and effective teachers? What is the social environment within the institution? Does the institution assume any responsibility to maintain and upgrade the quality of life of students and staff members? What is the level of institutional commitment to make available the required resources to accomplish the goals set?

- **Student entry and exit criteria**: What are the student-admission criteria/entry requirements in use? How rigorous is the assessment/evaluation process? What are the pass-rates? How employable are the students?

- **Learning environment**: Are the existing programs/courses relevant and appropriate to the local contexts? Do they prepare the students for global contexts as well? Are the aims/objectives of the programs/courses clear to all the stakeholders? What is the nature of student-teacher ratio and interaction? Do the staff members enjoy academic autonomy? How are the contents/methods of programs/courses and assessment of student performance decided? Are the students involved in curriculum framing, and in the assessment of teachers, at any stage? What is the extent of technology used for teaching/learning? Are the faculty/staff members and students technology-oriented?, etc.

- **Campus discipline**: How often has the institution to grapple with industry actions or disturbances of classes? Are there confrontations between students and staff members or among them? How many times have interventions of law-enforcers been sought? How fair are the proctored examinations, and have they been conducted without difficulties?

Obviously, the categories listed above, reflecting the quality elements generally expected of campus educational systems, are not intended to be exhaustive. But, they are certainly illustrative of the common elements that contribute towards interpreting quality and framing quality-auditing policies/procedures with regard to place-bound education.

While some elements under each category listed above represent the quality accrediting agencies will look for, some others satisfy the quality criteria set by the institutions themselves to the extent that they are in synchronization with their established value structures. Seldom, if any, however, do institutional policies on quality address/accommodate the concerns of students. Generally, accrediting agencies are “hesitant to look at course quality, a primary point of interest for consumers. There are indeed practical problems – primarily insufficient resources – to implement these finer levels of quality assurance. If we agree that the course needs to be added as a unit of analysis, how do we construct a quality assurance process that is doable?” (Twigg, 2001). In other words, the parameters accrediting agencies, governments, etc., tend to employ to assess quality need not necessarily be the same as those the practitioners or learners hold, and vice versa. Not only must, therefore, institutions
put in place proper mechanisms to look into this anomaly in the prevailing approach to quality, but also put an end to applying the quality criteria evolved for campus education to ODL and this assumes importance in the GATS context.

**Quality in Traditional ODL**

By traditional ODL is meant the educational environment which is predominantly print-based. While categories such as physical plant, learning contexts, institutional reputation, etc., can be seen as contributing to evolving the quality criteria for traditional ODL, as is the case with campus education, quality indicators do differ. Listed below, for example, are some of the concerns that represent the quality indicators of traditional ODL, most of which remain inessentials in the context of campus education:

- **Learning materials**: How to judge the difficulty level of the learning materials? Is the content dense? Are the materials designed in such a way as to facilitate self-learning? What are the criteria to judge the self-learnability of the materials? Who judges it and how? Are there developmental or self-assessment questions embedded in the materials? Do they contribute to learning? Do learners get feedback on these questions, how and how soon? Is the material learner-active? Is the presentation lucid? Are the materials subjected to peer-review? How effective is the layout (in case of print materials) or format (in case of digital materials) in terms of facilitating learning? Do the materials have illustrations, different colour, simulations, visuals, etc., to make the learning process enjoyable?

- **Materials dispatch**: After registration, when do learners receive the materials? Where do they collect the materials? Are the learners informed of the material-dispatch schedule? What is the mode of dispatch – ordinary mail, speed post, registered post, courier, by hand or any other? Where, and when, can one buy the learning materials for personal use?

- **Assignments**: What is the purpose of assignments? Are the assignment questions clear and unambiguous? Are the instructions to learners clear? What should be the type/level/format of questions? Does it contain any marking scheme? Who marks the assignment responses? Is there any scope for monitoring assignment evaluation? When do learners get the feedback from the markers/tutors? Is there any rationale for the turn-around time?

- **Academic counselling**: Are the learners/tutors aware of what is expected of them in an academic counselling session? How are these sessions made available – at a distance or face-to-face? How far is the sites/classrooms, where these sessions take place, from the learners’ homes/workplaces? What may be the opportunity costs for attending these sessions? Is attendance in these sessions mandatory or optional, and what is the rationale – content requirement or any other?

- **Resources**: How do distance learners access the library books/journals, etc.? Do learners have access to electronic media, etc., if they form part of the programs?

Concerns of the kind listed above, irrespective of whether they are coalesced under the category ‘learning context’ or any other, therefore, must find a place in the framing of the policy on quality of traditional ODL. The crux is that the key quality indicators one uses to assess campus education cannot *ipso facto* be used to assess traditional ODL, primarily because the teaching/learning processes involved in both the modes are markedly different from each other. Policy makers/administrators, and others concerned, must recognize this difference, and accordingly frame policies on the quality of traditional ODL.
Quality in Online Learning

To extent this argument further, the indicators one uses to assess the quality of traditional ODL will prove to be inadequate to assess that of online learning, though the categories may remain the same. The five key indicators of quality that characterize online learning are:

i) **Learning design**: Contexts, including needs, goals and environments of learners, the subject matter, intended learning outcomes, instructional technologies, etc., must determine the online learning activities. Components such as clear statement of intended learning outcomes, appropriate selection and application of media, learning activities responsive to the learning needs of individual learners, learner autonomy in terms of time, place and pace, team approach to content creation and continuous evaluation for effectiveness, etc., thus, constitute this indicator.

ii) **Learner support**: An effective learner support services system must be in place to enable the learners to optimally use the available resources. A learner support structure that helps learners in accessing a wide range of required information, various resources including library and other technical facilities, learning assets to suit their learning styles, etc., thus form this indicator.

iii) **Institutional commitment**: Online learning policy must be an integral part of an institution’s overall policy framework. This indicator accordingly comprises the extent of administrative and financial commitment institutions make towards online learning, including the maintenance of programmes, research, staff development/promotion and the equitable treatment of learning done on-campus and at a distance.

iv) **Learning outcomes**: Online learning programmes must organize learning activities around demonstrable learning outcomes, assist learners to achieve these outcomes, and assess learner progress by reference to these outcomes. The focus of this indicator is thus on the key functions of learning outcomes in the overall design.

v) **Technology**: A technology infrastructure plan defining the technical and related requirements needed to support the learning activities must be in place. Addressing to matters such as security to ensure the integrity and validity of information shared, the level of interactivity among all elements of a learning environment, the availability, accessibility and equity of technology being used/contemplated, the code of conduct in the use of technology, etc., thus form this indicator (Adapted from ACE, 1996).

These categories are deceptively identical to the ones listed in the context of campus education and those implied in the context of traditional ODL. Significantly, however, the concerns expressed in terms of indicators in the context of online learning are close to traditional ODL but are markedly different from those of the campus education. It is evident that the underlying quality concerns of both the online and traditional ODL contexts are analogous insofar as they deal with the basics of instructional design and student learning. Obviously, that which distinguishes them is the indicator pertaining to technology, i.e., the learning environment.

The framework of quality indicators the Institute for Higher Education Policy (IHEP) advances also highlights this overlap as well as the distinction, as given below:

i) **Institutional commitment**: Is a technology (IT) policy in place? Does it cover electronic security measures (i.e., password protection, encryption, back-up systems, etc.) to ensure the integrity and validity of information? Is the delivery system in terms of technology foolproof? Is the technology being used in the course reliable? Is the technology being used (e.g., web sites, course management software) learner-friendly? Is there a robust support system to maintain the infrastructure? Is a policy on intellectual property (IP) in place?
ii) **Courseware production/delivery**: Are there guidelines for course development, design, and delivery? Are these guidelines valid and reliable, and followed? Does learner access and/or learning outcomes, and not technology availability, determine the technology to be/being used for course delivery? Is the learning content/design reviewed periodically to ensure their compliance to programme standards? Does the course design take into consideration learning styles of students? Does it facilitate students to engage in analysis, synthesis and evaluation as part of their course and programme requirements? Is the content current and relevant to satisfy learner needs in terms of their educational and professional goals?

iii) **Course structure**: Do learners have course information, outlining course objectives, concepts/ideas and learning outcomes, in clearly written, straightforward statements? Do learners have sufficient access to learning resources (e.g., virtual and physical libraries, databases)? Are course expectations, including the time for assignment submission, etc., clear to the learners? Is the course structured in such a way as to match the course experience with learner and course expectations?

iv) **Teaching/learning transaction**: Do learners get pre-enrollment advice to assess their access to the minimal technology required and their motivation and commitment to learn at a distance? Are the learners encouraged for independent learning to set the self-pace, as well as collaborative learning for decision-making, problem solving, etc? Is the interaction among learners and between them and instructors through various media encouraged? Are the learners and tutors clear about the purpose of assignments and learning activities? Is the feedback on assignment responses constructive and given in time? Do learners get sufficient help just when they require it?

v) **Student support services**: Do learners get information about programmes, including admission requirements, tuition and fees, books and supplies, technical and proctoring requirements, student support services, etc., in time? Are learners provided with hands-on training and information to aid them in securing material through electronic databases, inter-library loans, government archives, news services and other sources? Do learners have continuous access to technical assistance, including detailed instructions regarding the electronic media used, practice sessions with, and convenient access to, learner/technical support staff? Are learners’ questions answered accurately and quickly? Is a structured system in place to address learner complaints?

vi) **Faculty support services**: Is technical assistance in course development available to faculty to develop/deliver courses online? Is the mechanism in place to assist faculty members in the transition from classroom teaching/traditional distance teaching to online instruction? Is the mechanism in place to assess the faculty members during this process of transition? Are faculty members provided with sufficient resources to deal with issues arising from student use of electronically accessed data?

vii) **Programme evaluation**: Is an assessment system in place for formative and/or summative evaluation to assess the educational effectiveness of the courses? Is the evaluation system robust enough to accommodate the inputs from all the stakeholders? (Adapted from IHEP, 2000).

One category that is conspicuously absent from the IHEP list of indicators, rendering it incomplete is that which pertains to technology. However, one significant contribution that this list of quality indicators makes is in terms of the category pertaining to the level of support institutions give to the faculty members for the implementation of online learning. This category gains importance given the fact that the amount of training or retraining faculty members must receive on a continuous basis for effective implementation is generally ignored, resulting in faculty apprehensions and resentment. Any system of learning, however sound its conceptual framework and meaningful its overall aims may be, is bound to meet with failure if the staff members are not prepared for the job, and a support system is put in place. Establishing a sound faculty support services system to create the content and deliver it online must, therefore, be one of the priorities of any institution embarking on, or embracing, online learning, and this must form a part of the list of quality indicators. In addition, the quality framework
must include learner concerns. For example, such aspects as equity, bandwidth, etc., are a worthy contribution to the debate on the quality auditing of online learning.

**Framing Quality Auditing Policy**

The foregoing discussion unequivocally points to the following facts:

i) Key quality indicators do differ, depending on whether the educational system is place-bound learning, print-based ODL or online/distributed learning, in spite of the fact that the end-goal is to foster and facilitate effective learning. It is imperative for institutions to recognize this variance and accordingly accommodate appropriate quality indicators, if their quest for quality maintenance and improvement is to be accomplished.

ii) An application of key quality indicators evolved to assure/audit the quality of ODL environments to campus education will help improve the quality of the latter, as the focus of the former is inherently more on learning/learner than on teaching/teacher. But the reversal, which is the current practice, will do more harm than good.

iii) Key quality indicators generally accommodate the concerns of institutions/accrediting agencies and, more often than not, skirt around those of learners.

