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## Editorial – Standing by Ponds

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(Guest Editor).

You can't step in the same water twice, said Heraclitus. He may have been correct in the literal sense, but even Heraclitus must have had those déjà vu moments when his life seemed to be repeating itself. Standing by a pond while making a [video download](#) for this IRRODL editorial recalled identical experiences filming by ponds in 1975 and 1996, and prompted some thoughts on how little institutional policy ever really changes in the world of media-based education.

In the mid-90s, television was on its way out as a medium of choice in North American and European education. It had been struggling for credibility for almost as long as it had been in use. The Open University in the UK, for example, started broadcasting course materials on TV in the early '70s, in the middle of the night and often for surprisingly small student enrolments of a few dozen. In 1978 the cost-effectiveness of this effort was questioned at a London University conference with the provocative title "Is anybody there?" It turned out they weren't, at least not in justifiable numbers, and that many courses could have been delivered to the students more efficiently in the mail on audio-tapes.

Since the late '90s, the same question has been asked about the World-Wide Web, at least in regions where only tiny proportions of the population have Internet access. Turning a blind eye to the inaccessibility hurdle, developing-world institutions have pressed on developing web-based ODL materials anyway, with an eager "If we build it, they will come" attitude. They appear motivated to adopt the most modern techniques available, regardless, and are encouraged in this by western distance educators who apparently regard media older than the web as strange and obsolete. But "Is anyone there, or likely to be so?" Actually not for the foreseeable future.

Web-based education has polarised world society into elite and have-not groups far more than TV and radio ever did; and its adoption in the developing world appears oblivious to the fact that today's students would derive greater benefit from media that are actually available to them. Are the hundreds of millions of would-be students who cannot access the Internet a kind of 'untouchable' class, whose problems and needs have become invisible?

Fortunately, in India and other developing countries, the needs of disadvantaged students remain very much in focus, and offer inspiration for all educators. For example, the University estimated by that bastion of source credibility, Wikipedia ('mega-universities' entry), as having the 7th largest student enrolment in the world, is named after Dr. B.R. Ambedkar, who devoted his life to erasing untouchability from Indian society and to implementing open learning methods for the benefit of all. Today Dr. B.R. Ambedkar Open University maintains its commitment to these

ideals by preserving far-reaching uses of radio, TV, and audio/ videotape, while other Asian universities struggle and fail to harness more elitist forms of Internet-based education.

## The Current Edition

The power of traditional approaches at universities such as BRAOU does not go unrecognised. As the current edition of *IRRODL* indicates, a major change is taking place internationally in the selection of DE technologies, including non-Internet-based audio and video. The first of the edition's eight Main Section papers, a valuable contribution by Stephen Asunka, indicates the vital need for DE delivery systems to be continually and critically assessed. Asunka's article indicates the pressure felt by Sub-Saharan institutions to implement Internet-based delivery methods, in response to encouragement during the past decade by organisations including UNESCO and the World Bank. The paper points out that pilot-tests of Web-based learning in Ghana are meeting with negative student response, and that Sub-Saharan institutions need help in order to deal with the contextual and motivational questions responsible. The answer to these questions is partly evident in the simple fact that, as Asunka points out, Internet access in Sub-Saharan Africa, ten years on, is still limited to 3% of the population - as clear an explanation as one might ever need regarding the practical and motivational obstacles to online learning in the region.

Negative student experiences with online learning are commonplace not only in Africa but throughout Asia, if not uniformly so. In Japan, for example, Internet access is far less of a problem than in other Asian nations, and student responses to e-learning attempts are more positive. Many Japanese educators remain reluctant to adopt online methods, however, as indicated in the article by Bray, Aoki and Dlugosh. The relatively slow adoption rate of Internet-based education in Japan may change with the current emphasis on Internet-based methods in the development of the nation's new Open University.

Having recently returned to Canada from a four-year tour of DE initiatives in 21 Asia-Pacific countries, I deeply sympathise with these institutions in their attempts to harness e-learning – but I especially sympathise with their students. Back in the world where the Internet is actually accessible to most students, one can applaud the advances, both technological and theoretical, being made in the attempt to improve ODL methods. These are seen in the current edition's theoretical critiques by Sushita Gookol Ramdoo (*Beyond the Theoretical Impasse: Extending the applications of Transactional Distance Theory*), and by Rita Kop and Adrian Hill (*Connectivism: Learning theory of the future or vestige of the past?*).

Three papers in the Journal's current edition provide practical and applied perspectives. These include an analysis from Canada by Leslie and Murphy (*Post-secondary Students' Purposes for Blogging*); an article from Iceland by Edvardsson and Oskarsson (*Distance Education and Academic Achievement in Business Administration*); and a case study of distance examination scheduling and redistribution from Virginia in the US, by Abdous and Wu He. A second US paper follows, by Shachar, discussing the need for ODL knowledge-sharing based on meta-analytic approaches. The issue also reviews two recent books: *Expectations and Demands in Online Teaching* by Gudea and Ryan; *Video in Research in the Learning Sciences* by Goldman, Pea, Barron and Derry.

Finally, returning to the main theme of this editorial, the edition features two Technical Reports. In the Journal's previous edition, reports by Sally Berman and Scott Motlik examined the development of DE technologies in Asia. Both authors extend their reviews in the current edition,

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Motlik with an update on the evolution of Internet-based methods in China and South Korea, and Berman with an update on innovative DE technologies in Bhutan, India, and Sri Lanka. These authors are critical of current Internet-based approaches in these countries, and they encourage a simple and constructive alternative: i.e. continuing to use the highly accessible traditional educational media. As Motlik bluntly asks, if China and South Korea, “two of the most developed nations in Asia cannot efficiently implement online learning in more than a decade, what hope do less developed nations have of doing so?”

## Conclusions

Standing by the pond at Athabasca University in Alberta, home of this Journal, one can be grateful that times don't really change that much at all, and that there are still world-class educators who use media which really do reach the student population. Via imaginative fusions of radio, TV, and the web, we can learn from them how ODL delivery practices must be driven by accessibility rather than novelty.

I cannot end this Editorial, however, without returning to the opening paper by Asunka. It quotes a *cri de coeur* from a student, pleading with the instructor for an extension to an online project deadline. “This is because my project has been affected very much by the power fluctuation we are experiencing in both on campus and at home...This has not only caused low performance (but) I am facing some sort of a psychological battle at the moment, because I really did take the paper.” As Asunka stresses, many students are loath to make such pleas, and only do so “in their moments of desperation”

How long will we continue to ignore such bewilderment and frustration on the part of our students, while seeking to implement novel but patently inappropriate technologies purely for the sake of it? And how long will we ignore the obvious fact that it is the blind eye being turned to Internet inaccessibility by institutions and funding agencies that is failing the students, rather than an intrinsic lack of motivation and application on the students' part? Institutional and agency support for Internet-based methods is not just a matter of attempting to think ahead to a day when the new technologies will have become appropriate for all, but a culpable and dishonest disregard for the present, and for the students needs within it.



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## **Online Learning in Higher Education in Sub-Saharan Africa: Ghanaian University students' experiences and perceptions**

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### **Abstract**

This study adopted a qualitative case-study approach to examine the attitudes, experiences, and perceptions of undergraduate students who were enrolled in an online, collaborative learning course at a Ghanaian private university. Data sources included surveys, student and instructor journal entries, email records, individual interviews, and Web-server logs. The study found that the students did not respond favorably to online constructivist teaching approaches such as asynchronous discussions and ill-structured project-based learning activities, and perceived collaborative online learning within their context as a complex, more demanding and time-consuming experience.

**Keywords:** Higher Education; collaborative online learning; Sub-Saharan Africa; Ghana; students' perceptions; constructivist pedagogy

### **Introduction**

With the current advances in Information and Communication Technologies (ICTs) by way of improved computer power, faster data transfer rates, and attendant lowering of costs, coupled with the fact that the effective integration of these technologies into educational curricula has been demonstrated to have positive effects on student learning (Harvey, 2003; Kiluk, 1994; Salpeter, 1998), technology-enabled instruction, especially online learning, has emerged as the most feasible and economically sound means of expanding access to quality higher education. Online learning is thus being rapidly adopted by educational institutions worldwide as an alternate or complementary mode of education delivery, and indeed has been heralded as the next democratizing force in education, particularly in higher education (Jones, 1997). Thus, in the United States, for example, over 3.5 million college students took at least one online course in the fall term of 2006 (Allen & Seaman, 2007).

In Sub-Saharan Africa, however, where it is estimated that only 1 in 250 people have access to the Internet as against the global average of 1 in 15 (UNESCO Institute for Statistics, 2007) online learning in higher education poses a great challenge as this mode of instruction delivery relies solely on the available information and communication technology infrastructure. In addition, most institutions within the sub-region are currently in a state of crises – having to cope

with collapsing infrastructure, brain drain, and dwindling financial resources, whilst under increasing pressure to cater for larger student populations (Saint, 1999).

Despite these constraints, online learning is still being touted as the only and best possible solution to the problem of access to quality higher education in Sub-Saharan Africa, especially as it has been demonstrated within other settings (notably the developed world) that learners who have participated in online learning, mostly report that they perceive this mode of learning as being convenient and flexible (Leasure, Davis & Thievon, 2000), offering a greater access to learning resources (Sener & Stover, 2000), increasing student motivation and self-esteem (Kearsley, 1996), enhancing learner participation and interactivity (Fredericksen, Pickett, Shea, Pelz, & Swan, 2000; Maeroff, 2004), and more significantly, improving the quality of learning (Fjermestad, Hiltz, & Zhang, 2005).

Thus most institutions within Sub-Saharan Africa are beginning to explore the possibility of adopting this mode of learning to help address the ever-growing demand for tertiary education within the sub region (UNESCO, 2007). Unfortunately, this is mostly being done with little recourse to trying to understand the students' characteristics and their perceptions about the helpfulness, accessibility, and usability of these technologies within their context.

Indeed, studies have documented students' reported distress with online learning, attributable mostly to inappropriate implementation practices that led to such unpleasant experiences as communication breakdowns and technical difficulties (Hara & Kling, 2003), ambiguous instructions (Merisotis & Olsen, 2000), unwillingness of other learners to participate in group assignments (Dirkx & Smith, 2004; Maeroff, 2004), and the general feeling of 'disconnect' due to the lack of face-to-face interactions (Stodel, Thompson & MacDonald, 2006). These experiences are said to be major contributory factors to the high dropout rates in most online courses (Carr, 2000), low motivation of some students to learn (Maltby & Whittle, 2000), and low student satisfaction with their learning experiences (Kenny, 2003; Muilenburg & Berge, 2005).

The question then arises as to how higher education students who have limited access to technological resources, as pertains in Sub-Saharan Africa, perceive this mode of learning, particularly as they are more accustomed to the traditional lecture mode of instruction delivery, whilst the presence digital content that is aligned with curriculum frameworks is known to be limited in Africa (Farrell, Isaacs & Trucano, 2007).

Ghana is a country located in Sub-Saharan Africa, and so all the aforementioned issues of inadequate resources and institutional difficulties, are more applicable in Ghanaian higher education. As it is known that the total commitment and participation of learners is crucial for successful learning outcomes of collaborative online learning courses (Hiltz & Shea, 2005; Petrova & Sinclair, 2005), if Ghanaian educators hope to successfully implement collaborative online learning within higher education institutions, they must, in addition to considering the broader contextual and environmental factors that influence this mode of learning, make special efforts to get the support and acceptance from the students (Arbaugh & Benbunan-Fich, 2005; Khan, 2005). This starts with empirical studies aimed at understanding the perceptions such students hold about online learning environments within their context (Hara & Kling, 2003; Petrova & Sinclair, 2005; Shneiderman, 1992), and the various contextual factors that influence those perceptions.

It is in line with this argument that this study investigated Ghanaian university students' perceptions of collaborative online learning by eliciting their opinions, and also studying their

attitudes and experiences as they engage in collaborative online learning activities within the African context.

## Research Questions

Considering the fact that Internet usage in Ghana involves only 1.8 percent of the total population (Internet World Stats, 2007), whilst current university students are more accustomed to courses that are delivered as linear lectures and presentations, this study sought to examine the following broad questions:

1. What are Ghanaian university students' general expectations and perceptions of collaborative online learning environments?
2. How will "traditional" Ghanaian university students engage in a collaborative online learning course, and what are the major factors that will influence their performance in the course?

## *Theoretical Perspective and Research Model*

Collaborative learning, an implementation of social constructivist pedagogy, is a learner-centered instructional strategy that involves social processes by which groups of students work together as teams to complete academic problem-solving tasks designed to promote learning (Alavi, 1994; Benbunan-Fich, Hiltz & Harasim, 2005; Dennen, 2000). With institutions now integrating various computer and Internet technologies into instruction delivery, and the subsequent realization that the online environment can effectively support the social aspect of learning emphasized by collaborative learning, most collaborative learning initiatives, such as case-, project- or problem-based learning, are being implemented online. Relan and Gillani (1997) therefore define collaborative online learning as "the application of a repertoire of cognitively oriented instructional strategies, implemented within a constructivist and collaborative learning environment utilizing the attributes and resources of the World Wide Web" (p. 43).

For effective use of the Web as a learning platform, computer software known as Learning or Course Management Systems have been developed to provide a single platform for the integration of components and features for content delivery, communication, and evaluation. Several of these applications have been widely adopted by several higher education institutions as the main platform for collaborative online learning, with notable examples being *Blackboard*, *ClassWeb* and *Moodle* (Bennett, 2003; Dutton, Cheong, & Park, 2004a; Olsen, 2001). Collaborative online learning, therefore, involves harnessing the affordances of media and communication technologies to implement constructivist learning strategies in ways that will encourage students with diverse attributes and in different locations to work together and productively on academic tasks. In addition to constructivism therefore, media effects theories, such as social presence (Short, Williams & Christie, 1976) and media richness (Daft & Lengel, 1986) theories, together with group interaction/ social influence (Benbunan-Fich et al., 2005) theories, all contribute in explaining what happens and why in collaborative online learning environments (Hiltz, Coppola, Rotter, Turoff & Benbunab-Fich, 2000).

Social presence represents the degree to which a medium is perceived as conveying the actual physical presence of the communicating participants, whilst media richness refers to the extent to which a medium can support language variety, feedback, nonverbal cues, and learning. Social

presence theory argues that different media foster different levels of perceived intimacy and immediacy, with a greater perceived social presence having an intensifying effect on media users, increasing involvement, task performance, persuasion, social interaction (Lombard, Ditton & Reich, 1997). Surveys and experimental studies have, indeed, suggested that greater perceived social presence, as afforded by a particular medium – e.g. television or audio and video conferencing systems – results in greater student satisfaction with socio-emotional tasks, such as persuasion, resolving conflicts, maintaining friendly relations, etc. (Hackman & Walker, 1990).

Media richness theory, for its part, establishes that characteristics of media vary in terms of their ability to support task uncertainty and equivocality, and further portrays the fact that when the information processing capabilities of a medium match information processing demands, task performance will improve (Daft & Lengel, 1986; Rice, 1992). In other words, as Rice (1992) explains, "performance is not assured by any particular organizational design, but is contingent on an appropriate match between contextual variables (such as task demands) and organizational arrangements (such as communication structures and media)" (p. 476).

Group interaction and socio-cultural influence theories dwell on the socio-emotional and cognitive benefits of working in groups by explaining that, through group activities, learners build self-esteem, learn to accommodate diverse opinions on issues, enhance their listening and communication skills, exhibit reduced anxiety towards collaborative activities, and generally develop skills needed in workforce and other out-of-school settings (Johnson, Johnson, Holubec & Roy, 1984; Taylor, 2004). Also, whilst group discussions are capable of providing cognitive scaffolding that is essential for higher order thinking, other spontaneous group activities, such as conversations, conflicts, or disagreements (and efforts being made to avoid or resolve them), multiple perspectives, self-explanations (together with explanations to others), and internalization of concepts conveyed from more knowledgeable peers, all contribute towards the group members' cognitive development (Benbunan-Fich et al., 2005; Roper, 2007; Stacey, 2005). The intensity and effectiveness of group processes, however, depend on some personal attributes of individual group members as well as socio-cultural factors prevailing within the learners' context, and in the case of online learning, the medium of communication and underlying technologies adopted.

As pedagogical, media effects and group interaction theories all contribute in serving as a theoretical basis for collaborative online learning, most research works on this mode of learning tend to organize research variables in terms of an input-process-output model (Benbunan-Fich et al., 2005). According to this model, the input factors, or moderator variables (i.e., the technology, course, instructor, and student characteristics) lead to the amount and type of communication and social learning processes that take place within the online environment as well as the perceptions of the environment by participants (mediator or intervening variables), and these, in turn, determine the outcomes of the learning processes in terms of access to all resources and services related the course, faculty and student satisfaction, student learning, and cost effectiveness (i.e., dependent variables).

This model has served as the main framework around which most empirical research studies involving collaborative online learning have been carried out, including studies that compared the traditional classroom learning with online learning. This is because the model lends itself to quantitative, qualitative, and even mixed modes of enquiry. Researchers who adopt the quantitative approach typically measure online learning effectiveness by using experimental or quasi-experimental research designs to test hypotheses and reach valid conclusions about cause and effect of any of the moderating or mediating variables on quantifiable learning outcomes, such as students' exam grades, projects or portfolios, levels of satisfaction and so forth.



Qualitative researchers, on their part, mostly employ ethnographic or case-study methods such as surveys, interviews, protocol analysis, and direct observation to evaluate some or all aspects of particular online courses and then use some form of Grounded Theory (Glaser & Strauss, 1967), to build up conceptual structures and models (Arbaugh & Benbunan-Fich, 2005; Dziuban, Shea, & Arbaugh, 2005; Fjermestad et al., 2005; Hiltz & Shea, 2005).

## Methods and Procedures

As this study sought to examine whatever preconceptions and expectations a particular group of Ghanaian university students bring to a collaborative online learning environment, their attitudes and experiences as they engage in an online course, and their overall perceptions of online learning based on their experience in the course, a qualitative case-study approach, guided by some aspects of the input-process-output model, was adopted.

### *Study Setting*

The study involved a group of undergraduate students who were enrolled in an online course – *Pedagogical Aspects of ICT* – during the second semester of the 2006-2007 academic year at the Regent University College of Science and Technology in Ghana. *Pedagogical Aspects of ICT* is a three credit course designed to introduce students to the foundations of ICT use in education. Originally designed as a traditional lecture-based classroom course, the course was reconfigured as an online project-based collaborative learning course for the purpose of introducing students to online learning. Course activities were therefore designed to allow students to work with various technology initiatives, work collaboratively, and experience what learners in an online course typically experience.

Both constructivist and objectivist pedagogies framed the learning activities of the course. From the constructivist perspective, supports for the learning activities were developed using Jonassen's (1999) model for constructivist learning environments. This model suggests the provision of a range of resources, tools, and supports within the learning environment to assist learners engage in authentic activities such as projects, solving problems, resolving cases, etc. By engaging in such activities, learners will be able to analyze and explore the problem situation, articulate their solutions, and reflect on the outcomes and their experiences (Bennett, 2003). Thus, for the duration of the course, students were expected to work collaboratively in groups of two or three on specific projects that involved finding solutions to real-life education or training problems. Projects included researching and writing conceptual pieces on issues, such as the digital divide, distance learning and so forth, creating multimedia learning resources, creating instructional websites, etc. All relevant resources and supports were provided, and students self-selected their groups and project topics. Students were assessed on their respective levels of group collaborative activities (which were monitored online), as well as the quality of their final presentations. This aspect of the course carried a total of 40 percentage points.

Objectivist (traditional) design principles were included in the course because it was presumed that, as "traditional" students who were being introduced to collaborative online learning for the first time, a purely constructivist, ill-structured learning approach would have been drastically removing them from their "comfort zone" and might have contributed to a high attrition rate. Thus, the course was organized in modules of sequenced lessons that were focused on learning new concepts and principles. For each module, students were required to read some recommended texts, participate in online instructor-led discussions, take an online quiz, and in

some cases, submit written responses to assignment questions, all of which were graded for a total of 60 percentage points. Six modules were completed over the 16 week period.

The platform for delivery of the course was *Claroline*, an open source Web-based Learning Management System that has been customized for use at Regent University under the name *eCampus* (see <http://www.regentghana.net/ecampus/>). Course document uploads and downloads, exercises, announcements, discussions, and chat sessions all took place within this platform, and every activity was recorded together with such details as identities of persons, time of day, length of activity, etc. Communication between instructor and students was mainly by email – also accessible through the *eCampus* platform.

## ***Participants***

Twenty six undergraduate students ( $n = 22$  male;  $n = 4$  female) of Regent University voluntarily registered to take the course. The instructor met the students face-to-face on two occasions, and gave them a brief introduction to the course, and discussed all issues associated with the online processes that they were due to go through for the rest of the course.

## ***Data Collection and Analysis***

Two sets of survey questionnaires (developed and pre-tested by the researcher) were administered online, using an online survey tool. The first questionnaire sought basic background information about the students as well as their general opinions, levels of preparedness, and expectations of the course they were about to engage in, and about online learning in general. The second questionnaire, administered at the end of the course, sought to obtain students' perceptions and levels of satisfaction with the course, and included such items as course content and activities, delivery platform, communication, learning outcome, instructor role, and institutional role. Notes were also collected through the instructor's observation of all students' online communication activities throughout the semester, whilst records of all student activities on the course platform, including individual one-to-one email correspondences with the instructor, were also accessed.

Quantitative data, made up of activity statistics logged by the server of the course website and some survey results, was tabulated and analyzed mainly by descriptive statistics with the aid of Microsoft Excel. Qualitative data, consisting of the instructor's journal entries and students' responses to open-ended questions in the questionnaires, was analyzed for emerging themes and consistency with quantitative data.

# **Results and Discussions**

## ***Learner Characteristics***

Twenty-two students ( $n = 18$  males;  $n = 4$  females) completed the initial demographic and course expectation questionnaire. Over 70 percent of students were in the age range of 20 to 25 years, and most were in their first year at the University. The majority of students also reported that they were fairly proficient in the use of computers and the Internet, whilst only five students indicated that they had access to computer and Internet facilities outside the university campus, though they added that irregular power supply was likely to hinder their ability to fully use these resources. All students, however, indicated that they had never participated in an online learning activity prior to the present course. On their level of preparedness to take an online course, almost all

students indicated that they were fully prepared and also expressed optimism that they will learn a lot and also do well, despite the fact that they were all full-time students and each was taking at least four other face-to-face courses.

### ***Students' Expectations of the Online Learning Process***

The first research question sought to understand the general expectations and concerns of Ghanaian "traditional" university students who were being asked to take a course where all teaching and learning activities will be carried out online. The initial questionnaire administered to the students thus contained a series of statements that addressed students' expected level of participation, the personal and environmental factors that were likely to influence participation, and the expected outcome of the learning experience. An open ended question asking students to write down their general opinions and concerns was also included.

Students' general outlook was that despite their restricted access to the Internet, they were capable of spending about 6 -10 hours a week on the course. Quite a significant number (> 60%), however, indicated that the lack of face-to-face learning activities, the lack of a final exam and their participation in other classroom-based courses, were likely factors that could negatively influence their ability to participate effectively in the course. Students said this was the case because they spend almost all their time attending classes (as absence will be noticed by the instructor) and studying for exams, and so an online class that has no such attendance requirements and exams was not motivating enough. They were pleased that they could take a course without having to attend classes at some scheduled times, however.

Analysis of the text of students' responses to the open-ended questions as, well as the instructors' notes yielded two main categories: (a) learning styles and expected benefits, (b) and drawbacks of the online learning activity. From their responses and actions, most students exhibited some amount of uneasiness as it dawned on them that they were being called upon to adopt quite a different learning style – self-directed learning. As this represented a radical departure from the teacher-led instruction that they have been used to over the years, two students expressed their concerns this way:

Student 1:

*Well I do not personally enjoy the style of the course. I believe I would have enjoyed it much if it was a class based course.*

Student 2:

*Because it turns out to be that we do not have a personal touch with the teacher and practical aspects of the course it makes it more ineffective for me.*

For the expected benefits and drawbacks category, students generally expressed mixed feelings. The more matured and more motivated students (these were a minority though) were hopeful that they will benefit from the course as evidenced by the following written statements from two students:

Asunka

Student 3:

*This course has been exciting from its introduction stages and I perceive at the completion of the course my computer knowledge and the use of technological devices will increase tremendously.*

Student 4:

*I believe this will give me my first experience with online education, and I'm certain that I will learn as much as I would if this course were to be held in the classroom.*

From the instructor's observation, it was apparent that such students were well aware of the challenges they were about to encounter but, probably due to their prior experiences, they were confident that they will complete the course successfully.

On the other hand, majority of the students were less hopeful of attaining any fruitful learning experience, and therefore appeared to a bit disinterested, with some laying blame on the University's inability to provide high-speed Internet access as major drawback. One student summed up as follows:

*First of all, I don't think I have a proper understanding of the course (i.e. in terms of course description). As to what we're expected to learn and to know (or become) at the end of day I don't know. I'll be glad, if you are able to expand on these two areas for me.*

This particular student's sentiments were shared by most others, as subsequent one-to-one inquiries by the instructor via email revealed that such students did not fully appreciate how online instruction could possibly replace classroom lectures. "But there is not class periods, no mid-terms, revision period and no exams, so when do we actually learn?" was a remark made by one student in an email response when asked why he appeared so ambivalent about the course. Such thinking is probably informed by the mindset, particularly within the African context, that online learning is second best (Saint, 1999) and, indeed, some African countries have adopted a policy of not recognizing foreign credentials obtained through online courses, citing problems of quality control and accreditation (UNESCO Institute for Information Technologies in Education, 2002).

On the whole, however, the students could be described as willing (albeit reluctantly on the part of some) to take an online course, the infrastructural constraints notwithstanding. As a crucial input factor, it was certain that these learner characteristics could directly influence the amount and level of learning processes that were due to take place. A few adjustments to the original design of the course – i.e., relaxing deadlines – were therefore made.

### **Students' Online Attitudes and Behaviors**

All participating students were found to be capable of logging in and accessing the tools and resources of the course as they logged in about 55 times each on average over the course of the semester. This translated to an average of about three sessions a week per student over the 16 week duration of the course. Also, on average, each student spent close to one hour logged into

the course, and also downloaded about 14 out of 32 documents that were provided by the instructor. Accessing the course platform was therefore not a problem for students, but they were less enthusiastic about participating in collaborative activities and also in the use of the discussion board.

Eighteen ( $n = 18$ ) students were recorded as having ever logged into the discussion forum, but only 11 (44 percent of all students) contributed discussion posts throughout the duration of the course. All discussion threads were started by the instructor, and even though opportunity was given for students to start any discussion topic of their choice, none did. They all responded to the instructor's posts rather than commenting on, or expanding on each other's ideas. In total, five main topics were covered, each lasting for about three weeks. The posting of messages, however, dropped progressively from 14 in the first topic to one by the last topic, and no amount of intervention from the instructor could get the students to post any messages. Yet, all students who responded to the post-course survey questionnaire ( $N = 9$ ) indicated that they found the discussion board useful, including two students who never even accessed the forum.

Limited student participation by way of written contributions in asynchronous online discussions appears to be a widespread phenomenon (Cheung & Hew, 2004; Hewitt, 2005), and this has been attributed to factors such as unfocused or off-track discussions, lack of encouragement on the part of the instructor, technical difficulties, inappropriate course design etc. (Dennen, 2005; Prece, Nonnecke & Andrews, 2004). In this study, however, none of these factors (aside probably the course content and discussion format), could be identified to be directly responsible for student inactivity. Access and ability to use the technology was not an issue as students could log into the course platform as and when they wished, and most were occasionally able to engage in hearty conversations with each other and with the instructor through the *eCampus* chat room. The instructor also constantly encouraged students by giving positive feedback on their posts and also made students aware that each will be awarded extra credit anytime they contributed meaningfully. Moreover, students who were noticed not to have logged into the discussion forum were sent personal email messages urging them to do so, yet only a few complied, and none came up with a reasonable explanation for their non-participation. One student, however, was frank enough to ask the instructor "Why don't you just come and lecture us and go?"

This situation could partly be attributed to lurking on the part of some of the students – i.e., observing, and possibly benefiting, from a setting without contributing in any noticeable way (Dennen, 2008; Prece et al., 2004). Thus each discussion topic was accessed (read) at a significantly higher number of times by the students as compared to the number of posts made. For instance the first topic recorded a total 122 hits by 18 students, yet only six students made a total of 14 posts (excluding the instructor's responses). This high incidence of online lurking was probably a carry-on from the traditional classroom practices, where most students tend to be comfortable sitting quietly and listening to whatever is taking place and making notes to themselves. However, as meaningful discourse is, discourse being one of the main goals of constructivist learning (Jonassen, Davidson, Collins, Campbell & Bannan-Haag 1995), lurking is clearly not applicable in constructivism. The question then arises as to whether the lurkers were actually learning in this context, but this is a subject for further investigation.

In terms of the group activities, there was little evidence of collaboration as students turned in their final projects individually, whilst group discussion forums that were set-up on the course platform were hardly accessed, despite emails (both broadcast and individual) being sent to them on an almost daily basis.

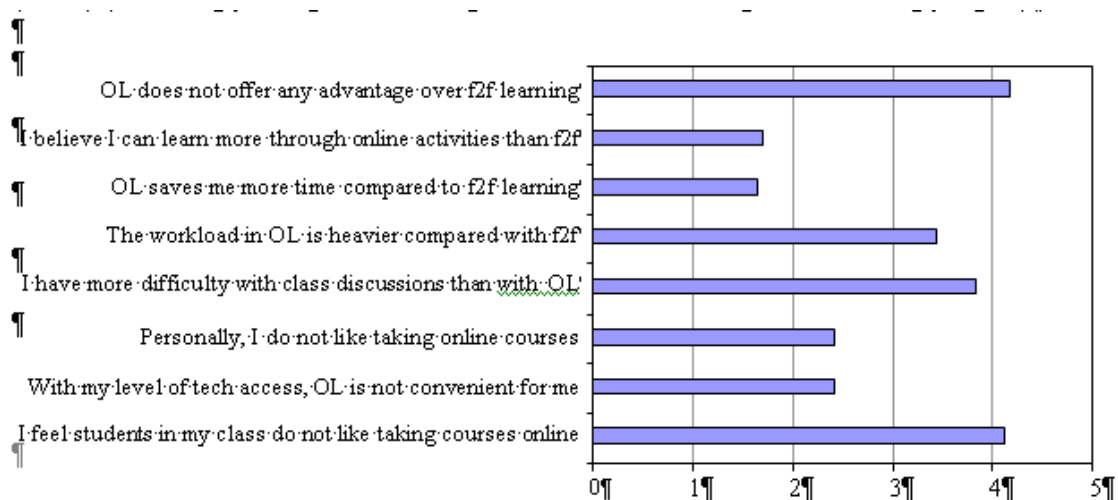
## Students' Perceptions of the Online Learning Environment

To understand students' perceptions of online learning based on their experiences, one output factor of the learning activity was measured, and that was student satisfaction with the learning processes. Only nine students, however, completed the post-course survey (despite repeated appeals from the instructor), and their general perceptions were obtained by calculating an average score for students' level of agreement with each of a set of statements. On the whole, majority of the respondents were of the view that communication with the instructor contributed in motivating them to pursue the course, and that the learning platform was fairly easy to use.