To frame a robust policy of quality assurance and audit, no matter what the learning system is, the mindsets/attitudes of policy makers/administrators must change in such a way as to recognize that:

i) Learner concerns are the core of the policy. In any learning context, some learners do well and get through the system successfully and some others will not. In other words, learners can be successful despite a bad system, and similarly they can be unsuccessful despite an excellent one. The crux is that success or otherwise largely depends on the amount and the nature of efforts learners make for learning, and the teachers can only be ‘guides on the side’. (And, this indeed is the underlying philosophy of distance education). Precisely for this reason, pass-rates of learners, for example, can be just one, but a weak, parameter/indicator to measure the quality, success or reputation of an institution. What institutions must be striving for, therefore, is to provide learning experiences that make learners feel that they do spend quality time at the institution during their academic journey, and will cherish it in future. This should be the driving force behind any policy on quality.

ii) One size does not, and will not, fit all. Besides learner concerns, the uniqueness of the learning systems must determine quality indicators. Drawing quality criteria from a system of education that is familiar and proven in its unique context to frame policies for a system that is not only innovative in terms of learning environments but also is still evolving is seemingly less cumbersome and, therefore, may sound legitimate, but will prove to be woefully inadequate to serve the purpose intended. Policy makers/administrators must accept this reality, however established the current practice may be. There is no harm though to adapt existing quality indicators pertaining to such categories as institutional commitment (including finances), technology, student support services (including training), instructional design, development and delivery, learning content, intellectual property policy, faculty and staff support services, equity, evaluation, etc., to suit a particular context.

**Conclusion**

Given the difference in the delivery modes and learner profiles, the guidelines developed for assuring and auditing the quality of campus education, when applied to off-campus contexts, will prove to be wanting and detrimental to distance learners. Embarrassingly, however, this remains an established practice particularly in dual/mixed mode institutions, and it must no longer be encouraged. Despite the fact that advancements in information and communications technology (ICT) have been bridging
the gap between campus and ODL contexts, it must be recognized that the concerns, emanating from the teaching/learning processes involved in these contexts, remain different, and that must be reflected in the policy on the quality of ODL, and therefore the indicators/benchmarks that guide quality auditing. The other challenge for institutions is to find ways to accommodate the concerns of all the stakeholders in their policy statements on quality, breaking away from the established practice of deriving policies on quality from the traditionally held institutional norms and the requirements of accrediting agencies. A formidable task indeed it is. But, when undertaken, the exercise will prove to be worthwhile, as it enables institutions to articulate and implement robust quality management systems. There is no choice but to carry this out if ODL systems have to survive in the GATS atmosphere.

The whole discussion must, therefore, be seen against the fundamental issue of the capacity of the developing countries to participate effectively in the global trading system and to be equal members in the WTO. Strong sentiments exist about the potential for trade rules to make poor countries poorer, instead of narrowing the gap between developed and developing countries. The perceived injustice regarding the expectation that poor nations are expected to remove trade barriers while rich nations retain barriers on certain goods, contributes to the strong reactions of some developing countries about GATS in general. In sum, the liberalized trade on higher education is ambivalent in that for some it is an opportunity and for some others it is a threat. As much as GATS is a liberating force in the sense it facilitates education to whoever aspires for it, it is a restricting force as a majority who aspire for education will be left out.

Only when do countries establish sound systems of quality auditing, would they be able to survive in the emerging WTO/GATS context.

References

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INTERACTIVE COMPUTER SIMULATION TO SUPPORT TEACHING OF BIOLOGY IN DISTANCE LEARNING

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In the open and distance education environment, where teacher-student interaction is very limited, there should be more emphasis in promoting student’s initiatives. Interactive computer simulation can help the student gain an understanding of a subject learnt at a distance. Students can carry out their respective assignments. It simulates procedures of laboratory work efficiently. It can also visualize a complicated and even a hard-to-imagine scientific concept.

The Department of Biology of Universitas Terbuka initiated an interactive computer simulation to support student learning process. The subjects are genetics, microbiology and biochemistry. The objectives of the interactive computer simulation are to better ensure student preparedness to carry out real laboratory practice. The computer simulation presents a step-by-step procedure of a simulated laboratory practice. This simulation develops student’s comprehension of the procedure and its relation to the theoretical framework.

**Introduction**

A characteristic of open and distance learning (ODL) is separation of teacher and student. Students learn by means of media. These media enable teaching and learning over a distance in the first place (Peters, 2003). Thus, media is a one of the most important component of ODL.

Distance university contributed to reducing the costs of studying and the establishment of mass higher education (Daniel, 1998). It spreads knowledge among people in a more cost-effective way.

Universitas Terbuka is the sole open and distance university in Indonesia. It was declared operational in 1984. It has 36 regional offices throughout the country. The number of active students are around 200000. There are four faculties, one of which is the Faculty of Mathematics and Natural Sciences.

The Department of Biology in the Faculty of Mathematics and Natural Sciences conducts undergraduate degree programme by distance learning. Since its inception in 2001, it has had around 300 students. Most students live in urban areas across Java and Sumatra. Some students even live as far away as in Batam Island (in Malacca Strait), and Papua, the easternmost part of the country.

There are 62 courses in the department. The critical components of a course are learning material, learning support and learning assessment. Most learning materials are produced by course team which includes outside subject matter expert. Besides subject matter expert, a course team includes multimedia expert and instructional design expert.

An indispensable activity of learning biology is laboratory work. In UT, laboratory practice for biology students is conducted in partner universities, which are conventional universities. The partner universities are:

- Jakarta State University in Jakarta  
- Pakuan University in Bogor, West Java  
- Indonesia Education University in Bandung, West Java  
- Surakarta State University in Solo, Central Java  
- Yogyakarta State University in Yogyakarta.

Each partner university cooperates with respective UT regional office. Each student who is registered in a regional office, should have his/her laboratory practice in partner university in the area. However,
they can also have the laboratory practice in another partner university. In addition to provide laboratory facility, the partner university also provides tutor and course material writer.

There are 14 laboratory courses in the department. The student may take it after they take the theoretical courses. These courses are as follows:

- BIOL4440 Plant Structure
- BIOL4441 Animal Structure
- BIOL4444 Avertebrate Taxonomy
- BIOL4451 Vertebrate Taxonomy
- BIOL4447 Higher Plant Taxonomy
- BIOL4446 Lower Plant Taxonomy
- BIOL4448 Plant Embriology
- BIOL4452 Animal Embriology
- BIOL4449 Plant Physiology
- BIOL4450 Animal Physiology
- BIOL4442 Ecology
- BIOL4443 Genetics
- BIOL4341 Biochemistry
- BIOL4445 Microbiology

In open and distance education system, where teacher-student interaction is limited by factors as time constrain, geographic barrier and cost. There should be more emphasise in promoting student's initiative. A solution is using an interactive computer simulation.

**Developments**

Some distinguishing characteristics of learning process in distance university are problem-based learning, resource based learning and constructivism. Those methods of learning support using interactive learning system. This is the important reason to use computer in supporting distance student.

Problem based learning (PBL) is a learning process which students are encouraged to create and develop their own body of knowledge by analysing problems presented to them. The problem is the starting point of learning (Bridges and Hallinger in Crumpacker, 2001). By means of solving problems, students learn the subject. They will eventually understand the whole knowledge through this activity.

Another concept of learning in distance university is resource-based learning (RBL), which is defined by the Australia National Council of Open and Distance Learning (NCODE) as an integrated set of strategies to promote student-centered learning in a mass education context, through a combination of specially designed learning resources and interactive media and technologies (NCODE). This concept holds a view that there are many learning resources beside teacher, textbook or laboratory, these are internet and CD ROM-based resources.

The concept modifies central role of teacher (Ryan et. al., 2000). The teacher tends to be a facilitator of learning. The teacher is no longer the only source of knowledge. Instead, the teacher is focusing more on guiding the student find out the knowledge by the student’s own experience in learning activity.

Constructivism holds that there are many meanings of perspectives for any event or concept (Duffy and Jonassen, 1992). The learners are building a personal interpretation of experience. By so doing, the learners develop their own understanding of a concept. Instruction process is not a process of transferring knowledge, otherwise it is a process of problem solving. A learning process should be a process of dealing with solving problems presented during the process. Those problem are structured
so that students gradually develop an understanding of a certain knowledge which is the objective of
the learning activity itself.

ICS support learner-centered learning process. The computer simulation can increase interactivity,
individualisation and independent learning (Peters, 2003.). It can function as game, simulation,
evaluation and tutorial.

Learning occurs by active process in memory system, which is characterised by retrieving knowledge
and skill from long-term memory to working memory (Clark and Mayer, 2003, p35). The retrieval
process is so important that without it, a knowledge stored in long-term memory is meaningless, for it
cannot be accessed and applied by the learner.

A mental management process which oversee the information processing is called metacognition
(Clark and Mayer, 2003). Metacognition consists of three steps, those are defining goals, planning
and monitoring. Each student define specific individual goals, based on his/her own objective in
learning. These goals are translated into learning plan. The student learns according to his/her learning
plan. He/she can choose any learning resources and do specific learning pathway accordingly.

Interactive computer simulation (ICS) can help student gain an understanding of a subject learned.
Students will carry out their respective assignment. It simulates procedures of laboratory work.

Computer game can be used to develop a higher thinking order among students (Sherwood, 1990).
Student may compare many activities which is ranked according to the level of difficulty. Once he/she
achieved a certain level of thinking, he/she will be motivated to keep learning.

The computer can encourage divergent and creative thinking (Dowling, 1990). Actual laboratory
practice is usually limited by time allocation and availability of facility. Yet with this simulation,
student can explore some possibility of even some high-risk experiment.

Present Status

One of the most suitable mode of ICS to support laboratory practice is simulation. There are several
types of simulations. Based on the educational objective there are two groups of simulations. Those
educational objectives are to teach about to do something or to teach how to do something. The first
group is subdivided into physical simulations and iterative simulations. A physical simulations is
characterised by a physical object or phenomenon which is represented on the screen, giving the user
an opportunity about it. Some examples are chemical bonding, photosynthesis or transmission of
electricity through power lines. Iterative or process simulation is characterised by an interaction of
learner and computer. In the simulation, time is not included as a variable.

While the groups of simulations which objective is to teach how to do something is subdivided into
procedural and situational simulations. A procedural simulation is to teach a sequence of actions to
accomplish some goal, like flying an airplane, performing a titration or diagnosing equipment
malfunctions. The student must imitate the actual procedures of operating or manipulating physical
objects. Situational simulations deal with the behaviour and attitudes of people or organisations in
different situations. It incorporates role playing. (Alessi and Trollip, 2001).

There are different types of simulation, which depends on the instructional strategy chosen by the
developer. The instructional strategy is concerned with how learners are going to learn from the
learning events and describes how learners are going to achieve the learning objective (Jollife et al,
2001). It can be considered at both micro- and macro-level. The micro-level concern with developing
instructional strategies for an individual topic, while the macro-level with developing an overall
instructional strategy for the entire learning event. At the micro-level, there are five-steps including:
pre-instructional activities, information presentation, activation of learning, follow-up and
remediation.
The pre-instructional activities include an introduction video, a text presentation and/or accompanying narration. The introduction is designed to encourage and motivate student to explore the preceeding session. It should also include a statement of the objective of the courseware.

The information presentation does not mean a contradiction to the abovementioned principle of constructivism, for the presentation is intended to remind the student of prerequisite knowledge. The main objective is contained in the preceeding step, which is the activation of learning.

In the step of activation of learning, the student does the interactive simulation. By doing the activity, they explore the previous learning experience from the long-term memory and combine it with the present simulation.

The next step is follow-up and remediation. The students can evaluate the result of his/her activity. They can step into higher order of learning, if they achieve a good result in the proceeding activity.

There are four types of presentations in simulations. These types are: choices to make, objects to manipulate, events to react to and systems to investigate (Allesi and Trollip, 2001).

Based on the types of presentations, basic actions of learner in the interactive simulations are:

- Moving viewpoints/changing the view
- Navigating through environment
- Selecting an object
- Moving an object (Brady and O'Sullivan, 1998)

Feedback about any action may be given immediately or at some later stage. There are natural feedback in a simulation that is similar or identical to what occurs in reality. Artificial feedback may provide the same information, but in a way that does not occur naturally. Regardless of how the real world works, simulation provides us the option of giving natural or artificial feedback, of immediate or delayed feedback, or of giving no feedback at all (Allesi and Trollip, 2001).