Forty-four percent of the respondents however strongly agreed that they did not find the style of learning very useful, with only 33 percent indicating that they had benefited from the course. Also, only 33 percent indicated that they were satisfied with the way the course was conducted, but a greater percentage (44%) had no opinion on this question. On the other hand, 66 percent indicated that they will take an online course again if given the opportunity.

In terms of their overall perceptions of collaborative online learning based on their experiences in the course, students were generally held the view that online learning offers no advantage over face-to-face. Figure 1 provides a summary of how the students perceive some factors about online learning.

**Figure 1.** Mean ratings of students' agreement with statements regarding Online Learning (OL) (N = 9) (1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)



These mixed results were confirmed by content analysis of the text of students' responses to open-ended questions and email enquiries. Two categories were identified: (a) time; and (b) lack of motivation for independent learning.

It was clear that some students' perceptions of online learning being helpful or otherwise had more to do with their ability to fit the online study activities around other academic (mainly classroom based) responsibilities. Being involved in other courses that had daily or weekly face-to-face meetings, assignments to turn in, mid-term and final examinations, students treated the online course as a part-time issue that was only to be handled when they were less busy. The following comments by two of the students capture this issue:

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Student 1:

*Most students did not give attention to activities in this course. I think this is because a great chunk of our courses are taught using classroom method so concentration was given there.*

Student 2:

*With a lot of pressure from classroom learning, students tended to postpone the online learning activities. I would have enjoyed the course better if all students were participating especially in discussions and forums just as you see in lecture halls.*

Students' motivation for learning in general, and online learning in particular, was another identified category that influenced students' perceptions of online courses. The bulk of the students were not enthusiastic about learning independently, and this can be attributed to their being accustomed to the didactic teacher-led mode of instruction, having just come in from high school. Upon registering for a course, students expect to attend lectures, take notes, and at a later date, read these notes and write an exam. Collaborative online learning, however, represents a radical departure from these set of activities and students had great difficulty readjusting to the requirements of this new mode of learning. In most cases, it had to take repeated reminders and warnings from the instructor before some students would feel the need to log into the course site and engage in any learning activity. It was therefore not surprising that quite a significant number of those who responded to the post course survey indicated that they did not find the style of learning useful. Others also simply dropped the course without saying a word to the instructor, or first seeking help for whatever difficulties they were encountering. Indeed, only eight students satisfied all the requirements of the course.

### **Limitations of the Study**

The limitations of this study are attributable to the following factors and assumptions:

1. Study participants were not randomly selected and therefore not representative of the entire student body.
2. The researcher was the instructor of the course and this might have influenced student responses to questionnaire.
3. The course was designed with the assumption that all students will engage in online discussions and group activities, whilst students' input was not sought prior to the design of course activities as constructivism demands. This might have alienated some students as they probably had concerns that were not addressed. Also, the reliance on text only as the main mode of delivery and interaction might not have been suitable for all learners, though this was a deliberate choice due to the anticipated bandwidth constraints.
4. Unlike typical online courses where most students are located in diverse geographical areas, the group of students involved in this study had personal physical contacts with each other as they were involved in other classroom based courses. Thus records of students' online collaborative activities probably did not represent all the interactivity that took place pertaining to the course.

## **Conclusions and Recommendations**

As the current state of Internet connectivity in higher education institutions in Africa has been described as "too little, too expensive and poorly managed" (Gakio, 2006, p. iii), it is not surprising that Internet use in education is still fairly limited in these institutions. In cases where the technology is adopted, it is either implemented as components (e.g., email) of the existing correspondence-type distance learning programs (Axmann, Fourie & Papo, 2002; Rumajogee, 2002), or as add-ons to class-based courses for the reproduction and distribution of course documents (Bongalos Bulaon, Celedonio, deGuzman & Ogarte, 2006; Dutton, Cheong & Park, 2004b). Most research work associated with online learning within the African context is thus conducted under the umbrella of open and distance learning, with most reporting on favorable learner perceptions of this mode of learning due to its openness and flexibility (e.g., Ambe-Uva, 2006; Howell, Harris, Wilkinson, Zuluaga & Voutier, 2004; Ojo & Olakulehin, 2006).

These studies, however, mostly involve surveying and/ or interviewing random samples of students who have participated in technology-enabled distance learning programs, and reporting on these students' self-reported perceptions. Whilst this represents a more convenient and more generalizable approach to understanding students' perceptions, it is clear from the present study that students' self-reported perceptions sometimes do not reflect their unique experiences with the online learning environment. A case in point is some students reporting that they found the discussion forum useful, though the records indicated that they never logged onto the forum. The implementation of online learning initiatives within the African context should therefore not only be informed by students' self-reported perceptions, but by more in-depth empirical studies strategically designed to unravel all the contextual factors that influence the effectiveness of such learning initiatives.

This study, though limited in terms of participant response (and thus making firm and generalizable conclusions impossible), also reveals that learner motivation, possibly influenced by some environmental and socio-cultural factors (at least in the Ghanaian context) is a dominant input factor that determines the success or otherwise of an online course. Whilst it remains possible that the lack of adequate access to computer and Internet facilities could have contributed in making students less enthusiastic about the online activities, the design and style of delivery of the course could have also contributed to learner disengagement as pointed out previously. Possibly, if emphasis was placed less on online discussions and group activities, but more on other learning activities, such as individual responses to assignments and exercises, or the use of other outlets for students to express themselves, students might have responded more positively.

Subsequent studies of this nature should therefore not only seek learner input in the design of course activities, but should also involve the adoption of strategies that will stimulate student engagement, and give them more opportunities (e.g., blogs, wikis, etc.) to express themselves. For campus-based students, a hybrid or blended course (i.e., one that blends online and face-to-face delivery) might be the most appropriate, as the occasional in-class activities will help alleviate students' distress with the online interactions. The issue of online lurking can also be studied through such hybrid courses.

On the whole, it is understandable that many people, especially in the developing world, perceive online learning as inferior to class-based learning, but when students fail to participate effectively when offered an opportunity to take one "easy" online course in addition to their normal classes, one is inclined to agree with Castro's (2000) assertion that ". . . introducing technology into



educational institutions is not a technical issue but a sociological experiment. The hurdles are not technical but have to do with the internal logic of the institution, with built-in incentive systems, with values, with expectations, and with prejudices. It is not a chapter in the science of technology but in the art of institutional change" (p. 15).

Integrating technology effectively into mainstream teaching and learning within higher education institutions in Sub-Saharan Africa, therefore, requires more empirical studies, similar to the current study reported here, that have the potential of leading to a fuller understanding of all the "sociological" issues that are probably unique to particular institutions or countries.

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## Appendix

### Pedagogical Aspects of ICT

#### Student Preparedness and Expectations Questionnaire

Please respond to all the questions listed below as accurately as you can.

**1. Age**

19 or less  20 - 25  25- 30  31 and above

**2. Gender**

Female  Male

**3. Year of Study**

First  Second  Third  Fourth

**4. What is your enrolment status at Regent University?**

Full Time  Part Time

**5. How many courses (including this one) are you taking this semester?**

Only this one  2  3  4  5 or more

**6. About how many hours a week do you think you can spend on this course?**

5 or less  6 - 10  11 - 15  16 or more

**7. What do you consider to be the level of your computer/technology skills?**

Beginner  Competent  Proficient  Expert

**8. What type of technology access do you have outside the University campus?**

- I have a personal computer but no internet connectivity
- I have access to a computer only part of the time
- I have a personal computer with internet connectivity
- I only have access to a computer with internet part of the time
- I have no access to a computer

**9. What is your experience with online learning?**

- I have taken a fully online course before
- I have never taken an online course before
- I have taken a part online (hybrid) course before

**12. Have you ever taken a course that used the Regent University *eCampus* Learning Management System for instruction delivery?**

No  Yes

**13. In your opinion, when comparing an online course with a normal classroom course,**

- students taking an online course learn equally as those who attend face-to-face classes
- students taking a face-to-face course learn better than those who take an online course

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- O students taking an online course learn better than those who take a face-to-face course
- O I cannot tell which method of learning is better

**14. How do you think each of the following factors is likely to impact negatively on your ability to participate fully in this online course? Please indicate your answer by choosing the appropriate code**

	Answer Code				
	1	2	3	4	5
(1) Highly Unlikely (2) Unlikely (3) Neutral (4) Likely (5) Very Likely					
1 - My participation in other courses	O	O	O	O	O
2 - My inability to see and talk to the instructor of this course	O	O	O	O	O
3 - The absence of lectures and other classroom activities	O	O	O	O	O
4 - The absence of a final written examination	O	O	O	O	O
5 - My ability to participate in group work	O	O	O	O	O
6 - Lack of regular electric power supply on campus	O	O	O	O	O
7 - My level of access to computer and internet connectivity	O	O	O	O	O
8 - My level of access to library books and other resources	O	O	O	O	O
9 - The University campus environment	O	O	O	O	O
10- My level of computer and internet skills	O	O	O	O	O
11- My other personal obligations	O	O	O	O	O

**15. Write down any other general opinions or expectations you have about this online course you are about to take**

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## Student Experiences Questionnaire

Please respond to all the questions listed below as accurately as you can.

**1. How did you gain access to a computer and the internet to partake in this course?  
(Select all that apply)**

- Through my personal computer
- Through the Regent University computer resources
- Through a third party i.e. a friend, internet café, work place etc.

**2. On average, how frequently were you able to access the course on *eCampus* during the semester**

- Daily
- 3 to 4 times a week
- 1 to 2 times a week
- Once a while

**4. On average, how many hours a week did you spend logged into the course during the semester?**

- Less than 4 hours
- 4 - 6 hours
- 8 - 10 hours
- 11 hours or more

**5. I spent ----- time on this course as compared to each of the classroom-based courses that I have participated in at Regent University.**

- less
- the same
- more

**6. Did you incur any extra cost by virtue of your participation in this course?**

- No
- Yes

**7. What is your opinion about the class size (number of students)?**

- too small
- just right
- too big
- no opinion

**8. Would you recommend this course to other students?**

- No
- Yes



**9. Please indicate your opinion with regard to each of the following statements about the course by selecting the appropriate answer code (i.e., 1 = Very Useful ---. 5 = Not Very Useful)**

(1) Very Useful (2) Useful (3) Neutral (4) Not Useful (5) Not Very Useful	Answer Code				
	1	2	3	4	5
1 - The subject area covered by the course	O	O	O	O	O
2 - The role played by the instructor of the course	O	O	O	O	O
3 - Working in groups	O	O	O	O	O
4 - The discussion forum on <i>eCampus</i>	O	O	O	O	O
5 - The links to other external web resources	O	O	O	O	O

**10. Please indicate your opinion with regard to each of the following statements about the course by selecting the appropriate answer code (i.e. 1 = Very Easy ..... 5 = Very difficult)**

(1) Very Easy (2) Easy (3) Neutral (4) Difficult (5) Very Difficult	Answer Code				
	1	2	3	4	5
1 - Connecting and logging into <i>eCampus</i> anytime	O	O	O	O	O
2 - Connecting and logging into <i>eCampus</i> from anywhere	O	O	O	O	O
3 - Use of the <i>eCampus</i> interface	O	O	O	O	O
4 - Getting technical support when having difficulties with <i>eCampus</i> or other computer problems	O	O	O	O	O
5 - The reading material for the course	O	O	O	O	O
6 - The exercises and other assignments	O	O	O	O	O
7 - Communication with the instructor through <i>eCampus</i>	O	O	O	O	O
8 - Communication with other students through <i>eCampus</i>	O	O	O	O	O
9 - Uploading and Downloading content through <i>eCampus</i>	O	O	O	O	O
10- Contributing to class discussions through the discussion forum of <i>eCampus</i>	O	O	O	O	O
11- Working in groups through the <i>eCampus</i> platform	O	O	O	O	O
12- In comparison with face-to-face courses, the learning activities in this course were	O	O	O	O	O

**11. Please indicate your level of agreement with each of the following statements regarding the content and activities of the course you have just participated in. Select the appropriate code (i.e. 1 = Strongly Disagree ---.. 5 = Strongly Agree)**

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	Answer Code				
	1	2	3	4	5
1 - The course had clear objectives	O	O	O	O	O
2 - The course readings and activities were relevant to the objectives of the course	O	O	O	O	O
3 - The exercises and assignments were graded fairly	O	O	O	O	O

4 - I did not enjoy working with my other group members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 - The online collaborative activities contributed to my understanding of the course content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 - The instructor's interactions online encouraged me to get the most out of my learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 - I participated more in this course than I normally do in classroom courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 - I would have preferred taking down my own notes in class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10- Overall I am very satisfied with the way the course was conducted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**12. From your experience in this course (and other online courses that you might have taken), indicate your level of agreement with the following statements regarding online learning. Select the appropriate code (i.e. 1 = Strongly Disagree ---.. 5 = Strongly Agree)**

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	Answer Code				
	1	2	3	4	5
1 - To me, online learning does not offer any advantage over classroom learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 - I believe I can learn more, or would learn more through online activities than through classroom lectures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 - Online learning saves me more time compared to attending classroom lectures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 - Online learning is more cost effective compared to attending classroom lectures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 - Compared to classroom learning, the workload for collaborative online learning is too heavy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 - I have more difficulty contributing to classroom discussions than I do with online discussions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 - I enjoy online learning much more than I do with classroom learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 - I interact more with my instructor and with other students in the online environment than in the normal classroom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 - With my current level of access to computer and internet facilities, online learning is not convenient for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10- I feel students in my class do not like taking courses online	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11- Personally, I do not like taking courses online	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12- I believe Universities in Ghana are capable of offering fully online courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*Asunka*

**13. Write down any other general opinions you have about this online course or online learning in general.**

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# Predictors of Learning Satisfaction in Japanese Online Distance Learners

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## Abstract

Japanese distance education has been slow to utilize the Internet, and mainly depends on the mail system and, to a lesser extent, television broadcasting as its mode of delivery. Since 2001, however, regulations have been relaxed to allow students to complete all course requirements for a university degree via online distance learning. This paper reports the results of a questionnaire study administered to the students ( $N = 424$ ) enrolled in one of Japan's few online distance universities. Satisfaction with learning was explored by examining students' opinions and learning preferences in regard to five aspects of distance learning identified as important: (1) learner-teacher interaction, (2) learner-content interaction, (3) learner-learner interaction, (4) learner-interface interaction, and (5) student autonomy. In addition, the analysis included students' responses to three open-ended questions. Results indicate that students were generally satisfied with their learning, and that, specifically, learning satisfaction was higher for students who: (1) could persevere in the face of distance learning challenges, (2) found computers easy to use, (3) found it easy to interact with instructors, and (4) did not prefer social interaction with others when learning.

**Keywords:** Japan; distance learning; distance education; online learning, online education; e-learning

## Introduction

Garrison and Shale (1987) wrote that the distinguishing feature of distance education was that it could "extend access to education to those who might otherwise be excluded from an educational experience" (p. 10). Now 20 years later, access to learners has greatly increased due to several factors, one of the most important factors being technological developments facilitating the worldwide spread of the Internet. Particularly, adult learners

who live at a distance from educational institutions, or who lack the time to attend face-to-face classes due to the demands of work and family, have benefited from the growth of distance learning, and older “non-traditional students,” make up the majority of many post-secondary distance learning programs.