The ICS is neither a replacement nor an alternative to real laboratory practice. Otherwise, it is intended to be a complement. The student will have to do exercise with the computer simulation prior to an actual laboratory session. This is a tool which enable the student to imagine the laboratory procedure.

**Limitations**

1. Low student skill in laboratory procedure

   The procedures are presented in printed learning material, which is considered not clear enough by students. Without constant face-to-face explanation and lack of inter-students direct contacts, some students waste the laboratory session by repeating procedures.

2. Most computer simulations are not interactive enough

   Some computer-based learning material is just an imitation of traditional teaching and learning (Peters, 2003). Those are only presenting facts and procedures. It doesn’t encourage student to make a decision.

3. Low transmission rate of internet in Indonesia

   As a result of low quality of telecommunication infrastructure, the transmission rate is low. Dialing internet connection wastes student’s time and cost. Unfortunately, the better the simulation software, the bigger the software, creating more time-consuming internet connection.
4. ICS cannot replace a real life laboratory practice completely

Most biology students want face-to-face contact in their studies are not prepared to take virtual studies as a replacements (Parslow, 2005). Moreover, there are still a lot of competences that cannot be simulated by computer. Some specific skills like slicing finite specimen of plant or animal tissue must be trained in real plant and animal tissue. Placing a slide glass under a microscope to get the proper microscopic image needs special repeated training.

Innovations

In 2005, Department of Biology of Universitas Terbuka began to initiate an interactive computer simulation (ICS) to support student learning process. The topics of the simulation are genetics, microbiology and biochemistry. Selection of those topics are based on the difficulty to conduct the laboratory practice and the high cost of its facility. The objectives of the interactive computer simulation is to better ensure student preparedness to carry out real laboratory practice. Other benefits of the simulation are:

- Enable student to easily conduct the simulation anywhere and anytime, individually or collectively. The frequent simulation practice will decrease student’s mistake in the real laboratory session.
- Some experiments is time consuming, such as yeast inoculation, plant breeding and even simple experiment of bacterial staining takes time. The computer simulation does not need to be conducted in full time experiment, so the student can directly jump to the expected step.
- The simulation produces required answer to problem and procedure which is presented. This feedback enhances student’s motivation.
- By responding to computer answer, students can assess their level of comprehension. Students can repeat the procedure according to their need.

The ICS is a computer simulation which is designed to present a problem to solve. It is indeed preceded by an introduction of a topics. Then, the students are to do some laboratory procedures. There are also problems to test their comprehension of the topic.

A distinguishing characteristics of the new interactive computer simulation is its high interactivity. The simulation consisted of several steps of activities and some problems. The student’s answer to each problem create different kinds of computer’s response.

There are two kinds of problems in computer simulation, ill-structured problem and well-structured problem. Ill structured problem does not have clear and complete informations related to the problem. It contrasted to well-structured problem which have definitive answer.

Ill structured problem can motivate active learning (Kiili, 2005). It is more suited to conceptual development and problem solving development (Oliver and Omari, 1999). The simulation is actually an ill structured problem. It contains alternative response for each possible student answer. Whether they produce the right answer or not, the computer always give further feedback. The student can create and try every possible alternative to each problem.

There are several steps in developing the ICS. The first step is planning. The plan is based on course syllabus of each course. The three courses are chosen considering their delicate laboratory procedures, expensive cost and need of sophisticated laboratory facility. We also organize, allocate budget and arrange time schedule. The products are flowchart and script for each topic.

The flowchart and scripts depicts the sequence, logic, feedback and interactivity of the resulting computer simulation. A preceeding information is always presented, prior to every interactive simulation. It means that student is supposed to recall previous learning experience and progress to appropriate level of study. He/she can choose any topics based on his/her study need.
The next step is programming, which means creating an interactive computer programme that simulate a laboratory practice. The computer programme is supported by graphic, video and audio. Graphic and video show the real and ideal procedure of experiment. Afterward, the student will have to be able to solve the problem, which is represented by the simulation.

Each simulation presents real laboratory steps and resulting circumstances. The students experience solving problems. The experience is an important way of study in which students will create their own body of knowledge. The knowledge itself is the result of their effort to solve problem.

The problem presented in the simulation enable student to achieve higher thinking order. They can relate various problem, data, and feedback. Eventually, the process will arrive at students understanding of theoretical background of the laboratory procedures.

An important advantages of any simulation is that it motivates students. By achieving any level of study, they are challenged to progress into higher level of study. Students can bypass any subtopics which are regarded as too easy or already understood. Therefore, they can study by their own need.

The ICS courseware is distributed to students in CD-ROM. It can also be distributed in the internet. Unfortunately, the low bandwidth of internet connection and even inaccessibility of internet connection in some areas will discourage students to use the courseware.

The simulation can be conducted by a group of students. Conducting the simulation in a group is a way to improve teamwork among students. Students in a group can discuss what they have already done in the simulation.

The ICS topics consists of genetics, microbiology and biochemistry. The genetics ICS topics focuses at epitasis. The biochemistry topic focus at amino acid separation by paper electrophoresis. The microbiology topics consists of morphology and staining of bacteria.

**Genetics ICS program**

The Department of Biology of UT offer BIOL4219 Genetics course as one of the most important courses. It is one of the prerequisite course of the student final assignment.

The programme is to describe the basic principle of genetics and to prepare the students to master laboratory procedures. The students may take the laboratory session only after they took the course.

<table>
<thead>
<tr>
<th>Gamet</th>
<th>Male Agouti Mouse Alele</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HA</td>
</tr>
<tr>
<td>Female Agouti</td>
<td>HA</td>
</tr>
<tr>
<td>Mouse Alele</td>
<td>Ha</td>
</tr>
<tr>
<td></td>
<td>hA</td>
</tr>
<tr>
<td></td>
<td>ha</td>
</tr>
</tbody>
</table>

Fill in the blank table with correct alele, and move the correct colour according to the mouse phenotype

**Figure 1: An example of Punnet Square**
The genetics ICS programme is based on several specific competences as follows:

- Mendel’s First Law
- Mendel’s Second Law
- Description of Epistasis
- Recessive epistasis
- Double recessive epistasis
- Dominant epistasis
- Double dominant epistasis
- Dominant and recessive epistasis

The ICS begin with the objective of the programme, which is the specific competences themselves. It was meant to enable the student to know precisely the objectives of the activity. It was followed by the main menu and some explanation video materials of various living creatures.

The description of epistasis is followed by explanation of each type of epistasis. The explanation is not only a presentation of genetics mechanism, but also some interactive problem. The students are required to fill in a Punnet Square, which is a popular way to explain genetics equation. It is a square which has to be filled by correct genotypic formula and phenotypic trait. The way the student answer is by writing down the correct word representing each alel, and by removing a coloured block representing a phenotypic trait. If the student fill in the right answer, there will be a positive response. The positive response is a cheerful sound. The wrong answer will produce the negative response, like sorrowful sound.

The objective of the courseware is to explain epistasis as a deviation of Mendel’s Law. Another objective is to explain some details of metabolism aspect of epistasis.

**Microbiology ICS program**

Microbiology course deal with submicroscopic creatures which need special care to avoid contaminant. This special precautions deserves very strict procedure to be taken by students. Even some failures is resulted by simple mistake. Another important precautions is regarding the sterilization, especially in working with pathogenic microorganism.

To avoid these failures, students must be prepared to conduct steps of laboratory procedures. Beside preparing students, the animation can show model of some phenomenas in microbiology. It can bridge the laboratory practice with the theoretical explanation.

**Figure 2: Gram staining simulation**

1. Place the cursor on the Bunsen
2. Place the cursor on the glass slide
3. Place the cursor on the Ose stick
4. Place the cursor on the bacteria
The Microbiology ICS is complementary courseware of BIOL4223 Microbiology. The topics are:

1. Morphology and size of bacteria
2. Characteristics of Gram positive and Gram negative bacteria
3. Gram staining
4. Spore staining

At first, the student can see a video of actual laboratory procedure. The video is showing actual laboratory practice. The video can show standard laboratory practice of biology students of UT for partner universities.

After the student learn some information in text and video presentation, they can try to make some simulation experiments in animation. Each student answer will result in either positive or negative response. The positive response is a cheerful sound. The wrong answer will produce the negative response, like sorrowful sound.

**Biochemistry ICS program**

Biochemistry laboratory practice is characterized by expensive material and tools. It limits students effort to reach satisfying result. Beside a competence in laboratory procedure and techniques, students may find it difficult to understand some basic concepts of biochemistry. The ICS is beneficial to help students overcoming it by using animated molecular model.

The program intends to present some basic concepts of amino acid structures and the related laboratory practice. The topics of the Biochemistry ICS Program are:

1. Definition of amino acid
2. Three dimensional structure and amino acid model
3. Fundamentals and method of amino acid analysis
4. Tools of amino acid identification by paper electrophoresis
5. Method of amino acid identification by paper electrophoresis

![Simulation of Building a Amino Acid Molecular Model](image)

Make an amino acid molecule model based on the model on the right. Use the appropriate atom on the left. Click the mouse on the right atom, drag it to the middle, join it with other atom.

**Figure 3: Simulation of building a amino acid molecular model**
The concepts of amino acid structures is described by 3D animation. The student can try to develop a model of amino acid molecule by combining appropriate atom and functional groups available in the presentation monitor. The components of a molecule is presented in the monitor display. The student may choose correct molecule component based on his/her previous knowledge. If the student fill in the right answer, there will be a positive response. The positive response is a cheerful sound. The wrong answer will produce the negative response, like sorrowful sound.

The student can see a video of actual laboratory procedure, to show them the actual skill that is needed to perform the activity. Then the student will has to complete an animation of laboratory procedure.

The student can also get some information regarding the amino acid by viewing the video and photo presentation. The video describes actual laboratory practice of the similar topics.

**Conclusion**

The ICS can be used to prepare a student to comprehend laboratory procedure. The more a student is capable to work according to the simulated procedure, the more the student is ready to work in the actual laboratory session.

By means of ill structured problem presented to student, the ICS can also improve student's understanding of theoretical concept.

There should be an emphasis toward creating multiple-user type simulation, which can be used both on-line and off-line.

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AN ANALYSIS OF LEARNING STYLES OF DISTANCE LEARNERS AT THE INSTITUTE OF EDUCATION DEVELOPMENT, UNIVERSITI TEKNOLOGI MARA, MALAYSIA

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Abstract

Presently, no information could be obtained on the learning styles of distance learners as it has not been studied before. A study was carried out to identify the learning styles of distance learners at the Institute of Education Development, Universiti Teknologi MARA, Malaysia. Felder’s Learning Styles Index (LSI) was used in the study. Results of the study were used to make comparison and correlation analyses between learning styles and academic achievement, programme of studies, gender and income. One hundred and sixty two students responded to the online questionnaire. The study showed that 35.5% students preferred visual learning style followed by 29.6% sensory, 14.2% active, 0% verbal and 2.5% intuitive. The male students were found dominant in visual learning style as compared to the females who were sensory dominant. The students who were majors in banking tended towards sensory style as compared to finance and business studies students who were inclined towards visual style. While the mass communication and public administration students dominated in visual and sensory styles. The higher income students preferred more visual style as compared to the middle income who were dominant in both visual and sensory. The higher achievers were found to be better disposed towards visual as compared to low achievers who were sensory dominant in style. The learning styles were not significantly different between genders, programme of studies and semesters. It was also found that there was no significant relationship between learning styles and academic achievement. This paper discusses in detail the implications of the various learning styles on students of distance mode of education.

Introduction

Learning styles can generally be defined as a group of attributes and behaviour that determine the way or approach of learning preferred by an individual (Honey & Mumford, 1992). Thus it is a combination of factors characterized by cognitive, affective as well as psychological (Duff, 2000). Normally, individuals differ in their views and attitudes towards a situation, thus the way or styles they learn are also different.