Despite the successes in terms of increased access to education, quality issues are still much debated in regard to distance learning. Although the question of whether distance learning courses can be as effective as face-to-face courses has largely been answered in the affirmative (Russell, 1999), teachers and program designers still face challenges in deciding how to best design learning programs so that they will be effective for a broad range of students. Anderson (2003) has written of the challenge of “getting the mix right” among three dimensions of learning: (1) teacher interaction, (2) content interaction, and (3) student interaction. Anderson’s equivalency theorem states that individual students may need or may prefer different mixes of activity types, and, importantly, if the quality of the educational experience in any one dimension of interaction is high enough, “sufficient levels of deep and meaningful learning can be developed...” (p. 4). This theorem supports learner differences and counters the idea that there is one best way to teach or learn at a distance.

When designing distance learning programs, the task of “getting the mix right” becomes more challenging within the growing cross-border educational contexts that distance learning facilitates. Asian countries, with their large populations and growing economies, stand well-poised to benefit from the development of distance learning, both in their own educational institutions and when their students attend the institutions across borders via distance education. Theorists (Hofstede, 1986; Moore, 2006; Swan, 2004), however, have suggested there may be important differences in how students from different cultures view the learning process and prefer it to take place.

Jin and Cortazzi (1998), in a cross-cultural questionnaire study with Chinese and British students attending traditional lecture classes in their own countries, found differences in the “culture of learning,” and, in particular, views on the ideal role of the teacher in the learning process. Gunawardena, Nolla, Wilson, Lopez-Islas, Ramirez-Angel, et al. (2001), in a large cross-cultural questionnaire study with Mexican and American students, found cultural values affected perceptions of group development processes when students interacted online. Morse’s (2003) exploratory case study with online learners found that a group of mixed Asian students had stronger preferences for immediate feedback from the teacher and a greater interest in interaction with other students than did a group of predominantly New Zealander students. New Zealander students, on the other hand, were more appreciative of the convenience provided by distance learning than were Asian students. Morse therefore suggests it may be a mistake to assume that “one size fits all” when teaching online classes with learners from other cultures, because although these two groups were culturally dissimilar, the Asian students were even more dissimilar because they were studying as foreign students using a second language.

With the increase in cross-border educational contacts facilitated by the Internet, there is a greater need for understanding of the approaches to learning required to support students from other cultures in order to “get the mix right” and to avoid projecting false or stereotypical images onto them or ignoring important differences. To meet this need, the present study was undertaken with the students of one of Japan’s few online distance universities to determine the relationships between their learning satisfaction and (1) their

opinions about distance learning, (2) general learning preferences, and (3) demographic variables.

## **Japanese Education Background**

Japanese higher education is well-developed with a 50.1 percent advancement rate from high schools to degree-granting institutions; it is also dominated by traditional students, ages 18 to 22 (MEXT, 2006). Although rigorous study for university entrance exams often occurs in the high school years, university degree programs are generally considered less demanding, and the graduation rate for Japanese university students (91%) is the highest of the 30 countries surveyed by the OECD, which showed the average graduation rate of 71 percent (OECD, 2007). Japanese distance education, however, is more focused on providing educational opportunities to non-traditional-aged students, particularly those who are already working or having responsibilities at home. In 2007, 274,120 students were seeking degrees in 57 distance learning programs, accounting for 9.7 percent of total higher education enrollees (MEXT, 2007). Fifty-four of these programs are actually the correspondence education divisions of existing universities, while three of the programs were distance learning institutions.

It is important to note that Japan has been relatively slow to utilize the Internet in its distance learning programs, and a considerable amount of its distance education still utilizes the mail system or, to a lesser extent broadcast television, as its mode of delivery. In 2003, Japan ranked 23rd in e-learning readiness rankings done by the Economist Intelligent Unit and IBM (2003), lagging behind Korea (ranked 5th) and Singapore (ranked 6th). Central government policy coordinated through the Ministry of Education, Culture, Sports and Technology (MEXT), has much responsibility for this, as it strongly regulates both public and private universities.

Distance education via the mail system (i.e., correspondence learning) was first recognized by the MEXT in 1950, and since then it has been regulated differently from traditional on-campus education. Until 1998, MEXT required that 30 credits out of the 124 credits required for graduation be taken through face-to-face classroom teaching, called "schooling." In March 1998, this regulation was relaxed to allow the 30 credits to be taken through synchronous media such as videoconferencing. Three years later, in March 2001, it was relaxed again to allow the 30 credits to be taken through videoconferencing via the Internet. This made it possible for distance education programs to exist solely at a distance without requiring students to come to a campus or a study centre. The university where this study took place opened in 2004, and remains only one of a few universities in Japan where students can study entirely online at a distance.

Although government regulations have been relaxed, few programs utilize the Internet for distance learning in any substantial way. There has been much discussion about the possible reasons for this, including administrative and faculty resistance to change; however, some educators in Japan suggest that another reason may be that Japanese cultural values and educational traditions, which typically emphasize teacher-directed learning within a context rich face-to-face environment, may conflict with a form of educational delivery that emphasizes student autonomy and communication through electronic media at a distance (Jung & Suzuki, 2006; Kubota & Fujikawa 2007; McCarty, 1999). Research on Japanese distance learners' views remains lacking, however, and opinions about distance learning's potential often are based on educators' experiences with

traditional face-to-face students or on small case studies with distance learners. For example, Kubota and Fujikawa (2007), in one of the few studies examining distance learning in Japan, found many undergraduates studying in a distance version of an Introductory Finance class, would not recommend the course to a friend. It should be noted, however, that these students were enrolled in a traditional face-to-face university degree program and taking one experimental distance learning course, and as such, these results may not be applicable to other learner groups, and specifically adult learners who self-select to study in a distance learning institution. The present study, therefore, has the goal of bringing the opinions and preferences of students who study in a distance learning institution into this discussion of the suitability of distance learning for Japanese learners.

## **Literature Review – Study variables**

### ***Learning Satisfaction***

“Student-perceived learning” or “learning satisfaction” often are included as dependent variables in distance learning research (Chen & Willits, 1998; Fredericksen, Pickett, Shea, Pelz, & Swan, 2000; Marks, Sibley & Arbaugh, 2005; Stein, Wanstreet, Calvin, Overtom & Wheaton, 2005). These function as indicators of learning itself, and are used because of the inconsistencies associated with teachers’ measuring internal processes that are not directly observable. Knowing the predictors of learning satisfaction would be useful to inform program design and learner support systems in related programs, and as a consequence, the present study was designed to determine which aspects of students’ distance learning experience were important influences on learning satisfaction.

### ***Distance Learning***

Initially, a literature review was performed to identify the aspects of students’ distance learning experience most likely to influence learning satisfaction. Review of the work of Moore (1989; 1972) revealed four important aspects of the distance learning experience: (1) learner-teacher interaction, (2) learner-content interaction, (3) learner-learner interaction, and (4) learner autonomy. These four aspects of the learning experience were selected as the main study variables. A fifth aspect of the learning experience discussed by Hillman, Willis, and Gunawardena (1994), learner-Interface Interaction, was added as a minor study variable (See Table 1).

**Table 1.** Study variables

Independent Variables	Dependent Variable
Learner Autonomy	Learning Satisfaction
Learner-Teacher Interaction	
Learner-Content Interaction	
Learner-Learner Interaction	
Learner-Interface Interaction	

It should be noted that learner-content interaction was defined differently from Moore's writings about course structure. Moore focused on the rigidity of course structure, which he proposed leads to greater transactional distance, defined as a "gap of communication and understanding between the teacher and learners" (Moore & Kearsley, 2005, p. 223). The present study, instead, focused on the clarity of course content following the work of Chen and Willits (1998) and Stein, Wanstreet, Calvin, Overtoom and Wheaton (2005), who proposed that course structure also could function to reduce transactional distance and act as a facilitator of learning at a distance.

## Research Questions

*Research Question 1: In general, how satisfied were students with their learning in this online distance education program?*

*Research Question 2: To what extent was student learning satisfaction predicted by a regression model containing the questionnaire subscales, and the demographic variables?*

## Methods

### *Study Population*

The population of this study was comprised of undergraduate students enrolled in an online distance university located in a major urban area of Japan. Students attending this university take all, or nearly all, of their classes via the distance mode. Approximately half the classes offered utilize synchronous lectures that students can watch and respond to from their homes in real time. Recorded versions of these lectures, however, also are made available for students to view at times they find convenient, and the majority of classes are viewed in this manner. In addition, approximately half of the classes offered are much like traditional correspondence classes, in which students read textbooks, write assignments, and take tests at home. Nonetheless, students do use the Internet to submit their work to their teachers via a drop-box in the class website.



## ***Instrumentation***

A questionnaire, the Distance Learning Questionnaire (DLQ), was developed by the researchers for use in this study and contained closed-ended Likert five-point scale items (ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), open-ended question items and demographic items. The DLQ contained the following three main sections: (1) Opinions of Distance Learning, (2) General Learning Preferences, and (3) Demographic Information.

The main scale in this study was the Opinions of Distance Learning Scale, consisting of 18 items. Four items were written for each of the four main study variables, and two items were written for the minor study variable, Learner-Interface Interaction. The second scale, General Learning Preferences, consisted of eight items, with two items written for each of the four main study variables. Items were generally phrased in terms of ease or difficulty of interaction within each variable. For example, in regard to learner-learner interaction, two of the four items were:

*Item 4: It is easy to exchange opinions with other students about the course.*

*Item 15: It is difficult to develop relationships with other students.*

In addition, two items were developed to measure the level of student satisfaction, and these were worded differently:

*Item 10: All in all, I am satisfied with my learning in this distance learning program.*

*Item 21: All in all, based on my own experience, I would not recommend distance learning to my friends.*

Finally, three open-ended items were added to this questionnaire following the assumption that “collecting diverse types of data best provides an understanding of a research problem” (Creswell, 2003, p. 2). The three open-ended items were:

*Item 11: In terms of your learning, what are the advantages of distance education?*

*Item 22: In terms of your learning, what are the difficult aspects of distance education?*

*Item 31: Thinking about your learning in general, what is your learning style and how do you prefer to learn?*

Students' responses to the open-ended items were first translated into English and then coded and placed in themes, where percentages of each theme were calculated to facilitate comparison.

## ***Procedures***

Questionnaire development began in March 2005, based on a literature review and the distribution of an exploratory open-item questionnaire, as well as interviews with students and staff at the university. The questionnaire was first written in English and then, in

cooperation with one of the research team members who is Japanese and also a fluent English speaker, was translated into a Japanese version. To check reliability, back-translation into English was later performed by professional translators unfamiliar with the project. Finally the questionnaire was made available to students on the university's website in December 2006.

### ***Data Analysis***

The main form of data analysis to be presented is the results of the multiple regression analysis used to determine what aspects of the students' experience best predicted student learning satisfaction. Subscale means and means of individual items are presented where they were able to add to the analysis. Results of the qualitative data are presented separately and later converged in the discussion section as suggested by Creswell and Plano Clark (2007).

## **Results**

### ***Demographic Results***

Of the 1,414 students enrolled in the university at the time the questionnaire was made available to students, 424 completed the entire questionnaire, resulting in a 30.3 percent response rate. This volunteer sample was predominantly female (74.0%), which is slightly higher than the study population of 69.0 percent. The average age of students was 36.1 years, and 8.6 percent of students were traditional-aged students, 19 to 22 years; 20.1 percent were 23 to 29; 36.2 percent were 30 to 39; 25.3 percent were 40 to 49; and 9.9 percent of students were age 50 to 72 years. The majority of students responding (51.5%) had entered the university within the past year, and 46.5 percent of students reported having had previous distance learning experience.

### ***Factor Analysis***

Suitability of factor analysis for both scales of the questionnaire was first examined (see Appendix Tables A1 and A4). Bartlett's test of sphericity was significant for both scales, indicating the original correlation matrix was not an identity matrix. Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) levels were considered to be "good" for both scales according to Kaiser's (1975) criteria, indicating that the patterns of correlation between the items were fairly tight; therefore, factor analysis should result in distinct and reliable factors.

A separate factor analysis was performed on each of the two scales in the questionnaire, utilizing the maximum likelihood method of extraction and an Oblique rotation, Direct Oblimin (see Appendix Tables A2 and A3 for questionnaire items and their loadings). Based on the Eigenvalues over 1.0 rule, visual inspection of the scree plot, and interpretability, the following factors were identified in each scale (see Tables 2 and 3). Item loadings less than 0.3 have been excluded for clarity, except for Item 16, "I have trouble using the computer when I study," which was allowed to stay in the factor due to its conceptual match with the other items and Stevens' (1992) research showing that, with large samples over  $N = 300$ , item loadings under 0.3 can be considered statistically significant.

**Table 2.** Factor reliability of the opinions of Distance Learning Scale

Factors	Number of Items in Factor	Cronbach's Alpha	Variance Percentage Explained
Meeting Independent Study Challenges	6	.749	30.60
Ease of Student Interaction	3	.774	10.28
Course Clarity	2	.685	7.72
Ease of Teacher Interaction	3	.739	6.14
Ease of Computer Interaction	3	.451	5.74

**Table 3.** Factor reliability of the General Learning Preferences Scale

Factors	Number of Items in Factor	Cronbach's Alpha	Variance Percentage Explained
Preference for Course Clarity	4	.761	34.2
Preference for Social Interaction	4	.750	24.2

The exploratory factor analysis indicated that, in general, items tended to load together into the factors they were designed to measure. In the Opinions of Distance Learning Scale, one exception was the Student Autonomy variable, which was found to be too broadly defined. One Student Autonomy item did not load with any other factor and was thus omitted from the factor analysis, and another item loaded with the two Computer Interaction items. Two Student Autonomy items, however, did load together with items from other variables that concerned the challenges of independent study, specifically, difficulties with course clarity and isolation. Since students tended to disagree that these difficulties were a problem for them, the factor was given the name Meeting Independent Study Challenges. In the General Learning Preferences Scale, because of the small number of items, only two factors emerged: Preference for Course Clarity and Preference for Social Interaction.

## Student Satisfaction Results

**Research Question 1:** *In general, how satisfied were students with their learning in this online distance education program?*

The average mean of the two items designed to measure student Learning Satisfaction was 3.97, indicating that students were satisfied overall with their learning in this distance

learning program. It should be noted that none of the 422 students strongly disagreed with Item 10 (see Table 4).

**Table 4.** Student learning satisfaction item

Item	Number	Minimum	Maximum	Standard Deviation	Mean
Item 10	422	2	5	.757	4.01
Item 21 (reversed)	421	1	5	.885	3.93
Items 10 & 21	419	1.5	5	.695	3.97

*Research Question 2: To what extent was student learning satisfaction predicted by a regression model containing the questionnaire subscales, and the demographic variables?*

In order to answer this research question, a simultaneous multiple regression was performed to determine the relationship between: (1) factors (aggregating the variable scores for each item in the factor into subscales), (2) demographic variables, and (3) the two indicators of student satisfaction (Items 10 and 21). Five significant predictors of learning satisfaction were found (see Table 5).

**Table 5.** Significant predictors of Learning Satisfaction

Predictor Name	Student Satisfaction Item Number
Meeting Independent Study Challenges	Item 10 and Item 21
Ease of Computer Interaction	Item 10
Ease of Teacher Interaction	Item 10
Preference (-) for Social Interaction in Learning	Item 10
2006 (recent) entry	Item 21

### Multiple Regression Results - Item 10

Item 10 showed significant results for three of the opinions of distance learning subscales: Meeting Independent Study Challenges, Ease of Computer Interaction, and Ease of Teacher Interaction, and one of the General Learning Preference subscales, Preference for Social Interaction in Learning. Overall, the regression model was significantly different from the null model (i.e., no predictor model) ( $F(15, 298) = 11.81, p < .001$ ) (see Appendix Table A6). None of the demographic variables, however, were found to be statistically significant predictors of student learning satisfaction. This finding was consistent with Hiltz and Shea's (2005) observation that "demographic characteristics, such as age and gender, are weak predictors of success in ALNs" (asynchronous learning networks) compared to pedagogical factors (p. 154). Individual predictors are discussed below.

**Predictor (1) Meeting Independent Study Challenges** – Students who found it easy to persevere in the face of the challenges of independent study were more satisfied with their learning than those who did not ( $b = .273$ ,  $t(313) = 4.14$ ,  $p < .001$ ). This indicated that for every 1-unit increase in the Meeting the Challenges of Independent Study subscale, student learning satisfaction increased by .273 units, holding all other predictors constant. This was the strongest predictor of student satisfaction and the only significant predictor of learning satisfaction found with both learning satisfaction items. This subscale contains two items originally designed to measure student autonomy and, combined with the other items in this factor, points to the importance of maintaining perseverance in the face of distance learning challenges – supporting studies which found the personal quality of perseverance to be a success factor in distance learning (Osborn, 2001; Mielke, 1999).

**Predictor (2) Ease of Computer Interaction** – Students who found it easy to use computers were more satisfied with their learning than those who did not ( $b = .271$ ,  $t(313) = 4.26$ ,  $p < .001$ ). This indicated that for every 1-unit increase in the Ease of Computer Interaction subscale, student learning satisfaction increased by .222 units, holding all other predictors constant. This finding supports other studies (Miller, Rainer & Corley, 2003; Schrum & Hong, 2001) that found a positive relationship between student comfort with technology and student success and satisfaction in online courses.

**Predictor (3) Ease of Teacher Interaction** – Students who found it easy to interact with instructors were more satisfied with their learning than those who did not ( $b = .145$ ,  $t(313) = 2.39$ ,  $p = .017$ ). This indicated that for every 1-unit increase in the Teacher Interaction subscale, student learning satisfaction increased by .145 units, holding all other predictors constant. Of the seven subscales, this subscale had the second highest correlation with Item 10 ( $r = .455$ ). In fact, the questionnaire item that had the highest correlation with student satisfaction as measured by Item 10 ( $r = .425$ ) was Item 6: “*It is easy to ask my teachers questions about assignments.*” This finding supports studies (Chen & Willits, 1998; Fredericksen et al, 2000; Marks, Sibley & Arbaugh, 2005) that found interaction with the teacher to be an important predictor of perceived learning in distance learning programs.

**Predictor (4) Preference (-) for Social Interaction in Learning** – Students who did not prefer social interaction when learning were more satisfied with their learning than those who did ( $b = -.126$ ,  $t(313) = -2.36$ ,  $p < .019$ ). This indicated that for every 1-unit increase in the Preference for Social Interaction in Learning subscale, student learning satisfaction decreased by .126 units, holding all other predictors constant. This is consistent with the low mean finding of 2.45 for the Ease of Student-Interaction subscale, which was the only subscale mean lower than the neutral point of 3.0 found in this study (see Appendix Table A5.). Clearly, having a preference for an aspect of learning that is difficult to obtain in a particular learning context would lead to less satisfaction. This finding also supports other studies (Kelsey & D’souza, 2004; Swan, 2001) which found that student interaction did not play an important role in student satisfaction.

## Multiple Regression Results - Item 21

With the second item used to measure learning satisfaction, Item 21, the resulting regression model differed significantly from the null model (i.e., no predictor model) ( $F = (15,300) = 6.198$ ,  $p = .001$ ) (see Appendix Table A6). This item revealed a significant result for one of the Opinions of Distance Learning subscales, Meeting Independent Study

Challenges ( $b = .458$ ,  $t(315) = 5.54$ ,  $p < .001$ ), discussed above as *Predictor (1)* for Item 10. There was also a significant result for one of the demographic variables, Year of Entry.

**Predictor (5) Year of Entry - Fall 2006** – Being a Fall 2006 entrant, compared to three other groups – Spring 2006 entrants, 2005 entrants, and 2004 entrants – led to increases of .258 point on Item 21 after controlling all the other predictors ( $b=.258$ ,  $t(315)=2.04$ ,  $p = .042$ ). For Fall 2006 entrants, student learning satisfaction increased by .258 units, holding all other predictors constant, indicating there is a “honeymoon” period of increased learning satisfaction for the most recent entrants to this program.

## Qualitative Results

A separate qualitative analysis was performed on the 840 student responses to the three open-ended items used in the questionnaire. The strongest themes that emerged are described below (see Table 6).

**Table 6.** Strongest qualitative themes

<b>Advantages of Distance Learning</b>	<b>Difficulties of Distance Learning</b>	<b>General Learning Preferences</b>
1. The Importance of Personal Convenience (69.3% of responses in category)	1. Difficulties with Motivation and Time Management (32.2%)	1. Preference for Study Alone (23.2%)
	2. Difficulties with Teacher Interaction (19.2%)	
	3. Difficulties with Student Interaction (15.6%)	
	4. Difficulties with Course Materials (9.2%)	

### ***Theme 1 – The Importance of Personal Convenience***

The largest number of student responses (69.3%) regarding the advantages of distance learning concerned the convenience of being able to study at times and places of students' choosing. Responses such as these were common:

*“I can adjust study to my lifestyle and study at my own pace.”*

*“Because of work it is very difficult for me to attend school, so this school is very helpful.”*

*“It is convenient to study when you have a break from childrearing duties.”*

## ***Theme 2 – Difficulties with Motivation and Time Management***

The largest number of responses (32.7%) was in regard to the difficulties of distance learning, specifically, the difficulty of setting some kind of regular study schedule and having the motivation to maintain it. This complements Theme 1, as the Personal Convenience of choosing the time and place of study implies individual responsibility for making sure the study gets done. Many students reported difficulty setting a regular study schedule and having the motivation to maintain it. Responses such as these were common:

*“It is hard to stick to a regular schedule when work and everyday life interrupts.”*

*“It takes a strong motivation to stick to a study schedule, especially at home.”*

## ***Theme 3 – Difficulties with Teacher Interaction***

Also in regard to the difficulties of distance learning, a substantial number of responses (19.2%) concerned the difficulties of interacting with the teacher in an online program. Responses such as these were common:

*“When communicating with the teacher online a human element lacking.”*

*“It is difficult to communicate with the teachers. They are slow to answer my email.”*

## ***Theme 4 – Difficulties with Student Interaction***

A smaller number of responses (15.6%) in regard to difficulties of distance learning dealt with students' difficulties interacting with other students. Responses like these were common:

*“Making friends is difficult. When you attend a traditional school, you can meet people your own age. Via the Internet it is difficult to connect or feel an affinity with others.”*

*“If one can make a friend we can mutually raise the motivation.”*

Difficulties with social interaction were not only important in the affective realm; it was also difficult for many students to clarify understanding when course materials were difficult to understand. Responses like these were common:

*“Especially when problems come up with study, there is a lack of friends to discuss with”*

## ***Theme 5 – The Importance of Course Clarity***

Difficulties with the clarity of course materials were specifically mentioned in 9.6 percent of student responses, and underlined the importance of course clarity as a facilitator of

independent study. Many comments mentioned that difficulties understanding content lead to inertia and trouble maintaining a study schedule. For example, one student wrote:

*“It is difficult to be sure you are understanding the text, which causes uneasiness when studying alone. It becomes difficult to move forward with study.”*

### ***Theme 6 – Preference for Study Alone***

In regard to student general learning preferences (Item 31), the largest number of student responses concerned the preference for study alone, and 23 percent of students mentioned this idea in their responses. Responses such as this were common:

*“I prefer to study alone and quietly.”*

The idea of studying alone, however, was often combined with preferences for other modes of learning. For example:

*“First I like to read alone and try to understand as best as possible, then I like to check my understanding with my teacher.”*

## **Discussion**

In this section, the quantitative and qualitative results are converged and discussed. The first research question concerned the overall level of learning satisfaction, and the high level of learning satisfaction in the sample indicated that this university attracts students suited to the demands and opportunities presented by this learning context. These results differ from Kubota and Fujikawa's (2007) findings where traditional Japanese undergraduates taking an experimental online distance learning course were reticent to recommend the course to friends. The reason for this difference is not possible to determine; however, program characteristics, student age, motives to enter, and the fact that students in this online distance university self-selected the distance mode of study are all possible factors.

The second research question sought to determine the predictors of learning satisfaction, and three of the five predictors emerging from the quantitative analysis, emphasized the importance of personal factors internal to the learner for learning satisfaction in this educational context: (1) Meeting Independent Study Challenges stressed the personal ability to persevere in the face of distance learning challenges such as unclear content and isolation, (2) Ease of Computer Interaction stressed personal ability with computers, and (3) Preference for Social Interaction in Learning (which was negatively correlated with learning satisfaction) suggested a preference for independent learning. The importance of personal factors to learning satisfaction was supported by the qualitative results which found that three of the strongest themes – (1) The Importance of Personal Convenience, (2) Difficulties with Motivation and Time Management, and (3) The Preference for Studying Alone – also emphasized the importance of personal factors for students in this learning program. To a large extent, these results reflect the nature of the program and its demands for independent study.



The other important predictor of student learning satisfaction emerging from the quantitative analysis was Ease of Teacher Interaction. This was not surprising as studies have found interaction with the teacher to be important to learners in face-to-face classes (Chickering & Gamson, 1987), in distance learning contexts (Marks, Sibley & Arbaugh, 2005; Fredericksen et al., 2000; Chen & Willits, 1998) and in Japan where a teacher-centered approach to learning and appreciation of authority figures is common (Kubota & Fujikawa, 2007; Hadley & Hadley, 1996). Clearly, it is a challenge to provide large numbers of students with opportunities for interaction with the teacher at a distance. The learning system at this university, which allows for synchronous and asynchronous viewing of lectures as well as communication with the teacher via the Internet, is an attempt to meet student needs in a cost-effective manner. The qualitative results supported the importance of this predictor, as Difficulties with Teacher Interaction emerged as a strong theme in the analysis of student comments.

The findings for the Course Clarity were neutral in the prediction model; however, the qualitative data made it clear that Course Clarity was important to students because it facilitated independent study. Ease of Student Interaction was also neutral in the prediction model, yet the qualitative responses indicated that Student Interaction is a polarized issue, as some students clearly preferred to work independently of others, while others clearly wished for more interaction with other students in order to clarify understanding or reduce the sense of isolation. It should be noted that professors at this university do not typically require students to work together on projects or ask them to engage in online asynchronous threaded discussions as is common in other distance learning programs. It is interesting to consider whether greater personal experience with a “constructivist” mode of learning would convince students of the benefits of student interaction in learning. The qualitative responses, however, indicated students may need both encouragement to interact online and support in developing skills for interaction in a “low context” online environment where information about others’ age, gender, social status, and interests, are less salient.

### **Limitations and Recommendations for Further Study**

One limitation of this study was that it was a volunteer sample of students, and the results could only suggest the characteristics of the study population. In regard to questionnaire development, researchers’ access to students was limited due to privacy concerns, and although measures were taken to increase validity and reliability of the instrument, a more robust pilot process would have been preferable. In particular, further work will be necessary to improve the focus of items designed to measure Student Autonomy.

In regard to further study, the results suggest many similarities with adult learners from other countries however, to make definitive statements about cultural similarities or differences, it would be necessary to do a comparison study with learners from other countries.

### **Conclusions**

The results of this study indicated this online distance university differs from other undergraduate institutions in Japan, because it attracts predominantly older “non-traditional” learners who have often chosen to enroll because of convenience or because there are no other viable options due to physical distance from universities or work/

domestic responsibilities. The high level of student satisfaction in the sample indicated that this university attracts students better suited to the demands of this learning context.

The mode of instruction at this university follows a predominantly transmission model emphasizing independent study. This learning context, therefore, was more satisfying for independent, computer-competent learners who could persevere in the face of the challenges presented by this program, while being able to take advantage of the opportunities provided for interaction with the teacher. Opportunities for interaction with other students were available but not emphasized, and as some students indicated a preference for more social interaction when learning, this is an area where program development could take place. The study results suggest that “getting the mix right” for Japanese online distance learners must entail being careful to provide ample opportunities for interaction with the teacher, while assuming students have the necessary autonomy to study on their own, as long as course materials are clearly presented.

**Note:** The complete study including a review of research on Japanese learners can be found in the book *Japanese Online Distance Education: Learners' Perspectives*, by Eric Bray, VDM Publishing, May 2008.

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## Appendices

**Table A1.** Obliquely rotated component loadings of items in Opinions of Distance Learning Scale

Questionnaire Items	Factor One (MC)	Factor Two (SI)	Factor Three (CC)	Factor Four (TI)	Factor Five (CI)
<b>N = 368 (excluded cases listwise)</b>					
18. It is difficult to get motivated to do my assignments. (R)	-.736				
19. It is difficult to understand the goals of my courses. (R)	-.701				
14. It is difficult to understand how to do my assignments. (R)	-.573				
20. I feel isolated from other students. (R)	-.495				
12. I have trouble finding time to do assignments. (R)	-.406				
13. It takes a long time to get comments on assignments back from teachers (R)	-.354				
9. It is easy to get to know other students.		.788			
4. It is easy to exchange opinions with other students about the course.		.704			
15. It is difficult to develop relationships with other students. (R)		-.663			

3. Course assignments are easy to understand.	.536	
	.384	
7. Courses are well-organized.		-.684
6. It is easy to ask the teacher questions about assignments.		-.604
2. It is easy to get guidance from my teacher.		
	.396	
17. It is difficult to feel close to my teacher. (R)		
5. It is good I can study using the computer.		.592
		.400
8. It is good I can make decisions about what I learn.		
16. I have trouble using the computer when I study. (R)		-.258

Note. MC = Meeting Independent Study Challenges, SI = Ease of Student Interaction, CC = Course Clarity, TI = Ease of Teacher Interaction & CI = Ease of Computer Interaction, (R = reversed scoring)

**Table A2.** Obliquely rotated component loadings of the items in the General Learning Preferences Scale

Questionnaire Items	Factor 1 PCC	Factor 2 PSI
<b>N = 401 (Excluded cases listwise)</b>		
30. I prefer a course where the assignments are clear.	.838	
26. It suits me to study in a course where the course materials are easy to understand.	.718	
28. I prefer to be able to make decisions about what I learn		
	.549	
29. I prefer to get guidance from my teacher when I learn.		

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	.402
24. It suits me to communicate with other students when I study.	
27. I prefer to interact with other students when I learn.	.794
23. It suits me to study independently. (R)	
25. It suits me to communicate with my teacher when I study.	.651
	-.639
	.531

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*Note. PCC = Preference for Course Clarity, PSI = Preferences for Social Interaction, (R = reversed scoring)*

**Table A3.** *KMO and Bartlett’s Test for Suitability for Factor Analysis*

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<b>Tests of Suitability for Factor Analysis</b>					
Questionnaire Scales	Bartlett’s Test of Sphericity	Kaiser-Meyer-Okin Measure of Sampling Adequacy (KMO)	Approx. Chi-Square	df	Sig.
Opinions of Distance Learning Scale	.862	2020.5		153	<.001
General Learning Preferences Scale	.735	823.9		28	<.001

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**Table A4.** Factor Correlation Matrix

Correlations Between Factor Subscales								
Subscales		MC	SI	CC	TI	CI	PCC	PSI
MC	Pearson	1	.334**	.441**	.543**	.374**	-.065	-
	Correlation							.225**
Meeting Challenges of Distance Learning	Sig. (2-tailed)	.	.000	.000	.000	.000	.200	.000
	N	406	394	398	394	394	396	397
SI	Pearson	.334**	1	.393**	.503**	.136**	-.128*	-.080
	Correlation							
Ease of Student Interaction	Sig. (2-tailed)	.000	.	.000	.000	.007	.011	.110
	N	394	409	403	397	397	397	400
CC	Pearson	.441**	.393**	1	.580**	.373**	.081	-.070
	Correlation							
Course Clarity	Sig. (2-tailed)	.000	.000	.	.000	.000	.103	.158
	N	398	403	414	402	402	401	406
TI	Pearson	.543**	.503**	.580**	1	.380**	.009	-
	Correlation							.130**
Ease of Teacher Interaction	Sig. (2-tailed)	.000	.000	.000	.	.000	.860	.009
	N	394	397	402	410	397	399	399
CI	Pearson	.374**	.136**	.373**	.380**	1	.163**	-.017
	Correlation							
Ease of Computer Interaction	Sig. (2-tailed)	.000	.007	.000	.000	.	.001	.739
	N	394	397	402	397	409	397	401
PCC	Pearson	-.065	-.128*	.081	.009	.163**	1	.188**
	Correlation							
Preference for Course Clarity	Sig. (2-tailed)	.200	.011	.103	.860	.001	.	.000
	N	396	397	401	399	397	411	401
PSI	Pearson	-	-.080	-.070	-	-.017	.188**	1
	Correlation	.225**			.130**			
Preference for Social Interaction in Learning	Sig. (2-tailed)	.000	.110	.158	.009	.739	.000	.
	N	397	400	406	399	401	401	413

Note. \*\* = Correlation is significant at the 0.01 level (2-tailed).