Various learning styles models have been forwarded by many researchers working in this field of research. Among them is by Kolb (1976), that was based on learning cycle. Kolb identifies four types of approaches preferred by many individuals, they are active experimentation, reflective observation, abstract conceptualization and concrete experience. The four approaches parallel to the levels of learning cycles that begins with taking action, followed by seeing results, thinking about results and finally planning for the next time.

Based on the Kolb’s model, Honey and Momford (1985) proposed their own model that individual possesses four learning styles, the activist, reflector, theorist and pragmatist styles. Each individual possesses the four styles, but differ in term of degree of preference of one style than the others.

Richard Felder (1993) proposed a five dimension dichotomy learning style that is related to the information transfer process to an individual. The first dimension is on the most preferred type of
information to be assumed, that is either sensory or intuitive information. The second dimension is on the most effective mode of senses to obtain information; either visual or verbal. Then, followed by the most preferred arrangement or organisation of information; either inductive or deductive. The fourth dimension is about the most preferred approach to process information; either actively or reflectively. The final dimension is on the advances of understanding the information; either sequentially or globally.

No matter what model is referred, since learning style is a composition of cognitive, affective and psychological attributes that guides individual to interacts and reacts on learning environment, it undoubtedly affects the learning outcomes of an individuals (Syed jamal Abdul Nasir Syed Mohamad, et al., 2002). Students whose preferred learning style matched the teaching style of his teacher tend to store the information longer, use it more effectively, more positive towards his course, in contrast to others whose learning style mismatched his teacher’s (Felder, 1993).

Since learning styles affect significantly an individual’s learning outcomes, many studies have been carried out on learning styles of students at various levels of study, relating the results to various academic variables and demographic profiles. In the present study the respondents are e-Distant Learning (e-DL) students of Universiti Teknologi MARA (UiTM), Malaysia. The study adopted the Felder (1993) learning style model. Index of Learning Styles (ILS) questionnaires developed by Solomon and Felder in 1993 was used in the study to evaluate the respondents’ preference on the five dimension of the model. The reliability of the ILS has been tested, and used by many researchers in the studies.

**Problem Statement**

UiTM e-DL students attended their studies off-campus and on-line, interacting with the respective lecturers on study modules through internet. They also attended monthly face-to-face seminar with the respective lecture in charge of the module. The mainly composed of adult learners, with their own carriers, and different background, registered for various programmes offered by the university, at diploma as well as first degree level. Hence, it is expected that they would prefer different learning styles. At the same time the adopted learning style can vary based on previous experience and current environment (Honey and Mumford, 1995).

The course modules prepared for the e-DL students most often produced without taking into account the students preferred learning styles, or somewhat bias towards one dichotomy dimension of learning styles. This could partly be attributed to the lack of data on students’ preferred learning styles. Thus, there might be great possibility that the presentation style of the module is antagonistic to the learning style of the majority of students. The implication of this situation is very obvious.

**Objective**

The main objectives of the present study are:

i. To identify the distance learners’ learning styles.

ii. To make comparison and correlation between learning style and programme of studies, level of study and student’s profiles.

iii. To determine the correlation between learning style and academic performance.

**Methodology**

The total population of e-DL students in the present study is 2000, enrolled in various programmes at diploma and first degree levels. Based on the formula suggested by Cohen (2001) a total of 322 students were selected based on stratified random sampling method. Stratified method was used to
select respondents enrolled in diploma and degree levels. In this study a total of 162 students returned the completed and perfect questionnaire. This number was achieved after follow-up was done to ensure they return the questionnaires.

The study tool used was the ILS questionnaires developed by Felder and Silverman (1993). The questionnaires contained 44 items. Eleven items each arranged randomly are able to identify the respondent’s learning styles out of the four domain; active/reflective, sensory/intuitive, visual/verbal and sequential/global.

The questionnaires forms were distributed to students during the monthly seminar session. The questionnaires has been proved to be reliable by Zywno (2003) as a tool for behavioural study. The same author has also reported that the questionnaires has high construct validity.

Each respondent’s learning style preference was determined by totaling up the style in each domain, then the difference of the totals within the domain was determined. Learning style with the highest score (total) corresponds to the preferred style. The data was then analysed using SPSS. The overall analysis of the respondents’ learning styles was descriptively analysed using percentage and mean. To analyse the correlation between learning styles and programmes, semesters of study and academic achievements chi-squared test was used. Lavene test was also carried out to explore the variation between the learning styles.

**Results**

Out of 220 questionnaires returned by the respondents, only 162 can be accepted for analysis. Out of this, 63 are male respondents and 99 female. Majority of them attending semester 5 (27.2%), semester 6 (18.5%) and semester 3 (13.6%). In terms of programmes attended, 62.5% of the respondents attended Diploma in Public Administration programme, 15.4% Diploma in Business Administration, 8.6% Diploma in Accountancy and 8.0 % attending Bachelor in Business Administration, majoring in Marketing. In term level of study, 87.1% respondents are at diploma level.

As for monthly income, the majority (58.6%) of respondents fall in the RM 1001 – RM 2000 range, that is the salary range of worker with Malaysian Certificate of Education qualification. This is followed by monthly salary of less than RM 1000 (21.0%). Only 13% of respondents take home between RM2001 – RM 3000 monthly, while 7.2% respondents were paid more than RM3000 per month.

In terms of academic performance, majority (49.4 %) of respondents fall into the CGPA range of 2.50 – 2.99, while 32.1% in 2.00 – 2.49 range. Around 13% in the 3.00 – 3.49 range, while only 3.1% obtained CGPA more than 3.50.

**Most dominant learning style**

Based on the Felder model, the score for each style of each student was measured using 1 to 11 scale. The higher the score the higher the preference towards the respective style. Results of the study show that the most dominant style is visual (35.2%), followed by sensory (29.6 %). A reasonably high preference was also shown on active style (14.2%) and sequential style (8.0%). However, preference towards other styles were low; 5.6% for global, 4.9% for reflective and 2.0% for intuitive. None of the respondents showed any preference towards verbal style.

**Learning style according to gender**

Since both gender variables and learning styles variables are nominal data, non-parametric analysis, the chi-squared test for probabilistic difference was used to test the following hypothesis,
H0: No difference in learning style between male and female respondents.
H1: There are differences in learning style between male and female respondents.

Table 1 shows the results of the chi-squared test. It shows that the probability value $p = 0.157$ is higher than 0.05. Therefore, we can not reject $H_0$. Thus is can be concluded that there is no difference in learning style between male and female students.

Table 1: Chi-squared test for gender

<table>
<thead>
<tr>
<th>Difference between gender for:</th>
<th>Statistical Value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Styles</td>
<td>9.313</td>
<td>0.157</td>
</tr>
</tbody>
</table>

Learning style according to income

Again, chi-squared test was used to test the correlation to evaluate the hypothesis

$H_0$: No correlation between learning style and income.
$H_1$: There is correlation between learning style and income.

Table 2 shows the results of the chi-squared test. It shows that the probability value $p = 0.536$ is higher than 0.05. Therefore, we can not reject $H_0$. Thus it can be concluded that there is no correlation between learning style and students’ monthly income.

Table 2: Chi-squared test for income

<table>
<thead>
<tr>
<th>Correlation between income for:</th>
<th>Statistical Value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Styles</td>
<td>28.648</td>
<td>0.536</td>
</tr>
</tbody>
</table>

Learning style and fields of study

Since both fields of study variables and learning styles variables are nominal data, non-parametric analysis, the chi-squared test can be used to evaluate the correlation of the following hypothesis,

$H_0$: No correlation between learning style and students’ fields of study.
$H_1$: There is correlation between learning style and students’ fields of study.

Table 3 shows the results of the chi-squared test. It shows that the probability value $p = 0.896$ is higher than 0.05. Therefore, we can not reject $H_0$. Thus it can be concluded that no correlation between learning style students’ fields of study.

Table 3: Chi-squared test for fields of study

<table>
<thead>
<tr>
<th>Difference between field of study for:</th>
<th>Statistical Value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Styles</td>
<td>25.778</td>
<td>0.896</td>
</tr>
</tbody>
</table>

Learning style and semester attended

Again, chi-squared test was used to test the correlation between learning styles and semester attended by students. The test was used to evaluate the hypothesis

$H_0$: No correlation between learning style and semester attended.
H1: There is correlation between learning style and semester attended.

Table 2 shows the results of the chi-squared test. It shows that the probability value $p = 0.465$ is higher than 0.05. Therefore, we cannot reject $H_0$. Thus it can be concluded that no correlation between learning style and the semester attended by students.

**Table 4: Chi-squared test for semester attended**

<table>
<thead>
<tr>
<th>Correlation between semester attended for:</th>
<th>Statistical Value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Styles</td>
<td>66.348</td>
<td>0.465</td>
</tr>
</tbody>
</table>

Analysis of variance was also carried out to compare students learning styles attending various semesters. Levene test was applied to ensure that analysis of variance can be carried out, since the assumption of equal variance is important before analysis of variance can be carried out. The hypothesis was focused as below

$H_0$: Variance for variable semester is identical.

$H_1$: Variance for variable semester is different.

Table 5 shows the results of Levene test. The p-value obtained was 0.320, that is larger than 0.05. Thus $H_0$ is accepted at significant level 0.05. This means that the variance of variable semester is the same, hence analysis of variance can be carried out.

**Table 5: Results of Levene test**

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.160</td>
<td>0.320</td>
</tr>
</tbody>
</table>

Here, the analysis of variance carried out was to test the hypothesis

$H_0$: No difference between learning style and semester attended.

$H_1$: There are differences between learning style and semester attended.

Based on the p-value in Table 6 for analysis of variance, it was found that $p = 0.274$, and this is bigger than 0.05. Thus it can be concluded that there is no difference in learning style preferences for various semesters attended by students.

**Table 6: Analysis of variance for semester attended**

<table>
<thead>
<tr>
<th>F value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.277</td>
<td>0.274</td>
</tr>
</tbody>
</table>

**Learning style and academic achievement**

Since the variable academic achievement and learning styles are both ordinal and nominal data, non-parametric analysis that is chi-squared test for correlation between both variables will be used to test the hypothesis

$H_0$: No relation between learning styles and academic achievement.

$H_1$: There is relation between learning styles and academic achievement.
Based on the p-value of chi-squared test in Table 7, it was found that $p = 0.162$, and higher than 0.05. Thus, it can be concluded that there is no relation between learning styles and academic achievement.

**Table 7: Chi-squared test for academic achievement.**

<table>
<thead>
<tr>
<th>Relation between academic achievement for:</th>
<th>Statistical value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning styles</td>
<td>30.722</td>
<td>0.162</td>
</tr>
</tbody>
</table>

Analysis of variance was also carried out to compare students learning styles with academic achievement. Levene test was used to test the equivalence of variance below.

$H_0$: Variance for variable academic achievement is identical.

$H_1$: Variance for variable academic achievement is different.

Table 8 shows the results of Levene test. The p-value obtained was 0.066, that is larger than 0.05. Thus $H_0$ is accepted at significant level 0.05. This means that the variance of variable semester is the same, hence analysis of variance can be carried out.

**Table 8: Results of Levene test**

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.029</td>
<td>0.066</td>
</tr>
</tbody>
</table>

The analysis of variance carried out was to test the hypothesis

$H_0$: No difference between learning style and academic achievement.

$H_1$: There are differences between learning style and academic achievement.

Based on the p-value in Table 9 for analysis of variance, it was found that $p = 0.305$, and this is bigger than 0.05. Thus it can be concluded that there is no difference in learning style preferences academic achievement of students.

**Table 9: Analysis of variance for semester attended**

<table>
<thead>
<tr>
<th>F value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.209</td>
<td>0.305</td>
</tr>
</tbody>
</table>

**Discussion and Conclusion**

Learning styles has been identified as one of the main contributing factors to the effectiveness of an individual learning process. Thus the present study focused on the preferred learning styles of e-DL students of UiTM and its relation to the respondents background such as gender, programme attended, semester of study, academic achievement as well as monthly income.