\* = Correlation is significant at the 0.05 level (2-tailed)



**Table A5.** Descriptive data – subscale means and standard deviation

	<b>N</b>	<b>SD</b>	<b>Mean</b>
<b>Subscales</b>			
<i>Distance Learning Opinions</i>			
<i>Subscales</i>			
Meeting Independent Study Challenges	406	.662	3.30
Ease of Student Interaction	409	.780	2.45
Course Clarity	414	.730	3.30
Ease of Teacher Interaction	410	.791	3.16
Ease of Computer Interaction	409	.604	4.03
<i>General Learning Preferences</i>			
<i>Subscales</i>			
Preferences for Course Clarity	411	.568	3.88
Preferences Social Interaction	413	.671	3.11

**Table A6.** Multiple regression – coefficients (Item 10)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.10	.386		2.87	.004
	Motivation Challenges	.273	.066	.244	4.14	.000
	Student Interaction	.007	.050	.074	1.34	.181
	Course Clarity	.009	.061	.089	1.45	.148
	Teacher Interaction	.145	.061	.154	2.39	.017
	Computer Interaction	.271	.064	.222	4.26	.000
	Course Clarity Prefs	.007	.062	.054	1.09	.279
	Social Interaction	-.126	.054	-.114	-2.36	.019
	Prefs Faculty	.003	.084	.019	.355	.723
	Gender	.006	.079	.037	.755	.451
	Year2006sp	.006	.095	.039	.646	.519
	Year2005	-.008	.102	-.050	-.802	.423
	Year2004	.006	.113	.034	.523	.601
	Status	-.009	.081	-.063	-1.17	.244
	Previous Experience	.007	.068	.047	.997	.319
	Age	.003	.032	.040	.818	.414

Note. A simultaneous method of entry was used.  $R$  Squared = .373

**Table A7.** Multiple regression coefficients (Item 21)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.868	.517		1.679	.094
	Motivation Challenges Student Interaction Course Clarity Teacher Interaction Computer Interaction Course Clarity Prefs Social Interaction Prefs Faculty Gender Year2006sp Year2005 Year2004 Status Previous Experience Age	.485 .003 -.003 .005 .160 .007 .007 .109 .006 .258 .008 .291 -.004 -.006 .006	.087 .067 .080 .081 .084 .082 .071 .112 .105 .126 .134 .150 .107 .090 .005	.361 .028 -.028 .045 .109 .045 .001 .057 .032 .135 .041 .138 -.025 -.032 .073	5.538 .460 -.415 .640 1.908 .828 .010 .976 .593 2.042 .611 1.949 -.417 -.614 1.342	.000 .646 .679 .522 .057 .408 .992 .330 .553 .042 .542 .052 .677 .539 .181

Note. A simultaneous method of entry was used.  $R$  Squared = .237



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# **Beyond the Theoretical Impasse: Extending the applications of Transactional Distance Theory**

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## **Abstract**

The premise of this article is that the Transactional Distance Theory (TDT) should be accepted as a global theory for the further development of distance education. Despite the fact that a transactional approach seems to be consciously or unconsciously adopted by theorists and practitioners alike, the reluctance to recognise it as a global theory has plunged distance education into a theoretical impasse from whence there has not been much development. It is argued that the TDT can have applications along all the supply chain of the distance education enterprise: it can explicate and ensure the sustainability of quality distance education in a technology-driven world, and; encapsulate the national concerns for policy development. TDT is seen as a useful instrument that should effectively inform institutional as well as national development.

**Keywords:** Transactional Distance Theory; distance education

## **Introduction**

The development of theory in distance education is seen as crucial for its sustainability. Since the 1950s, there have been attempts to theorise distance education activities, and to explain underlying initiatives and endeavours (Black, 2007). Wedemeyer (1961, cited in Garrison, 2000) introduced the concept of independent study or learning as opposed to correspondence education.

Ever since, theory has been in ebullition, with various emerging tendencies. It has long been argued (for example Moore, 1993; Amundsen, 1993; Moore & Kearsley, 1996; 2005; Garrison, 2000; Saba, 2003, Moore, 2007) that there needs to be a global, comprehensive theory that can explicate all activities pertaining to distance education. While Moore has long claimed that the Transactional Distance Theory (TDT) is one such theory (Moore & Kearsley, 1996; 2005; Moore, 2007), there appears to be hesitation over accepting it as such, despite the fact that a transactional approach seems to be consciously or unconsciously adopted by theorists and practitioners alike.

This apparent reluctance to hail the Transactional Distance Theory as a global theory has plunged distance education into a theoretical impasse from whence there has not been much development. The emergence of two theoretical synergies has been noted (Saba, 2003, p. 4) as has the need to develop a third and more comprehensive synergy.

This research paper adopts the view that the theoretical impasse can be crossed with the recognition of Moore's Transactional Distance Theory as the global theory that can explicate and

ensure the sustainability of distance education in a technology-driven world. It further analyses its possible applications beyond simply the educational experience to encompass more general concerns like quality assurance and policy development. It is thus proposed that the Transactional Distance Theory be accepted as a global theory.

### **About Theoretical Synergies**

In their analyses of theoretical development in distance education, Saba (2003) and Garrison (2000) report the evolution of synergies and syntheses respectively. Thus Garrison argues that there has been a marked shift of a synthesis which reflected early preoccupations with organizational and structural constraints to a synthesis which carries transactional concerns related to teaching and learning. In a similar vein, Saba reports two main conceptual synergies whereby one with Holmberg, Wedemeyer and Moore, which places the learner at the center of the education process and makes the centrality of the learner a distinguishing feature the distance education; and another synergy presented by Peters, Garrison and John Anderson which is primarily concerned with structural issues concerning how the field is organized and how it runs without losing the centrality of the learner.

Concerned theorists have compiled all existing theory in one publication that has since become a noted reference (Keegan, 1993). Among all the theories developed by Moore, Peters, Holmberg, Keegan, and Garrison et al. (cited in Amundsen, 1993; see Table 1), it appears that the one developed respectively by Moore has not only stood the test of time but has been extended upon and has even seen practical applications (Saba, 2003). These have also been extensively documented by Moore (2007). Briefly, this claim, which will be further discussed, can be sustained by the about-face made by theorists like Holmberg who ultimately moved from his self-proclaimed as unfortunately and regretfully mistaken as authoritarian (Holmberg, 2003; 2007) guided didactic conversation to a new approach now known as the teaching-learning conversation which bears strong resemblance to Moore's idea of educational transaction. Earlier, Garrison (2000) had confirmed the importance of transactional issues in his discussion regarding the shift from structural concerns to transactional ones, and even reported how the plethora of above-named theorists had aligned themselves with Moore's transactional perspective. While distance education gained more amplitude, there seems to have been a singular divorce between theoretical development and practical development. This was compounded with the ushering of the World Wide Web in this scenario, whereby technology has received more attention than distance education itself; as well as the prevailing conceptual confusion around distance education (Moore, 2007, pp. ix-x; 2007a, p.58). As a result, there appears to be a complete misunderstanding regarding what constitutes the Transactional Distance Theory and its possible applications; research is carried out in an atheoretical manner and; finally, an impasse regarding distance education theory which has not developed much beyond Saba's incrustation of the systems approach in the Transactional Distance Theory (Saba, 1988; Saba & Shearer, 1994 cited in Moore & Kearsley, 1996; Saba, 2003; Saba, 2008). Garrison (2000) argues that "whether the leaders of [distance education] initiatives are the technically literate or the politically powerful, they generally lack a coherent understanding of distance education practice" (p. 1). This leads to a rift between program developers, who can be called distance education purists and those who are educational technologists, without being necessarily versed in distance education with its full range of available opportunities to achieve educational outcomes.

This confusion appears to have arisen in the wake of a paradigmatic shift from the organisational synergy to the transactional synergy. Saba (2003) and Garrison (2000) have noted that the concern of distance education practitioners had been initially with putting in place logistics to

widen access and decrease geographical distance. This first synergy pertained to organisational issues. Gradually, the focus shifted to the teaching and learning activity as a meaningful one, and energies were channelled towards making this experience at least as good as face-to-face education. Eventually, there appeared to be no significant difference between distance education and face-to-face education (Saba, 2003, pp. 6, 18). With the advent of technology and the focus on transaction, the question remains posed: “the ultimate theoretical challenge of any field of practice is to achieve a synthesis of perspectives and theories (i.e., global theory)” (Garrison, 2000, p.10). What, therefore, can this theory be? What are the concepts and constructs that can be used to explicate the distance education activities? What is it able to explicate? This implies that a third synergy is vital and should help us go beyond the theoretical impasse. It is proposed that the Transactional Distance Theory be taken as a global theory for the following reasons: the current need for a global theory is still recognised thereby suggesting a vacuum that has to be filled; it carries elements that are inherent in all the other theories developed so far while the converse cannot be asserted; most earlier theorists are now recognising the transactional nature of distance education and are modifying their own earlier propositions in terms that reflect aspects of the TDT. To reach a sustainable answer to the questions posed and to justify the emergence of a third synergy and the recognition of the TDT as the global theory, a review of theoretical development in distance education is first necessary.

## **The Development of Distance Education Theory**

An overview of distance education theory demonstrates that during its earlier stages, most distance education theorists have adopted a holistic approach to the development of theory (Saba, 2003). Their conceptualization addresses overarching issues such as how to define its characteristics and how to distinguish distance education from other forms of education. As various theorists have contributed their own theoretical building blocks, there has been an important debate over the ‘appropriate’ theory.

The last three decades have witnessed the formalisation of distance education as a discipline. Several theoretical frameworks have been developed in an attempt to encompass and explain the activities in distance education. As theorists have tried to position their thinking, there seems to have been a lot of ‘noise’ among scholars around what is the most appropriate or most comprehensive theory to explicate the activities within distance education. This ‘noisemaking’ has been fruitful – it has allowed the emergence of a series of thinking as demonstrated in Table 1.

The following table has been adapted from Amundsen (1993) to summarise some of the most discussed theories on distance education.

**Table 1.** A comparison of theoretical perspectives (adapted from Amundsen, 1993, p. 70)

<i>Framework</i>	<i>Central concepts</i>	<i>Primary focus</i>	<i>Apparent influence</i>
Peters- The Industrial model	Industrial Post- industrial	Match between societal principles and values	Cultural sociology
Moore- Transactional distance theory	Transactional distance (dialogue, structure) Leamer autonomy]	Perceived needs and desires of the adult learner	Independent study
Holmberg- Theory of teaching in distance education	Leamer autonomy, Non-contiguous communication Guided didactic conversation	Promotion of learning through personal and conversational methods	Humanist approach to education
Keegan- Theory of reintegration of the teaching and learning acts	Reintegration of teaching and learning acts	Recreation of interpersonal components of face to face teaching	Framework of traditional pedagogy
Garrison (Shale, Baynton) – A theory of communication and leamer control	Educational transaction , Leamer control, Communication	Facilitation of the educational transaction	Communication Theory – Principles of adult education

Despite the similarities and differences in the theories described in Table 1, however, the author of this paper is of the view that the most comprehensive one is, indeed, the one developed by Moore (1993). To use a scientific metaphor, it is a global theory that carries the stem cells of other theories. The importance and difference with the Transactional Distance Theory, however, is that it can encompass both organisational and transactional issues without losing sight of the learner, the institution, and the nation altogether. This can be proved by the way the thinking of all the other authors seem to be redirecting their work towards Moore’s thinking – that is, the organisational synergy is moving firmly towards the transactional one.

For instance, Peters (1993) developed the industrial model whereby distance education carried compartmentalised activities that could be optimised if a division of labour approach was utilised. Subsequently, he has revised the industrial approach to distance education to include transactional elements and to think more in pedagogical rather than industrial terms. While distance education is, according to him “a typical product of industrial society” (Peters, 1993, p. 57), the post-industrial era “calls for the design of new models of distance education [that will have to] rely on self-directing and self-controlling – that is, on students becoming autonomous”. In his revised position, he “extends independent forms of learning at a distance (i.e., self-learning and tele-learning) with the inclusion of social intercourse” (Peters cited in Garrison, 2000, p.7). Indeed, Peters later argues that the “industrial approach to distance education needs to be seriously examined” (Peters cited in Garrison, 2003, p. 164). In addition, he believes that “for students to be autonomous, they have to be “meta-cognitively, motivationally and behaviourally active participants in their own learning” (Peters cited in Garrison, 2003, p.164).

Another noteworthy author, Holmberg has also revised his position to include a more comprehensive framework. Holmberg’s core view was that distance education is more effective when it is carried out through a “guided didactic conversation” (Holmberg, 1989, p. 43). In essence, he argues that distance education is a “friendly conversation [fostered by] well-

developed self-instructional materials [that carry] feelings of personal relation . . . intellectual pleasure [and] study motivation” (p. 43). Garrison argues that “despite the fact that conversation was the defining characteristic in Holmberg’s theory of distance education, this theory was directed to the pre-produced course package and clearly within the industrial paradigm” (2000, p. 8). Indeed, his earlier focus which was on “the inter-personalisation of the teaching process at a distance” and carried similar elements to Moore with regard to learner autonomy as the ideal and flexibility in terms of negotiable entry and exit points and assignment deadlines [which appear to be a precursor of *open and distance education*] was later modified to include a more comprehensive framework (Amundsen, 1993, p. 65). This new framework included issues like “feelings of belonging and cooperation” (Holmberg, 1989, cited in Amundsen, 1993, p. 66) or empathy (Holmberg, 2003; 2007). This theory carries elements of Moore’s theory at its inception and when modified included an increasing number of elements inherent in the TDT.

Keegan (1993), on the other hand, believes that distance education should be carried out along lines that replicate the face-to-face educational transaction. He argues that there is need to reconstruct the moment in which the teaching-learning interaction occurs (Keegan, 1993). According to Keegan, “a theoretical structure for distance education focusing on the reintegration of the teaching acts by which learning is linked to learning materials may go some way to compensating for the location of the students, causing the lack of eye-to-eye contact which is so important in education” (p. 131). This view diverges from Moore’s and Holmberg’s views that separation is an advantage and a challenge to the autonomous learner (Amundsen, 1993). Keegan’s view is also important because the recreation of the face-to-face educational transaction is, indeed, considered in both Holmberg’s and Moore’s theory. The only difference is that the two latter theorists place more trust in the learner’s ability to take responsibility which is not the case with Keegan. However, major aspects of this theory as well are found within the Transactional Distance Theory.

Garrison’s theory of communication and learner control also contains elements that can be assimilated to the Transactional Distance Theory. He argues that “the educational transaction is ‘based upon seeking understanding and knowledge through dialogue and debate’ . . . and, therefore necessitates two-way communication between teacher and learner (Garrison, 1989, cited in Amundsen, 1993, p. 67). This two-way communication should be supported by technology and managed in a manner that control over the transaction is negotiated between the teacher and the student. The concept of learner/ teacher control is thus proposed partly in lieu of the concept of independence or autonomy used by both Holmberg and Moore.

Eleven years later, Garrison still deplores the lack of global theory: “The ultimate challenge of any field of practice is to achieve a synthesis of perspectives and theories (i.e., global theory) that reflects the complete continuum and is inclusive of a full range of practices” (Garrison, 2000, p. 12); three years later, he agrees that his own position regarding the self-directed learner or the autonomous learner is more aligned with the Transactional Distance Theory. By arguing that “the complementary issues of control and responsibility for students and teachers must be considered in any conceptualisation of self-directed learning if it is to have any relevance for distance education or any educational experience” (Garrison, 2003, p. 163), Garrison aligns his views with those of Moore as expressed in the Transactional Distance Theory whereby through the autonomy dimension, transactional distance goes beyond control by raising the importance of cognitive, meta-cognitive, and learner responsibility issues. Despite this alignment, Garrison still remains tangential to the Transactional Distance Theory because he uses one particular concept – self-directedness – as his springboard. Nonetheless, this approach ushers in concepts like cognitive, meta-cognitive (including control and/ or self-directedness and/ or responsibility) and



affective (including socio-economic issues). These are the essential organising principles that are defined by Deschênes and his collaborators in an article that analysed the different aspects of learning activities (Deschênes Bourdages, Michaud, & Lebel, 1992). These aspects are further developed and synthesised by Deschênes in several of his writings (Deschênes, 2006; Deschênes & Maltais 2006) and emerge as three main strands that are inherent in the development of a third synergy. Despite the finality in Moore's tone when he explicates the Transactional Distance Theory as a "global theory" that has a place for both a highly mechanical system (as postulated by Peters) and a more learner-centered interactive relationship with a tutor, as well as "every variation of these perspectives" (Moore & Kearsley, 1996, p.199), Garrison (2000) notes the need to search for an appropriate theoretical framework, which he believes is not "a realistic expectation for distance education theory in the near term" (p.12). As Saba (2003) notes, from the two synergies that had emerged there is now a renewed synergy that increasingly reflects a convergence towards Moore's Transactional Distance Theory. This third synergy will thus be made up of a combination of organisational and pedagogical pillars supported by cognitive, meta-cognitive, and affective strands, braided together in the global theory niche. It is now fitting to consider the scenario in which much distance education research has been carried out (that is without a solid theoretical grounding) and the resulting implications.

### **Theory or Atheory?**

From the literature it is indicated that much research that is published and much practical work that is done in the name of distance education does not appear to be grounded in any particular distance education theory. While many organizations offer some form of distance education, their related activities cannot be explicated in terms of the constructs of any distance education theory. The study carried out by Lee, Driscoll, and Nelson (2004) and the views adopted by Gibson (2003), and Glickman (2006), all point to the atheoretical nature of most research carried out by distance education practitioners. Lee and colleagues (2004, p.237) are explicit in their content analysis of four prominent research journals; about the fact that research in distance education rarely reflects educational and psychological theory; that there is a paucity of theory-based studies; that researchers do not appear concerned with issues of validity and reliability (especially with regards to quantitative studies) and; the fact that "new research methodology and paradigms are needed to advance distance education research" (Lee, Driscoll & Nelson, 2004).

In addition, Gibson (2003) argues that "many articles on learners and learning appear to be without theoretical or conceptual foundation raising an interesting set of issues and questions" (p. 147). Similarly, Glikman asserts that most research is atheoretical, and thus opens up the possibility of technology superseding pedagogy at the latter's expense (Glikman, 2006 in Deschênes & Maltais, 2006; Moore cited in Bernath & Vidal, 2007).

Moore and Kearsley have long forecasted this scenario by recognising as far back as 1996, that "while quite a lot of research has been done on the effectiveness of media, course design techniques and instruction, very little has been done to find out what are effective policies or what are the effective mechanisms for making policy at either national, state, or institutional level. Of course policies are made and are described in reports and other documents, but they are not often subjected to academic analysis, and the process by which they are carried out is even less scrutinized" (Moore & Kearsley, 1996, p. 74). The concern raised therefore appears to be the fact that without a theoretical context, the effectiveness of a lot of distance education research may be called into question.

Theory becomes important because it allows the exploration of more sophisticated issues that allow for more predictable generalisations. In fact, as Moore and Kearsley (1996) argue further,

“while the theoretical frameworks do address certain of the variables, many are not covered by any existing theories... [and] there are no theories that deal with the interactions or interrelationships in terms of the effectiveness of distance learning programs” (p.76). This suggests that revisiting the TDT can charter a map (Bernath & Vidal, 2007) that helps open up new vistas for its application. Before we explore this lead further, it is important to discuss the TDT first.

## **Transactional Distance Theory: What about it?**

The Transactional Distance Theory is concerned with independent study and highlights the shared responsibility of the teaching/ learning enterprise with the independence of the learner seen as the most important and desired outcome (Moore, 1993; Deschênes & Maltais, 2006). This outcome is the result of shared negotiation through dialog and structure between teacher and learner.

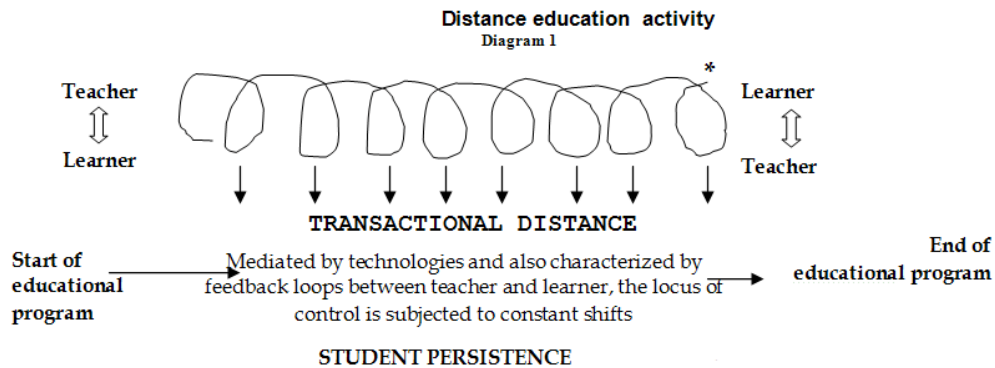
On the one hand, structure and dialog can “describe the extent to which course components can accommodate or be responsive to each learner’s individual needs” (Moore & Kearsley, 1996, p.200). This requires a high range of thinking skills from the learner including thinking about the learning activity – or meta-cognition. Meta-cognition or the thinking about and organising one’s learning, is seen to be a critical thinking skill that resonates with reflective practice. Structure and pedagogical dialog help organise the teachers’ and learners’ reflective practices and enhances student participation (Deschênes & Maltais, 2006, pp.55-56). There is an inverse relationship between structure and dialog – that is the more structured an educational program the lesser space is provided for dialog or interaction and negotiations of meaning during the teaching/ learning process, and the greater the distance between the teacher and learner. The greater the transactional distance, which is viewed as a space for potential misunderstanding, the more responsibility is required of the student (Moore & Kearsley, 1996, p. 204).

TDT can also be used to map the transition from the behavioural approach to learning, especially for the novice learner who probably requires more structure with objectivist instruction at the beginning of an educational program versus the experienced and more mature learner who may require less structure, possibly within more constructivist patterns of teaching/ learning, (Saba, 2003). The varying use of structure and dialog can be applicable to all generations of distance education – generations being especially characterised by the use of particular media ranging from the first print-based correspondence instruction through to the use of radio and television recorded programs; to the use of satellite and telephony and; eventually to the World Wide Web for online or email-based instruction.

Preferring a constructivist approach to a behaviourist stance Moore (1972) focused on the concept of autonomous learner as responsible for decreasing transactional distance given their position in the structure/ dialog dichotomy. This idea is echoed by Keegan (1993) who argues that towards the end of the educational enterprise “there is little distinction between teacher and taught. They are both participating in the shared experience of exploring a common world” (p. 126). In addition, Keegan sees the inter-subjectivity of teacher and learner in the educational transaction by the way that they share control and responsibility of the two-way communications in distance education. Learning happens through mutual sharing and negotiations of meaning between teacher and learner in such a manner that the locus of control shifts from one to the other constantly through the feedback process, which Saba (2003; 2007) calls the “feedback loop.”

In response to Garrison (2000) that the creation of a visual model would go a long way towards clarifying the structural relationships among these concepts, the following is a proposed visual representation. Transactional distance is illustrated in Figure 1.

**Figure 1.** Distance education activity



Adapted from Saba (2003; 2007)

Figure 1 demonstrates how part(s) of the theories or perspectives held by the theorists (described in Table 1) can be found within the Transactional Distance Theory, which contains all elements – including educational transaction mediated by technologies between teacher and learner – within a relationship of mutual respect that rests on mutually negotiated balance of control. As the locus of control shifts, and the learner persists along the educational program, the ultimate result is the creation of the *persisting* autonomous learner.

At the start of the learning enterprise, there is a hypothetical teacher in a mutually responsible sharing relationship with a hypothetical learner. Between them is the transactional distance, which is a space for potential misunderstanding. The teaching/ learning transaction happens in an environment that is characterised by a separation of teachers and learners, and special procedures are required to remove this distance. It is the psychological and communication space that characterises transactional distance, (Moore & Kearsley, 1996; 2005). Mediated by technologies, an inverse relationship between structure and dialog will determine the transactional distance; that is the more autonomous the learner, the less structure is required – this gives rise to more dialog or interaction as meanings are constantly negotiated in the educational enterprise.

As the student persists from the start to the end of the educational program, the locus of control may change from the teacher to the learner, thus adding to the ‘healthiness’ of the exchange (Deschênes & Maltais, 2006). Locus of control is a concept that may demand further research – it may emerge as a very strong predictor of persistence because it is indicative of a very personal will to complete an educational program. Learners with an internal locus of control defined as those who hold the belief that the outcome of a situation is contingent on their own behaviour, appear to have higher rates of completion (Dille & Mezack cited in Parker, 1999; 2003). This is seen to be a determinant of self-efficacy and to have strong links with self-directed learning.

To simplify the interrelationships between the constructs inherent in the TDT, Saba developed the idea of the feedback loop to demonstrate the inverse relationship between dialog and structure. This has been incorporated in Figures 1 and 2 respectively. Achievement of the educational goals is demonstrated by the use of the feedback loop that indicates the “cybernetic relationship between instructor and learner” (Saba, 2003, p. 11) and helps reconcile seemingly opposite concepts: a “negative feedback loop provides a mechanism for determining how much transactional distance is desired and required at each point in time” (Saba, 2003, p. 11). Feedback loops operate to reduce this transactional distance such that there is more ‘transaction’ and less ‘distance’ in a mutually responsible, respectful (Garrison, 1993, p.13) and *interactive* or rather *dialogic* sharing relationship. Garrison’s comprehensive model (1997) and his concept of control (1993) included notions like control, critical reflection, and responsibility as the three dimensions of self-direction. Gibson and Lee (2003) assert that Garrison’s model suggests that interaction also “influences self-direction on the assumption of shared control based on dynamic communication among the teacher, learners and the curriculum. Finally, the concept of responsibility was defined as the students’ active attitude or willingness related to learning” (Gibson & Lee, 2003, p. 174).

Thus the transactional distance theory suggests that “there are two critical underlying variables – structure and dialog – and that these are in relationship to learner autonomy. Thus as a pedagogical theory, this theory explains the nature of programs and courses as well as how the teachers and learners behave in their interactions” (Moore & Kearsley, 1996). In support to this view, Saba (2003) argues that accountability for interaction is of utmost importance in a systems approach. This helps benchmark the quality of an educational program in terms of its final effectiveness – the learner has learnt meaningfully (Deschênes & Maltais, 2006). Regarding the application to distance education based on a range of technologies in the spectrum available across the generations, Moore and Kearsley (1996) argue that different technologies can support the use of a variety of media. For example, “certain books, audiotapes, or videoconferences are different in the ways they support varying degrees of structure in educational programs, different degrees of dialog between teachers and learners and among learners as well as differing degrees of self-directedness of the learners” (p. 10).

The above discussion further validates the use of the Transactional Distance Theory which is intended to be global and descriptive in what Moore calls “molar theory” thereby defining it as a matrix within which all other theories can find root and can help address the different systems or components of distance education (Moore & Kearsley, 1996). It establishes the ground for the development of other molecular theories - meaning theory as identified by the following three clusters of variables – dialogue, structure, and learner autonomy – that can then be subsumed under the various components or subsystems of distance education.

This theory is constantly enlisted to analyse issues around the concept of distance education, especially in the Saba and Shearer (cited in Saba, 2003; 2007) study where the first visual representation of the Transactional Distance Theory was made. Finally, this theory has affirmed a new identity for distance education beyond its initially understood concept of geography to include that of pedagogy, andragogy, and psychography. Successful distance teaching will depend on the range of relevant facilities and procedures in the exchange between the distance learner and the teacher to reduce the transactional distance.

## Towards a New Synergy

When Moore’s TDT which carries dialog and structure as its main variables is put in dialog with Deschênes’ organising strands of student persistence this creates a third synthesis as will be now explained. It is, indeed, towards this synthesis that most distance education theorists are converging. The new synergy appears to validate TDT as a global theory because it is now demonstrably comprehensive of organisational and pedagogical issues; has possible implications for quality and policy that have to be explored. The systemic approach that subsumed the development of the TDT is also worthy of exploration to identify the possible extended applicability of this theory.

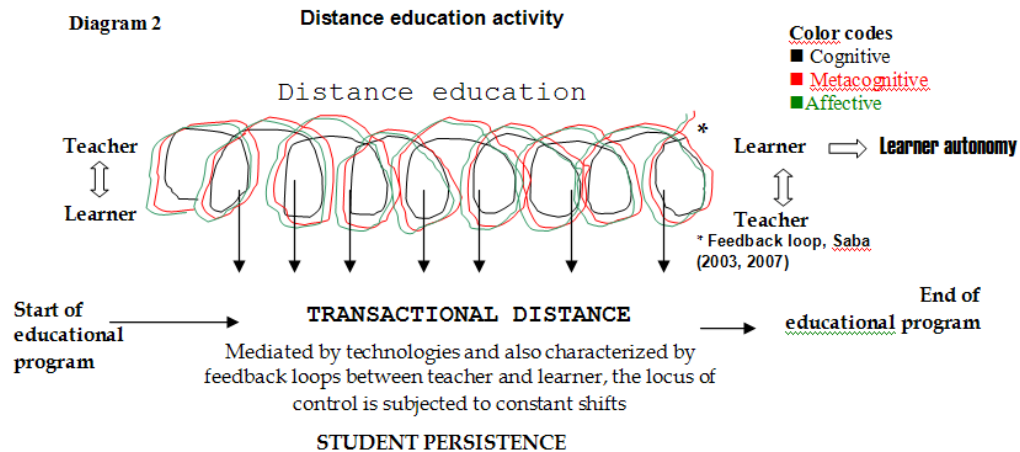
At about the same time Moore developed the TDT (1993), another scholar, Henri (1992) introduced a framework that was aimed at helping distance education practitioners understand and explain the teaching and learning processes. Her model carried elements like participation, interaction, social, cognitive, and meta-cognitive. These were further refined by Deschênes (Deschênes *et al*, 1992; Deschênes, 2006; Deschênes & Maltais 2006) who synthesised the above elements into three strands of student persistence: the cognitive, the meta-cognitive, and the affective. The different elements that affect learner persistence have been organised in three respective strands that find echoes in the respective components of TDT. A fourth strand – socio-economic – has been subsumed under the affective and meta-cognitive strands respectively. This is best illustrated in Table 2.