Based on the results of the study, generally there is no correlation between the studied variables and learning styles adopted, based on the Felder model. However, two main dominant learning style adopted by respondents are visual and sensory. The study shows that no significant difference on the two learning styles preference based gender, academic performance, semester and income of the respondents. The information should be used or taken into account in the planning for e-DL students learning activities. The plan includes preparation of modules, conducting seminars, as well as implementing of virtual interaction with the respective facilitators. The study also brought up a clear
picture to the management and teaching faculty that the scope of learning style for this group of students is very wide. Plan should be done strategically to optimise the effectiveness of the students’ learning process.

References


APPLICATION OF COGNITIVE DISSONANCE THEORY TO REDUCE DROPOUTS IN DISTANCE EDUCATION SYSTEM

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Abstract

The Distance Education System has taken the shape of a gigantic and intricate system. Gigantic because it has huge number of students, programmes, courses, operations and problems in managing them. It is an intricate system as there are lots of complications in ensuring support to the large number of students. While many things go to its advantage, there are some things, which work as disadvantages. For example, there are a lot of cases of students dropping out midway during their educational sojourn.

Most students drop out because of personal circumstances, initial expectations, quality of college facilities or to take up employment, etc. On the other hand, students find that good curriculum design, teaching methods and teacher-student and student-student relationships will have greater impact on dropout rather than the measures that improve facilities. The primary goal of this paper is to study the reasons for student dropout and suggest measures to reduce dropout. This paper applies Cognitive Dissonance Theory and tries to build a model with the help of ICT that can be employed in the Distance Education System (with special reference to IGNOU) to reduce the dropout rates.

Introduction

The Distance Education System has taken the shape of a gigantic and intricate system. Gigantic because it has huge number of students, huge number of programmes/courses, huge number of operations and also huge number of problems in managing these operations. It is an intricate system as there are lots of complications in ensuring support to the large number of students. While many things go to its advantage, there are some things, which work as disadvantages. For example, there are a lot of cases of students dropping out midway during their educational sojourn. Let us define what a dropout is: A dropout is “a person who leaves school, college or university before finishing a programme/course, or a person who lives in an unusual way”.

A report from U.K (1999) has found out that widely held beliefs given below contribute little towards dropouts. They shunned the beliefs that students drop out because of personal circumstances, initial expectations, quality of college facilities or to take up employment etc. On the other hand they found that good curriculum design, teaching methods and teacher-student and student-student relationships will have greater impact on dropout rather than the measures that improve facilities. Another trend showing study by Hargreaves (2001) found out that “With foreign students making up more than half the pool of US physics graduate students, it’s not surprising that educators are worried by the seemingly disproportionate numbers who switch, mid-PhD, into areas such as computer science and engineering.”

Garland (1993) as quoted in Sharma(2002), categorized various reasons given by students for withdrawing from distance learning courses into four groups:
Let us see some examples of these reasons.

Table 1: Why Students Drops?

<table>
<thead>
<tr>
<th>Sno</th>
<th>Typology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dispositional</td>
<td>Placed on inappropriate programs/courses</td>
</tr>
<tr>
<td>2</td>
<td>Dispositional</td>
<td>Find it difficult to identify peers</td>
</tr>
<tr>
<td>3</td>
<td>Dispositional</td>
<td>Find that course is not interesting/ beneficial</td>
</tr>
<tr>
<td>4</td>
<td>Dispositional</td>
<td>Have obtained fee waiver or reduction</td>
</tr>
<tr>
<td>5</td>
<td>Epistemological</td>
<td>Face difficulty at the start of course/program</td>
</tr>
<tr>
<td>6</td>
<td>Institutional</td>
<td>Applied to college late</td>
</tr>
<tr>
<td>7</td>
<td>Institutional</td>
<td>Find that the quality of teaching is not good</td>
</tr>
<tr>
<td>8</td>
<td>Situational</td>
<td>Feels that courses is not job oriented</td>
</tr>
<tr>
<td>9</td>
<td>Situational</td>
<td>Are Males</td>
</tr>
<tr>
<td>10</td>
<td>Situational</td>
<td>Have difficult family and financial circumstances</td>
</tr>
</tbody>
</table>


According to Garland (1993), situational and dispositional barriers proved to be the primary causes of attrition in distance education. However the U.K. report (Anonymous, 1999) deduces epistemological reasons as the main reasons and the Hargreaves (2001) work highlights the situational reasons.

We had one primary aim in this paper and that was of reducing dropouts. This paper applies Cognitive Dissonance Theory (Leon Festinger 1957) and tries to build a model with the help of ICT that can be employed in the Distance Education System to reduce the dropout rates. Festinger(1957) postulated the Cognitive Dissonance Theory and commented, “there is a tendency for individuals to seek consistency among their cognitions (i.e., beliefs, opinions). When there is an inconsistency between attitudes or behaviors (dissonance), something must change to eliminate the dissonance. In the case of a discrepancy between attitudes and behavior, it is most likely that the attitude will change to accommodate the behavior”.

Let us see in detail what is cognitive dissonance.

**Cognitive Dissonance**

According to Wikipedia, the free encyclopedia, cognition is used in different connotations. It could refer to the mental processes of an individual or an act of knowledge. Dissonance is disagreement or a conflict of people's opinions or actions or characters.

Kearsley(2005) stated that “according to cognitive dissonance theory (Festinger, 1957) there is a tendency for individuals to seek consistency among their cognitions (i.e., beliefs, opinions). When there is an inconsistency between attitudes or behaviors (dissonance), something must change to eliminate the dissonance. In the case of a discrepancy between attitudes and behavior, it is most likely that the attitude will change to accommodate the behavior.

Two factors affect the strength of the dissonance: the number of dissonant beliefs, and the importance attached to each belief. There are three ways to eliminate dissonance:
i. *Reduce the importance* of the dissonant beliefs,
ii. *Add more consonant beliefs* that outweigh the dissonant beliefs, or
iii. *Change the dissonant beliefs* so that they are no longer inconsistent.

Dissonance occurs most often in situations where an individual must choose between two incompatible beliefs or actions. The greatest dissonance is created when the two alternatives are equally attractive. Furthermore, attitude change is more likely in the direction of less incentive since this results in lower dissonance. In this respect, dissonance theory is contradictory to most behavioral theories, which would predict greater attitude change with increased incentive (i.e., reinforcement)

Matz & Wood (2005) demonstrated effect of group-induced dissonance. They found that the dissonance is attributed to lack of choice and opportunity to self-affirm. They asserted that this dissonance could be reduced through a variety of interpersonal strategies to achieve consensus.

### Some Examples to Eliminate Dissonance

There are many examples of explaining the aforesaid ways to eliminate dissonance. We will quote three such examples in order to explain what this theory is all about. We will then try to emulate a distance learner with this, in order to highlight the usefulness of this theory to the cause of dropouts.

<table>
<thead>
<tr>
<th>Sno</th>
<th>Reference</th>
<th>Problem Description</th>
<th>Dissonance</th>
<th>Reduce*</th>
<th>Add*</th>
<th>Change*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wikipedia</td>
<td>Purchasing a brand of washing machine thinking that it is the best brand</td>
<td>There is a better washing machine out in the market (as seen in an advertisement)</td>
<td>A person would purposely avoid other washing machine advertisements knowing that the decision had been made</td>
<td>Finding out about other products could lead to some discomfort.</td>
<td>One may deride the new improved washing machine, and perceive the new advertisement as untrue.</td>
</tr>
<tr>
<td>2</td>
<td>Kearsley Greg</td>
<td>Someone buys an expensive car</td>
<td>Discovers that it is not comfortable on long drives</td>
<td>It does not matter since the car is mainly used for short trips</td>
<td>Focusing on the cars strengths such as safety, appearance, handling</td>
<td>Getting rid of the car</td>
</tr>
<tr>
<td>3</td>
<td>Barker Phil</td>
<td>I am 100% sure the Earth is round!</td>
<td>When an alternative view is presented</td>
<td>I'll never venture beyond the town where I live, so it does not matter if the Earth is flat or round.</td>
<td>The Earth casts a round shadow on the moon, so it is possible the Earth is round.</td>
<td>Magellan circumnavigated the Earth, so it cannot be flat.</td>
</tr>
</tbody>
</table>

Now let us take the case of a distance learner who has taken admission in a particular program. There could be many dissonances but for instance, take a particular dissonance such as program not worthy of wasting time upon. In order to reduce the importance of this dissonant belief, one can say that it does not matter since you are not using this time in other fruitful activities either. To add more consonant belief that outweigh the dissonant belief one can say that education does not go waste and there is no harm in completing the program. To change the dissonant belief and remove inconsistency one can prove the utility of the program or show the job profile of his seniors.
Usefulness of Consonance

According to Smith (1999), Cognitive dissonance can motivate and challenge learners to think critically about their beliefs and cognitions, thereby enabling learning. It has implications for instructional designers. The distance learner in particular has much cognition as he is separated from his peers. When a dissonance comes in between he must be given some incentive/weightage so that he achieves consonance.

Stone Jeff & Cooper Joel (2001) commented. “ By focusing on the cognitive processes by which people interpret their behavior, detect the presence of a discrepancy, experience and label their arousal, and seek a strategy for its reduction, we believe that dissonance theory can move forward in new directions that continue to present important insights into human social behavior”. There have been many applications of cognitive dissonance theory in the field of Education, Management and Social Sciences.

Cognitive Dissonance is associated with the negative influence. It is therefore one to focus on getting rid of the discomfort situation. Dropping out is one of the easiest ways to end the discomfort situation. Achieving consonance can make the student escape from dropping out. According to Harmon-Jones (2004) dissonance results when one “freely chooses” to engage in behavior that is inconsistent with an attitude or belief. One must try to change attitudes and behavior of those students that are “possible dropouts”. Khare, Saxena & Garg (2004) has discussed a model for identifying such students who can be deemed as “possible dropouts”.

Let us see some examples of motivational remedies for “future or would be” dropouts. We have already listed the reasons attributed for dropping out e.g., placed on inappropriate programs/courses, find it difficult to identify peers, find that course is not interesting/ beneficial, have obtained fee waiver or reduction, face difficulty at the start of course/program, applied to college late, find that the quality of teaching is not good, feels that the course is not job-oriented, have difficulty in family and financial circumstances.

Let us the first reason, “placed on inappropriate programs/courses”. The motivational ways for reducing this dissonance is to enable this student to purposely avoid information about other programs and courses knowing that the decision had been made. He should think it in this way that it does not matter since education never goes waste etc. To add a consonant belief we can apprise him on the strengths of the program he is pursuing. To change his dissonant belief, we may give counter reasons that deride his dissonance and bring consonance e.g., this degree is recognized for all the public sector jobs while the “better program” that has created dissonance in him is acceptable in the private sector only.

Conclusion

We have tried to build a framework as to how “ Cognitive Dissonance theory” can help in bringing a change in attitude and behavior in a student that is hell-bent on dropping out. There are many ways to do this. We have to build a repository of positive thoughts in the form of frequently asked questions (FAQs) and put them on the university website. The link should be propagated to all those “would be” dropouts. There are already some initiatives towards this. For example IGNOU’s website contains a link [http://www.ignou.ac.in/stridehandbook2/section7.pdf](http://www.ignou.ac.in/stridehandbook2/section7.pdf) which tells the students about Studying: what when and how or section 5 which tells about time management: how can I find time? So the importance should be given to develop such resources which act as dissonance crunchers.

We would end with a piece of advice for the “would be” dropouts by quoting McKay & Fanning (1990), “ I seek knowledge in order to make wiser choices. My daily job is to broaden my knowledge. I can do whatever I want, but what I want is determined by what I know”. 
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EFFECTS OF GLOBALISATION ON EDUCATION AND CULTURE

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Abstract

Education is undergoing constant changes under the effects of globalisation. The effects of globalisation on education bring rapid developments in technology and communications are foreseeing changes within learning systems across the world as ideas, values and knowledge, changing the roles of students and teachers, and producing a shift in society from industrialisation towards an information-based society. It reflects the effect on culture and brings about a new form of cultural imperialism. The rise of new cultural imperialism is shaping children, the future citizens of the world into ‘global citizens’, intelligent people with a broad range of skills and knowledge to apply to a competitive, information based society. Globalisation and technological advancements are delivering and increasing access to the world and subsequently subjects should reflect this global outlook.

The internationalisation of higher education can be linked to various internal and external changes in the international system. Externally, there have been changes in the labour market, which have resulted in calls for more knowledge and skilled workers, and workers with deeper understandings of languages, cultures and business methods all over the world. Education is becoming more invaluable to individuals. In today's environment, education provides individuals with a better chance of employment, which in turn leads to a better lifestyle, power and status. The commodification of knowledge as intellectual property has occurred particularly with regard to connecting the intellectual work of universities with community, business, and government interests and priorities. While such a tendency is often welcomed by so-called applied disciplines, it causes tensions between the more profitable applied subjects of science and technology, and those of basic theoretical enquiry, particularly in arts and humanities. It also creates institutional winners and losers. This paper analyse the effect of globalisation on education and also discusses about the impact of globalisation on higher education, regulations, culture, allocation of operation funds etc.

Introduction

Globalisation is a process, which has affected many areas of human life, one of those being education. In the twentieth century, many developing countries have experienced growth in the educational facilities available to them due to the entry of institutions from the West. Some believe that this process is an invaluable opportunity for the people of the developing countries to raise their skills and standards of education. Others fear that it is merely a modern version of cultural imperialism that will lead to the creation of a universal, ultimately Western society. One aspect of the globalisation of education has been the creation of ‘twinning projects’ between one Western and one non-Western university (www.ssn.flinders.edu.au). Through Globalisation of education, which is being knowledge transfer from the Western countries into developing countries, is intended to improve the skills and capabilities of the people receiving it.

Bull and Watson wrote in their book ‘The Expansion of International Society’ that the European elites who entered India were accused of Western imperialism actually rediscovered India’s languages and religions and identified the region’s social, legal and political traditions and they also argued that the transplantation of Western institutions into developing countries shapes the behavior of those involved and thus makes for greater similarity with the people in which the institutions first evolved. In fact a study has shown that the process of transferring such institutions results in an increasing similarity of outlooks and values. David Orr (1999) argued that Western education has in fact
replaced "indigenous forms of education throughout the world and focuses on preparing students exclusively for an urban existence." He also claimed that through this process, people are losing their vernacular knowledge, by which he meant ‘the knowledge that people have of their places’, that is a loss of their cultural worth and he also believed that "our graduates of tomorrow will be trained, above all, to keep the wheels of the global economy turning". But the Western style of education is inadequate as it focuses largely on the creation of money whilst paying no attention to the preserving of cultures.

Joel S. Levine (www.cssjournal.com) argued that the “Educational institutions are pursuing viable mechanisms and structures for recognizing and accommodating individuals from diverse cultures. He believed that these initiatives usually enhance existing cultures but at the same time realises that we must not lose sight of the "pecking order" since the "adopter" culture must survive at all costs. Steven Schwartz (http://www.ssn.flinders.edu.au) believed that “Education, where possible, should be integrated into the private sector because ‘higher education is increasingly an international enterprise’ and thus will increasingly be pressured and drawn into deregulation and privatization”.

This paper analyse the effect of Globalisation on education and also discusses about the impact of globalisation on higher education, regulations, culture, allocation of operation funds etc.

**Impact of Globalisation in Higher Education**

Education is undergoing constant changes under the effects of globalisation. The effects of Globalisation on education bring rapid developments in technology and communications are foreseeing changes within school systems across the world as ideas, values and knowledge, changing the roles of students and teachers, and producing a shift in society from industrialisation towards an information-based society. It reflects the effect on culture and brings about a new form of cultural imperialism. It brings rapid developments in technology and communications are foreseeing changes within school systems across the world as ideas, values and knowledge. The rise of a global society, driven by technology and communication developments are shaping children, the future citizens of the world into ‘global citizens’, intelligent people with a broad range of skills and knowledge to apply to a competitive, information based society. The future of countries often lies within their ability to compete in a global market where industrial based economies are giving way to knowledge based industries, realising the importance of "knowledge, skills and the intellectual capacity to meet the challenges of accelerated change and uncertainty". Education is becoming a lifelong learning and training process, developing transferable skills and knowledge that can be applied to competitive markets where knowledge and information is being traded as a commodity.

The introduction of technology into the classroom is changing the nature of delivering education to students is gradually giving way to a new form of electronic literacy, more programs and education materials are made available in electronic form, teachers are preparing materials in electronic form; and students are generating papers, assignments and projects in electronic form. Video projection screens, books with storage device servers and CD ROMs as well as the emergence of on-line digital libraries are now replacing blackboards. Even exams and grades are gradually becoming available through electronic means and notebooks are starting to give way to laptops. Also, students can be examined through computer managed learning systems and do tutorial exercises on a computer rather than in a classroom. Such developments in education portray that there has been a shift from industrialisation to information-based societies. Subsequently, technology is foreseeing a change in the education environment towards a reliance on electronic sources to deliver material. With such changes and the emergence of video conferencing and the Internet, the barriers of distance are being broken down at a rapid rate, due to the key aspect of globalisation. Children and adults can now learn in a variety of ways and no longer have to be physically present in an education institution in order to learn, a definite advantage of flexible delivery systems. It allows for exploration of new areas of learning and thinking. The rapid growth of television services, with their immense influence as media of mass communication, has been very relevant in the technological shift. Other large contributions to
this shift include the transistor and space satellites. Communication and information based technology over the years is the Internet, which is a massive network of computers located throughout the world.

These computers maintain libraries of text, images, computer software, and other forms of data that can be accessed by anyone, anywhere, at any time. This implementation of technology and communication to be successful and to educate a society, both the students and teachers need to be technologically literate. Communication technology is offering new challenges for students of all abilities as they can discuss issues of concern with their fellow students from around the world, thus developing communication and interpersonal skills, fostering a mutual understanding across countries and cultures. Developments in the delivery of education is allowing for individuals to explore new areas of learning and thinking that could not be done with pen and paper. They are discovering knowledge through inquiry and experimentation rather than memorizing facts in a teacher dominated classroom setting. In fact, students no longer need to be physically present to learn as education material is becoming readily available over the Internet, through video conferencing, and tape recordings. Institutions are now turning towards the use of the Internet to deliver courses to students. A shift in education is becoming evident where more responsibility is being placed on the individual for his or her learning, instead of solely on the teacher. Subsequently, the teachers themselves also need to be highly technologically literate, needing the competence and confidence to prepare students for a global information society.

A global education should teach about issues that cross national boundaries, and interconnected systems on ecological, cultural, economical, political and technological grounds such as the Globalisation program which draws upon expertise in many areas such as humanities, social science and environmental science. Globalisation and technological advancements are delivering and increasing access to the world and subsequently subjects should reflect this global outlook.

Just because of technology and communication seems to be creating in human life between the ‘haves’ and the ‘have nots’, resulting in a bifurcated society of those who can afford such information technology and those who can’t, so too does globalization (www.ssn.flinders.edu.au). While education institutions in western societies are embracing technology, developing countries are once again left behind, too weak and fragile to implement development programs for education, let alone introduce technology as well. While third world states encourage their citizens to seek more education, severe limitations in delivering basic services are a problem. A lack of infrastructure and funding makes it difficult to implement any technological and communication advancements. However, despite differences in economy, political, culture and society, second and third worlds have adopted educational ideals from western thought and are anxious to appear modern and therefore promote education as a symbol of modernity and development to their own population and the foreign countries.

The spread of education internationally, as a result of globalisation, has clearly had effects on cultures worldwide. The capitalist society is gradually becoming global with a strong emphasis on free trade emerging. Educational institutions have reacted accordingly, by becoming more market oriented, focusing their energy more on creating funds rather than providing sufficient education for students. Due to this increasing free trade around the globe – to end protection in many sectors so that there is more competition and privatisation, education is increasingly being drawn into this global capitalist competition. The Internationalisation of education has become one of the key themes of educational policy and planning in the 1990s and the integration of worldwide capital and labour markets; educators are being forced to respond to a new set of challenges. The internationalisation of education, particularly higher education, is a growing phenomenon. Universities and colleges around the world are increasingly becoming forced to compete in the global capitalist market and engage in entrepreneurial activity to sustain themselves in an increasingly ‘uncertain world’.

The internationalisation of higher education can be linked to various internal and external changes in the international system. Externally, there have been changes in the labour market, which have
resulted in calls for more knowledge and skilled workers, and workers with deeper understandings of languages, cultures and business methods from all over the world. “Modern education…is almost exclusively focused on preparing children for an urban future,

The role of education has become more linked to globally competitive positions. Subsequent changes in university functions have lead universities toward “direct entrepreneurial activity to sustain themselves.” This in turn produces a change in institutional approaches to the development of overseas education. University courses must now be cross-cultural in content, which is in association with the growing number of students, particularly in the 1990's, searching for higher education outside of their own country.

Education is becoming more invaluable to individuals. In today's environment, education provides individuals with a better chance of employment, which in turn leads to a better lifestyle, power and status.

Under the prevailing global forces, higher education institutions everywhere are subject to global trends. Universities now facing more challenges than ever before, the rise of a globalised knowledge-based economy has brought universities in many countries under closer scrutiny for the economic contributions they make. Governments have been particularly concerned that universities serve national interests in the global marketplace. There is an international tendency to emphasize the practical, technical value of higher education. The commodification of knowledge as intellectual property has occurred particularly with regard to connecting the intellectual work of universities with community, business, and government interests and priorities. While such a tendency is often welcomed by so-called applied disciplines, it causes tensions between the more profitable applied subjects of science and technology, and those of basic theoretical enquiry, particularly arts and humanities subjects. It also creates institutional winners and losers.

Under the impact of globalising market forces, there has been a general trend towards the reduction of per capita public funding to higher education, at a time when the system is still expanding at both the initial and the ‘life-long learning’ levels. The burden of funding higher education is being shifted more and more to the shoulders of the individual on a ‘users-pay’ basis. Even public universities are increasingly funded by non-governmental sources, especially via student tuition and other fees, donations raised from alumni and others, and direct payment from business for services provided by the universities.

The linkage of performance to allocation of operation funds leads to intense competition among universities. Associated with that is the move to privatisation of higher education. Tensions between academic and commercial based subject are increasing. Substantial decline in levels of public funding, the current globalisation of higher education is mainly motivated by profits. Its goal is to meet market demand and to create a market for a variety of educational products. With substantial growth in the international student market, the issue of regulation of providers arises. It is extremely difficult to regulate the trade in academic institutions, programs, degrees or products across international borders. Lack of regulation is a major issue with the globalisation of higher education.

The current globalisation of higher education creates both challenges and opportunities. The relationship between universities education and globalisation gives special attention. Education will be the answer to many problems raised by globalisation. Educational goals are seen to be an area of great concern in the era of globalisation. It is here that universities play a crucially important role, for create better society. It is impossible to ignore the global; universities need to reflect on the impact of globalisation. They must engage with the issues of globalisation, both theoretically as analysts and researchers, and practically as academic workers involved in an increasingly globalised enterprise.

Universities providing a high quality education for the globalised world, despite its focus on internationalism and cross-cultural communication, are still based on an individualistic model of
teaching. Education should not become a means of westernising the world. On the contrary, it should treat each unique culture and society with due respect, realising that global education is not only learning about the West, but also studying different cultures of the world, using different approaches, ways of teaching and different media.

Another major problem with the global education system is accessibility. Many people in the developing world are still illiterate. According to a statistical analysis by UNESCO, literacy rates (percentage of people aged 15 and above who can read and write in their native language) in countries of Southern Asia in 1995 were as follows (www.uis.unesco.org):

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Both sexes</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>1995</td>
<td>32</td>
<td>47</td>
<td>15</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>1995</td>
<td>38</td>
<td>49</td>
<td>26</td>
</tr>
<tr>
<td>Bhutan</td>
<td>1995</td>
<td>42</td>
<td>56</td>
<td>28</td>
</tr>
<tr>
<td>India</td>
<td>1995</td>
<td>52</td>
<td>66</td>
<td>38</td>
</tr>
<tr>
<td>Maldives</td>
<td>1995</td>
<td>93</td>
<td>93</td>
<td>93</td>
</tr>
<tr>
<td>Nepal</td>
<td>1995</td>
<td>28</td>
<td>41</td>
<td>14</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1995</td>
<td>38</td>
<td>50</td>
<td>24</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>1995</td>
<td>90</td>
<td>93</td>
<td>87</td>
</tr>
</tbody>
</table>

The table above, in five of the eight countries less than 50% of the population is literate and in six of them only less than 40% of women can read and writes. In the countries of sub-Saharan Africa the figures are even more disturbing, with only 14% of the population (21% male, 7% female) of Nigeria being literate, followed by 19% of the population (29% male, 9% female) of Burkina Faso (in 1995). It is very surprise that today’s global schooling system, supported by numerous international institutions (UNESCO being one of them), which has already achieved so much in the internationalisation of pre-University and University education, is suffering a global crisis in the area of primary education.

**Conclusion**

Globalisation has had many obvious effects on educational technology and communication systems change the way education is delivered as well as roles played by both teachers and students. The development of this technology is facilitating the transition from an industrial based society to an information-based one. At the same time, there is a dark side to globalisation and to the very openness of the new information systems. While the richest countries grow richer, the poor are becoming poorer. Income, information and education gaps between the rich and the poor are widening not narrowing; economic crises, trade imbalances and structural adjustments have precipitated a moral crisis in many countries, tearing the basic social and cultural fabric of many families and communities apart, resulting in increasing youth unemployment, suicide, violence, racism and drug abuse and anti social behavior form schools. In the 21st century, education systems face the dual challenge of equipping students with the new knowledge, skills and values needed to be competitive in a global market while at the same time producing graduates who are responsible adults, good citizens both of their country and of the world. Thus globalisation challenges us to rethink not only how much education is needed but also its ultimate purposes.

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The Effects of Globalisation on Education By: Kate Francis, Kate Fitzgerald, Rebecca Lacey, Kate Hancock, David Ockendon

UNESCO statistics:

UNESCO statistics:
LEARNING BEYOND BOUNDARY: THE QUEST OF A GLOBAL RESEARCHER

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Abstract

Exploding information super highway is invigorating distance education internationally. Particularly, the advances in multimedia technologies are ameliorating the ambience of the classroom mode and also enhancing interactive surroundings for the global community. In the middle of this progress, the additional career demands of specific student sections springing up should be gratified. Although the scope of the education and the access to various institutions is improving, the options and opportunities to facilitate research studies are still very limited, particularly in the areas of science, engineering, medicine, etc. Added flexibility of courses, evolving a combinatory culture across various participating universities and increased infrastructure are crucial to boost the gamut. This will open possibilities to encourage the enthusiastic students to accomplish their dreams, irrespective of their age, gender or any unavoidable circumstances.

The author’s invaluable association with the Stanford Center for Professional Development (SCPD) as a student and the experience gained thereby has been helpful to identify certain issues. This paper highlights the motivation for advanced distance education programs in order to overcome the challenges faced by certain research students, particularly women. In essence, it hopes for an elevated global learning environment rendered to quench the quest of a global research student.

Introduction

Background

Latest innovations in technology, along with the changing socio-economic-cultural scenario are propelling the panorama of distance education (DE) to new vistas all around the globe (Harshananda, 1998). Particularly, the advances in multimedia technologies are ameliorating the emulation of a classroom ambience (Verma, 2005). These are enhancing the interactive surroundings for the seekers. In the middle of this progress, the additional career demands of specific student communities pursuing research careers should also be gratified. To better their prospects, a careful review of the various influencing factors is articulated in the following sections.

Learning in Modern times

In the modern times to pursue distance education in a supranational manner may be motivated by two prime reasons which are as follows:

Expansion of the world

Rapid changes are happening worldwide on various fronts including living style, economic growth, cultural mutations, technological advances etc.

Convergence of Technologies

Various technologies are being integrated dawning a new era of science and technology. As an example, textiles engineering is being combined with computer engineering and health sciences to the enchanting field of “wearable computing” (Ross, 2005). The shift of paradigm and merger is posing additional demands on the skill set that is required by the professionals to cater to the
fields. From established traditional education systems it is welcoming the generations to a “renaissance of the present education system”, particularly the thrust is on distance education.

**Renaissance Professionals**

The present avatar of the renaissance professional (Mahadevan, 2005) should be; bold and broad minded, open to intercontinental travel (Albuquerque, 2001) if necessary even to space, with good interaction and communication skills to multicultural, multi-lingual co-workers, flexible to jobs and requirements, embracing more of a goal oriented objective approach to tasks in a spiritual manner without a compromise to his/her roots and culture. To avoid the cultural chaos through this metamorphosis, keeping up the basic values and integrity is very crucial. This is to protect the local interests of the self, family, country and beyond. Distance Education (DE) in this process has a significant place for the professional to carry on the learning process while caring for their immediate requirements with a perfect work-life balance.

**Social –Economic Growth**

Changing social circumstances, increasing economy are promoting the natural curiosity to learn the subjects that improve the quality of the citizen’s economic, social and spiritual lives, living standards and offer protection from exploitation to participate in social change in a confident mode. DE has the power to facilitate this luxurious learning.

**Barriers to Progress**

Not only progress but also, the constraints that lie to forge ahead with the tide catalyze learning (Shankaracharya, 1996).

Following are some of the aspects that have not seen much change with time. These cause hesitation to readily participate in schools.

- Personality problems in adults
- Social issues and crisis situations
- Rural reluctance and language barriers

In essence, like in any other field both hurdles as well as progress can nurture the urge to search for more faculties to evolve.

**Women and Distance Education**

**Researching Women**

Research needs to be understood by many particularly in developing countries as an aptitude and it need not necessarily remain as a means to earn. Women particularly in India from times immemorial had been intellectual seekers (Harshananda, 1998). We see several references to this in our scriptures. Invasions to the countries temporarily halted this learning process, defined them with certain traditional roles and confined them to family for security reasons. Times have changed and women yet again are into society as workingwomen trying to liberate themselves particularly against any forced suppression they faced. Currently they are also elevating themselves beyond working just for financial needs to a level of mental plane.

The proximity of DE to a woman at higher levels of research cannot be undermined while they indirectly hold the staff of a flourishing family and society. Hence it is important that some of the intellectually oriented woman pursue their inquisitive studies to keep all happy around them.

**Sensitive and Responsible Seeking Spirit**
The role of women is well defined in most of the countries by their social surroundings and is less likely to change in a deeper sense. Also naturally a woman wishes to grow causing less conflict to these fundamental responsibilities and moulds her self and her interests after satisfying the needs of the family provided there is faith, psychological, moral support from the prime family members. This is an inbuilt feature into her dynamics. Women students perform well with financial self-sufficiency provided there is encouragement.

**Realistic Scenario: Amending Attitudes**

To foster the spirit of a woman to her choicest interests is increasingly needed with a broad understanding of the realistic scenario (http://scpd.stanford.edu).

- The role of a woman is significant always as a daughter, wife, mother trying to better her surroundings and society
- Lack of jobs due to unemployment, layoffs etc. are forcing woman to work for survival
- They share the responsibility to meet with the required living standards
- Sudden calamities keep her ready to face life with more strength, than to prepare her while the difficulty pounces (Kanwar and Taplin, 2001).

DE no doubt can offer a solution without compromising too much on her family also without deviating herself too much from her traditional roles.

**Present Status**

DE definitely is a solution in all the above cases. But state-of-art perception that it is a cost effective, pliable by location, flexible by timing of completion is true only at the basic education levels of certificate, diploma and degree level courses.

With a closer look, we clearly notice that DE is lagging at higher education levels. The academic curriculum and education standards are not on par with the rate of change at which the world is booming.

**Advanced Studies**

Along with the rise in the living standards the intellectual yearning of the individuals towards higher education is getting prominent.

Increasing number of people are aspiring doctoral level studies worldwide.

**Means of Global Research and Learning: Limitations and Improvements**

**Courses and Curriculum**

Universities have limited DE Programs at an advanced study level.

**Deficiency of engineering, science as well as medicine courses is very obvious at the research level.** Selected number of these courses in certain disciplines is available only up to Master’s level at some of the prestigious institutions too.

While a research degree is time-consuming, the students can obtain the most effective results in this, while they are in the proximity to their emotional/personal interests. This is more pronounced for women as described in the earlier sections.
Inter Disciplinary Subjects

The curriculum offered by a university usually prescribes to a confined set of subjects. The scope for research, if the student is interested in multiple subjects is restricted. The student is not left with much option but to pursue what is available. This is particularly true when it is a multidisciplinary area.

People on Career Change or Break

Presently DE is available more to people in work as a professional improvement program. What about the people who are not in-service?

Laid Off From Jobs

Changing economic scenario is forcing many people out of jobs. This unexpected break time perhaps is the best time for them to constructively focus and improve their skills without feeling the loss of time imposed by the uncontrollable situations.

On Recovery Ramp

While the people are on change of jobs or on a recovery ramp from unmanageable situations, DE offered at affordable fees will be a major confidence booster particularly to nurture them back to strength.

Professional Change

It can even be as an intellectual hobby for a man/woman who is towards professional change into academics from any other profession. It can be useful for a woman who could be a prosperous mother, who will educate many children and family.

Children, who have creative and intellectual mothers, fare better in life compared to idle mothers as long as there is care for the family.

Mix and match of courses

To mix and match courses from different disciplines and universities is prime necessity in research studies based on the thesis that is required for the specific work. This need is more pronounced while technologies are converging and renaissance modes are setting in universally.

Recognition of Previous Learning

Recognition of courses completed at other prestigious institutions is required at the advanced level. At the same time, opening up of the universities to become versatile is the need of the hour.

Standardization

While the symptoms hint at this point pervasion of global universities, the necessity to standardize the fees, course structure, language requirements, efficiency of faculty etc, across the various institutions remains in limelight for the betterment of all. The provisions of the universities have to be flexed as required.
Access to the Means

Investment and planning based on the suggestions mentioned above in DE at the research level are imperative and important. The government as well as the education funding agencies should accordingly support this.

Minimal residential requirements to complete courses can be organized if necessary. In this technological age it may be possible to carry on a lot of activities through video conferencing and remote participation.

Faculty should be trained sufficiently well to manage the programs. They should be in a position not to discourage the students with stringent logistics but to encourage the research bent of mind in the student, advising them to choose the correct topics that can fit in a DE mode.

Summary

This paper focuses on the need to improve distance education at the level of advanced research studies. Added flexibility of courses, evolving a combinatory culture across various participating universities and increased infrastructure at affordable fees are crucial to boost the gamut of DE.
This will open possibilities to encourage the enthusiastic students to accomplish their dreams, irrespective of their age, gender or any uncontrollable circumstances.

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References


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COMPUTER TECHNOLOGY FOR LITERACY AND EMPOWERMENT OF MASSES IN DEVELOPING COUNTRIES

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Abstract

Presuming that the economic development of a country depends on i) the level of success in expanding educational opportunities for masses, and ii) to what extent common people feel empowered for making decisions in various spheres of their lives, the authors maintain that the computer technology has opened avenues in the field of education that were absent as late as the last decade. In developing countries that are characterized by resource shortages, education funding generally gets shortchanged compared to other more pressing needs. This presentation will focus on the creative use of computer technology for expanding educational opportunities for the masses at the fraction of cost compared to the traditional modes of schooling. We believe that there is a realistic case to be made for a shift in paradigm about the process of education that is more relevant for the 21st century. The presentation would include instances of successes of pioneering efforts in the field of education from several countries, including India, and engage the audience in generating ideas that are feasible and promising.

Introduction

Education and national development go hand in hand. The rise in education level of the masses both in quantity and quality is a fundamental step in ensuring a large scale economic development of a state, or a nation. For this reason, the United Nations, from its inception, considered basic literacy for all as a major world wide initiative and a priority. All nations of the world have committed themselves to this goal at one or other time. As a result, large scale efforts have been made in each country to achieve a universal level of literacy for all their citizens. But the results are far from being achieved. It is estimated that at least seventy countries would not achieve their goal of basic literacy for all by the target year 2015. Some of the countries that would fully achieve the goal of total literacy include Russia and former USSR countries, Singapore, South Korea, Cuba, China, Nicaragua, and Ethiopia. Most countries in Africa, Middle East, and South-East Asia continue to have the highest illiteracy rates despite large investments of funds. UNESCO estimates that there are nearly one billion people in the world who are yet to achieve basic literacy levels. Wide disparities exist especially in developing countries when it comes to the educational opportunities offered to males vs. females, with the latter receiving considerably less attention. (EFA, 2005)

Economic Reality

“Mind is a terrible thing to waste”, is a popular saying. But providing education for all is costly. Many developing countries that characteristically have few economic resources find themselves with pressing needs in all spheres. In such an environment, it is no surprise that financial commitments to education lag behind many other needs such as providing food, shelter, and security. Even in the United States of America, with the largest economy in the world, education dollars are not sufficient to meet all the needs that exist in schools, and colleges/universities.

Shortage of Schools, Shortage of Teachers

The existing model, practice for centuries, requires a (trained) teacher, a school building to protect participants from the elements, and supply of appropriate instructional materials. It also assumes that students would travel to a central school location at a given period during the day where they would
receive organized instruction. The assumption is made that in order to be educated, one has to be enrolled and physically attend a school on a regular basis. Each one of these requirements adds cost and restraints on the schooling system. Putting all the factors together makes the educational enterprise one of the costliest initiatives in many countries, second perhaps only to the security related expenditures. Conversely, when demands on resources increase due to shifting priorities in a country, education funding becomes an easy target for accessing additional funds. There really are never sufficient funds for education even in a country with booming economy e.g. India or one with less stellar economic picture as in Bangladesh, Pakistan, Jordan, and Egypt. (UNESCO 2005)

Needed: A Paradigm Shift for Expanding Educational Opportunities

Haddad and Draxler (2002) proposed that given the shortage of resources, nations should start thinking of education not as ‘a location but an activity: a teaching/learning activity’. If we consider this as a postulate, education can be provided not just in a school building during limited hours but anywhere and anytime where people are. Many institutions subscribing to this paradigm have developed a huge market for their programs as evidenced by a huge market for on-line degree granting courses in the past five years. However, most such programs are at the higher education level for those who have already attained secondary education from traditional schools. Friedman (2005) in his latest book, The World Is Flat: A Brief History of the Twenty First Century, describes the technological advancement for doing work via cyberspace within a country or across the world, a fundamental shift in capacity that would revolutionize the economies of countries that were hitherto unable to do many things due to lack of resources. Nations that do not educate all its citizens and allow them to enter active workforce in the next ten or twenty years would be left behind further with each passing year in the next decade. In other words, nations that take advantage of the new capacities offered by computer technology would be the front runners claiming a major share of resources from the rest of the world. Friedman considers the changes taking place in the way world business is conducted today as fundamental to the future as the industrial revolution was in the last hundred years.

With the advent of powerful desktop computers at affordable prices, and the rapid development of internet, the question needs to be answered for why not use this medium (e.g. computers) for large scale basic literacy programs in places where formal schooling has not penetrated beyond the surface. In a short time, computer based literacy programs can be more economical and highly successful for educating the masses in developing countries if the governments and private agencies would shift their paradigm of how education is delivered. Farrel and Wachholz (2003) have contributed greatly to our knowledge of the status with regard to Distance Education and various models being attempted by governments and private agencies. The authors propose that the need for basic literacy is acute and any delay in achieving this goal universally should be considered as a huge loss and a waste of enormous human talent and abilities by governments and private organizations. Use of computers is the future and how well and fast a society begins to use them for most of their business would determine how successful its people would be in the coming decades. We ask a simple question: Why not should we figure out how to use the tremendous capacity of computers for educating the masses especially in areas where progress has been extremely slow through traditional methods?

Viable Computer Technology Models

Many small scale experiments in India and elsewhere initiated by governments, NGOs, and businesses provide exciting and promising models that can be adapted over wide geographical areas. In this section a brief description of several projects is provided. The intent for providing these examples is to show that creative uses of computers have already been implemented that have

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1 Notable exceptions are highly successful Distance Education programs such as India’s National Open Schooling program, UNED program in Spain for S. American and Central American countries, and programs in S. Africa.
overcome the most nagging problems of inadequate infra-structure in rural areas. Additional information can be obtained directly from the sources cited at the end.

**E-Choupal**

A leading private company (ITC) in India has implemented an innovative approach for empowering village farmers using computer technology and internet. Given that most farmers are in small villages that are not well connected through roads, ITC developed an ambitious plan to connect the villages (and farmers) by setting up a computer in a centrally located village (serving approximately 600 farmers in about a five kilometer radius). The company provides training to a person (called *sanchalak*) from the village in the basic use of computer and necessary software such as word processing, web browsing, email, and on-line ordering. The *sanchalak*, in turn, makes the computer available to local farmers each day for finding information using the internet on a variety of topics. Generally, these include looking at commodity rates in various markets, weather information, news, and best farming practices, and Question and Answer sessions. During harvest, ITC also provides opportunity for farmers to sell their crops at the company sanctioned locations, within a reasonable distance, at the previous days closing rates. A significant advantage of this strategy is that the farmers end with a much higher price for their crops by avoiding a middle person who used to take most of the profits by exploiting the limited resources of a common small farmer in India. In addition, farmers can order on-line their supplies e.g. seeds, and fertilizers, as well as many other products needed for farming. This way, they are assured a higher quality of products at reasonable prices – another drawback that farmer usually suffered from in the past. A small commission is provided by the company to *sanchalak* on each transaction from the computer. (Annamalai et. al. 2003)

The reason we mention this project is that here is a model that has overcome many of the infrastructure obstacles on large scale in Indian villages that have an endemic problem of electric shortages and poor telephone services. E-Choupals have been a viable method of connecting people from villages (most of them illiterate) to internet. ITC has also announced that the computer in off-peak hours can be used for education, and health related information services. Hardware and connectivity problems have been resolved by using Battery Packs, and Solar battery chargers, dial-up service or lately a VSAT connection for accessing the internet. The initial set up is expensive (appx. $6000). On a recurring basis, the cost is appx. $100 per month.

**The Tata Group**

The Tata Group is a large industrial group in India. To address the problem of illiteracy in rural areas, this group has set up 415 centers educating nearly 9000 people. The lessons, based on the National Literacy Mission materials, are delivered on a stand-alone computer using animated graphics and voiceover. The focus of each lesson is on developing functional literacy that can be developed in 40 hours, according to the project developers. Functional literacy is described as being able to read road signs, and simple instructions used in various tasks on a daily basis. As a result of the project, women who were unable to go to schools previously are now able to read and see the benefits of education for themselves and their children.

Our reason for highlighting this project is to demonstrate that literacy projects can be launched at specialized centers that are located within a few miles of villagers. Instructional materials can be loaded on the stand-alone computers that can be made available to villagers using flexible hours. The requirements for hardware are minimal beyond the initial setup.

Similar projects have also been set up in Malaysia using an “ICT hub” with up-to-date multimedia equipment. These hubs provide an integrated curriculum for students in the area going beyond what the schools can provide.

**Developing a Computer-Based Program for Literacy**
As mentioned earlier, a cost-effective program can be started that provides flexibility for learners and cut the recurring costs to minimum by using computers in innovative ways. In order to develop such a program, considerations of infra-structure for delivery of instruction, and on-going operation are necessary. The development of high quality instructional materials is another major consideration, although there is a great deal of experience and expertise at national and local levels for producing high quality educational materials.

Implementing a technology based solution in the developing countries; especially in the rural areas, depends on paying close attention to infra-structure necessary for a viable instructional program. In this section, we are exploring two types of scenarios, one with the infrastructure that can support internet access (internet based), and the other without such capability (standalone). The flowchart 1 includes these conditions and a schematic of various factors requiring discussion for developing innovative solutions unique for each country.

**Flow chart 1.0**

**Scenario One – Infra-structure Supporting Internet Connection**

A computer with internet connection can help the rural youth to connect to the available distance learning courses from different schools and colleges in far away places. Students who are not likely to attend a school due to geographical location or other reasons would be able to acquire not only literacy skills in this manner but can also advance to higher levels of educational ladder.
**Internet connection**

Access to internet would enhance and expand the curriculum by using a wide array of teaching and learning materials and situations. Internet connection can be set up as a dial up connection or through satellite connection – the latter being more expensive – but extremely efficient.

**Phone connection**

Phone connection is needed only in places with dial up internet connection.

**Reliable power supply**

Uninterrupted power supply is essential for successful operation of this nature. Since developing countries generally have power shortages on a recurrent basis, this becomes an important limiting factor that must be overcome. Some options available include: Battery packs and battery chargers. The assumption is that while the power is on, battery chargers can charge the battery packs for later use. In the E-Choupal project, solar energy chargers have been used with limited success. A one full day of sunlight with one battery pack is sufficient to run computer for 60 – 90 minutes in the evenings.

Computers are becoming cheaper each year and it is likely that many middle class families in the developing countries, such as India, can afford to buy their own computers and access the instructional materials for their own use. The cost for implementing solar powered solutions is a concern that needs to be addressed in each country with engineers and other experts.

**Scenario Two – Infra-structure Without Supporting Internet Connection (Standalone)**

Rural areas without adequate infra-structure to access to internet would use a standalone computer strategy. The users (or a center in a village) can be supplied computers that are already loaded with necessary educational modules or supplied with necessary CDs (and updates) for the use by individual users.

This scenario needs a source of reliable power supply & the educational modules (with permission to save the resources locally). Saving resources locally will help the students to access it without any internet connection. Since there is no need for internet access, phone connectivity is not required. Power sources in such places are more likely to be dependent on battery packs and solar energy to a large extent each day.

A crucial element for this scenario will be the availability of high quality instructional materials (modules) that are context specific and suited for the populations to be served.

Educational reach in the rural areas can be expanded using these technologies. Untrained youth in the rural areas can be trained to use computers for different purposes. A computer with a trainer can act as a teaching station to educate more rural children. Moreover rural youth can access these technologies for their education and business purposes. Recently, Cyber Cafés have become a reality in almost all corners of the world. In the absence of other centers, the cyber cafes can be used as an educational hub.

**Conclusion**

The success of an initiative depends largely on the commitment exhibited by those responsible for its implementation. Technical constraints, although large in scope, are surmountable if there is a priority established for using computers on wide scale in a given country. While we fully believe that formal schooling is necessary when and where it can be established, there is an unprecedented opportunity
available now to implement strategies that can potentially cover a much larger geographical area in efficient manner. There are still nearly one billion illiterate people in the world (majority of them in few countries) whose participation in national development is highly limited. The challenge is great and innovative strategies need to be adopted to reach such large number of people in the shortest possible time. The existing successful Open School movements are primarily based on print, and audio and video materials. But the coverage of these programs is still limited compared to the size of the population in need of services. Computer technology, once adopted as a strategy for educating the masses, has the potential to be a less expensive solution than all others while the shortage of schools and trained teachers continue to plague the educational services in many countries of the world.

References

Education for All The Quality Imperative (2005), EFA Global Monitoring Report, and Paris: UNESCO.

End-notes

1 For a detailed description of E-Choupal and its various aspects see http://echoupal.com

2 See www.tataliteracy.com/how_it_works.htm# for a full description of the project.

3 See www2.coca-cola.com/citizenship/education_malaysia_elearning.html for additional details.