**Table 2.** Braiding Moore’s TDT and Deschênes’ organising strands of student persistence

Transactional Distance Theory (TDT)	Structure	Dialog	Independent Study
Organising strands of Student Persistence	Cognitive	Affective	Meta-cognitive
		<i>Socio-economic strand</i>	

The third synergy then consists of transactional and organisational issues that are supported by cognitive, affective, and meta-cognitive issues. Braided and consolidated within the TDT, the above strands will help organise our understanding regarding what best promotes student persistence. The desirable end result of this transaction is learner autonomy – that is a learner who has been able to persist through the transactional distance and has successfully merged the cognitive with the affective and meta-cognitive strands to their best negotiated requirements and who is now a fully autonomous learner. The feedback loop *has been redesigned to incorporate the three strands proposed by Deschênes* (Deschênes *et al*, 1992; Deschênes, 2006; Deschênes & Maltais 2006) and is demonstrated by the colour coding.

Figure 2. Distance education activity



TDT is concerned with the psychographic view of the learner who is expected to share responsibility for his or her own learning processes. Learners thus assume much importance in the teaching/ learning transaction. The nature of the learner, especially the potential to undertake autonomous learning, can be expected to have an important effect on transactional distance in an educational program. TDT, therefore, is as concerned with geographical distance as it is with psychological and social distance; and thus with cognitive, meta-cognitive, socio-economic, and affective issues. The dialog between Moore’s and Deschênes’ theories indicate the development of a third synergy whose applications beyond simply teaching and learning should be explored. This is further discussed in the next section.

### What Answers Can be Provided by Transactional Distance Theory?

In the light of the above discussion, Transactional Distance Theory appears to be able to explicate organisational, pedagogical, and even policy related issues. The fact that nearly two decades after its development, most theorists are converging towards TDT, and moreover, their own individual theories carry elements of the TDT, appears to justify the need to explore this theory as a global one that can sustain future developments in distance education. At this juncture, it is necessary to discuss the systems perspective that subsumes the Transactional Distance Theory. Indeed, approaching distance education through a systemic view which subdivides all the components of distance into various groups facilitates all types of interventions, including academic and the evaluative, such that distance education as a discipline can be said to belong to a culture of continuous improvement.

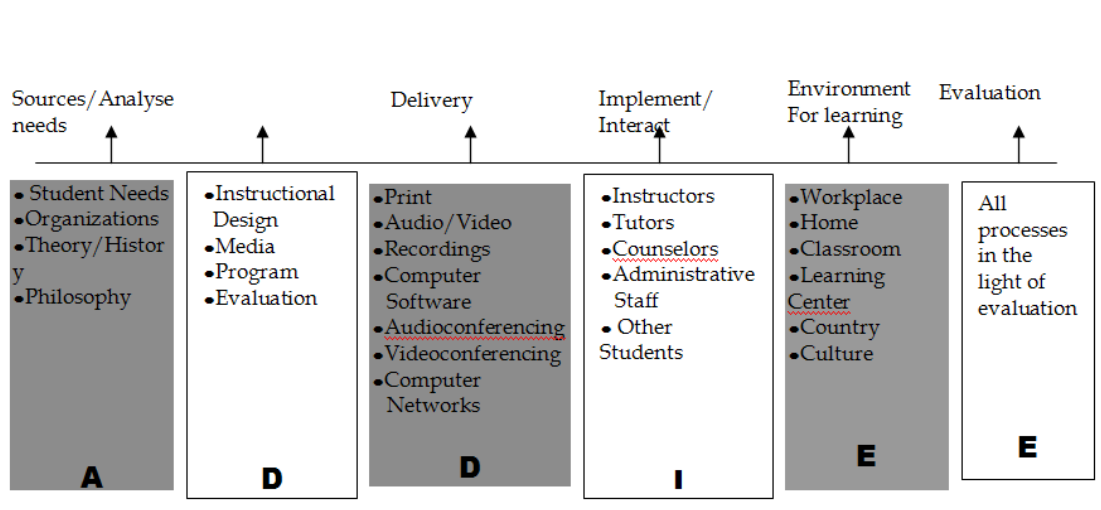
The systems model provides a tool that helps recognize the several distinctive issues that separate distance education from conventional education; helps us distinguish good practice from bad; and highlights the piecemeal and unplanned fashion in which many providing institutions operate. It is argued that “it will be better for students, teachers, and educational institutions if every distance education course was designed and developed in a systematic way and if every distance education

organisation is developed, as other modern agencies are, as a total system” (Moore & Kearsley, 1996, p. 6).

Under the systems approach, distance education components can be further subdivided into sub-components. The systems approach enables an approach to distance education that simultaneously allows a compartmentalized and a comprehensive view. That is while the sub-systems can be broken down into easily manageable functions, one does not lose sight of the interrelationships between the parts.

The following adaptation in Figure 3 of Moore and Kearsley’s systems Model of Distance Education is very useful:

**Figure 3.** Moore and Kearsley’s Systems Model of Distance Education Model (1996)



In Figure 3, note that the different components of distance education having been broken down into smaller, more manageable pieces from which it is easier to elicit data and intervene. The transactional processes also become clearer, as does the interplay between the numerous factors beyond the teacher and the learner. It is based on an extended version of the ADDIE model (Analyse, Design, Develop, Implement and Evaluate). The ADDIEE model here, however, stands for: Analyse, Design/Develop, Delivery, Implement/Interact, Evaluate. An additional E – Environment – has also been deliberately added.

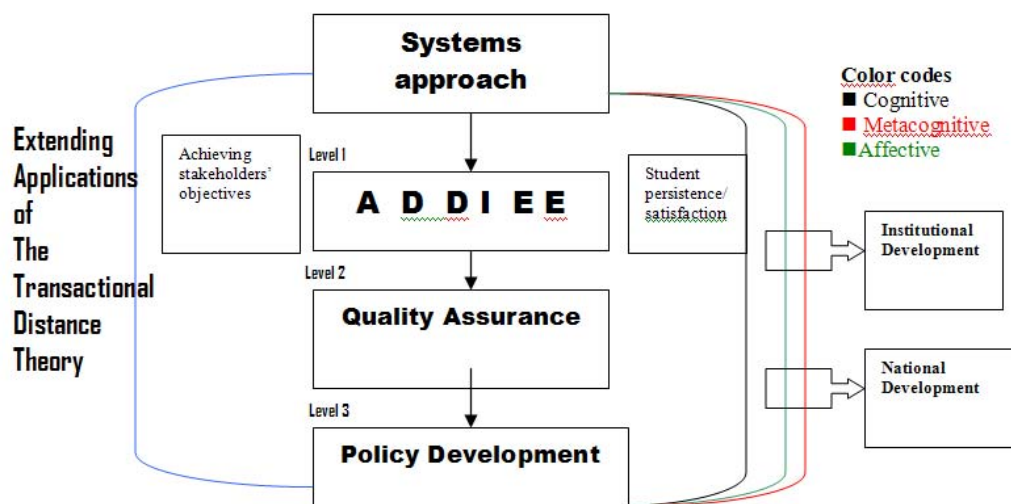
The above systemic model also takes into consideration the contextual element – that is, the added E for Environment. This implies addressing a range of issues including creating quality learning resources using technologies suitable for the target audience and the content of the learning programme, introducing mechanisms supporting distance learners, establishing efficient administrative processes based on appropriate organizational structures and ensuring that quality assurance procedures operate. At this point it is worthwhile to understand whether or not the Transactional Distance Theory has applications beyond simply the teaching and learning transaction within a given organisation.

## Can Transactional Distance Theory Have Other Applications?

Education is everybody’s business – the individual, the organisation, and the nation state. It is argued that as an agent of development, the government is responsible for what happens on its territory and for protecting its citizens as consumers of higher education. This responsibility should also be extended to all its providers, public and private, especially when the qualifications awarded purport to come from the home country. Quality assurance is at the heart of distance education policy development and becomes crucial in contributing towards making distance provision globally competitive, portable across borders, and finally in protecting consumers of education. The following, as illustrated in

Figure 4, is a proposed model of extending the applications of the Transactional Distance Theory to include wider concerns that should be recognised as part of the systems model.

**Figure 4.** Proposed Model for Extending the Applications of Transactional Distance Theory



Based on the systems approach, there is a cascading effect from one level to another as represented by the systemic approach at Level 1, quality assurance at Level 2, to policy development at Level 3 (see Figure 4). At Level 2, quality assurance can take an overarching perspective. Quality assurance in distance education is constantly evolving, as reflected by changing learner profiles and educational technologies. Using the systems approach effectively, quality assurance plans enable institutions to check the health of measurable factors like the quality of applications, enrolments, student achievement, quality of course materials, course development processes, and learner and teacher satisfaction. Quality assurance procedures are meant to focus on improving the learner-centeredness approach to its clientele.

On the other hand, distance education policies provide a framework for distance education and open learning operations – they provide courses of action with clearly defined inputs based on specific, contextual resources; clearly articulated processes and finally well-enunciated desired outcomes. These can be at national or institutional levels. With regard to the innovative nature



of distance education, policies become especially important since distance education is perceived as different from traditional classroom instruction, “or involves the collaboration of different groups, or might divert resources of money and people’s time from conventional methods, it will raise issues that require policies to be made not only within the institution, but also outside, perhaps at state or even national levels” (Moore & Kearsley, 1996, p.184). Policy contributes to better understanding of a concept that is related to national concerns and contributes to more effective and efficient practice.

The field of policy development is very complex. The expanding nature of distance education makes it even more complex. As Pacey and Keough (2003) argue, “a policy typically speaks to context, resources, activities, and desired outcomes” (p. 402). Broadly, thinkers in this field discuss distance education policy in terms of education and telecommunications policies that are in turn influenced by an increasing emphasis on innovation and partnership which directly impact on institutional planning strategies. In addition thinkers like Simonson and Bauck (2003) agree that “one key indicator that distance education is moving into the mainstream is the increased emphasis on the need for policies to guide its effective growth” (p. 417). They also provide a comprehensive list of categories that should constitute the research agenda for distance education policies: academic; fiscal, geographic, and governance policies; faculty policies; legal policies; student policies; technical policies and finally philosophical policies. Speaking about the USA, Lezburg (2003) draws attention to the problems that may arise either in the absence of policy or in the existing disparate types of policies that have been developed across the United States. Sherry (2003), on the other hand, notes the importance of research on quality assurance in distance education and brings into dialog three differing viewpoints relating to the institution, the instructor, and the learner respectively into one comprehensive perspective and argues that these should form part of a national policy framework or guidelines to ensure the sustainability of the desired interventions (Sherry, 2003). Interestingly, Kaufman and Watkins (2003) provide an innovative framework that “lies beyond the boundaries of the conventional thinking within higher education . . . and will likely challenge many of the ‘truths’ on which many institutions have built their past success” (p. 507). These authors argue that institutional goals should be based on an understanding of potential student market. For example, TDT can be useful in providing intelligence regarding the degree of structure/ dialog required; which will be required to indicate, for instance, the number of teachers an institution will need to employ, the type of student support that will be required, the media that needs to be used and so forth. This, in turn, will also provide information regarding the level of the target audience (e.g., implications for national development) and will also indicate, for example, the type of labour that will be available in any given country post-training/ educational program.

Transactional Distance Theory positively influences policy development because it gives indications on how meaningful student measures can be taken to decrease distances to ensure students’ cognitive, meta-cognitive, and affective needs are effectively met. In turn, as students benefit from enhanced quality distance education, this can be entrenched in policy development.

## **Discussion**

Policy provides a map, guidelines, and sets parameters that determine the level of acceptable quality at one particular moment in time. The above has been an attempt to demonstrate that the Transactional Distance Theory can have applications beyond simply measuring distance in terms of structure and dialog. It is useful along all the supply-chain of the distance education enterprise – not simply teaching and learning, but also based on the strands for student persistence. In sum, TDT can indicate whether intervention should be in terms of cognitive, meta-cognitive, or

affective. TDT can indicate whether such intervention should affect needs analysis processes; design and development issues; delivery concerns; interaction or teaching/ learning transaction; implementation, context; and evaluation. It can also provide a sound understanding of what constitutes quality based on any one component within the systems model. This level of understanding can then feed into policy development – an absence of a policy that actually and effectively articulates the range of provisions that promote quality would imply an irregularity in the parameters of interventions. Such irregularity makes it difficult to achieve consensual acceptance. Policy is instead seen as a determinant of quality, and this establishes a link between the two. It is important, however, to determine the strength of that linkage to justify the resources and energies that should be spent on policy development. Since public policy usually influences institutional policy, policy and quality are intimately linked and together contribute to institutional as well as national development. Further research is thus warranted to firmly establish the argument that the Transactional Distance Theory can go beyond simply measuring distance and can usefully inform quality assurance and policy development for distance education. Further research should be able to test and validate the new proposed synergy.

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## **Connectivism: Learning theory of the future or vestige of the past?**

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### **Abstract**

Siemens and Downes initially received increasing attention in the blogosphere in 2005 when they discussed their ideas concerning distributed knowledge. An extended discourse has ensued in and around the status of ‘connectivism’ as a learning theory for the digital age. This has led to a number of questions in relation to existing learning theories. Do they still meet the needs of today’s learners, and anticipate the needs of learners of the future? Would a new theory that encompasses new developments in digital technology be more appropriate, and would it be suitable for other aspects of learning, including in the traditional class room, in distance education and e-learning? This paper will highlight current theories of learning and critically analyse connectivism within the context of its predecessors, to establish if it has anything new to offer as a learning theory or as an approach to teaching for the 21st Century.

**Keywords:** e-Learning; online learning; open learning; distance education; pedagogy; learning theory; educational theory

### **Introduction**

To what extent do existing learning theories meet the needs of today’s learners, and anticipate the needs of learners of the future? Since Siemens’ *Connectivism: Learning as Network Creation* (2005) and Downes’ *An Introduction to Connective Knowledge* (2005) initially garnered increasing attention in the blogosphere in 2005, an extended discourse has ensued in and around the status of connectivism as a learning theory for the digital age. Kerr (2007d) identifies two purposes for the development of a new theory: it replaces older theories that have become inferior, and the new theory builds on older theories without discarding them, because new developments have occurred which the older theories no longer explain.

If older theories are to be replaced by connectivism, then what are the grounds for this measure? If connectivism is to build on older theories, how is the integration of the old and new theories to be conducted? Forster (2007) maintains that for connectivism to be a learning theory, the theory’s limitations and the full range of contexts in which learning can take place must be

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accounted for. Otherwise, connectivism's implementation by teachers may be insufficient and misguided.

With the changes that have occurred as a result of increased accessibility to information and a rapidly evolving technological landscape, educators in higher learning institutions have been forced to adapt their teaching approaches without a clear roadmap for attending to students' various needs. The wide range of approaches and learning paths that are available to redesign curricula cause friction for educators and instructional designers who are required to deliver course materials in accordance with learning outcomes prescribed and mandated by educational institutions.

## Overview of Connectivism

Connectivism is a theoretical framework for understanding learning. In connectivism, the starting point for learning occurs when knowledge is actuated through the process of a learner connecting to and feeding information into a learning community. Siemens (2004) states, "A community is the clustering of similar areas of interest that allows for interaction, sharing, dialoguing, and thinking together."

In the connectivist model, a learning community is described as a *node*, which is always part of a larger network. Nodes arise out of the connection points that are found on a network. A network is comprised of two or more nodes linked in order to share resources. Nodes may be of varying size and strength, depending on the concentration of information and the number of individuals who are navigating through a particular node (Downes, 2008).

According to connectivism, knowledge is distributed across an information network and can be stored in a variety of digital formats. Learning and knowledge are said to "rest in diversity of opinions" (Siemens, 2008, para. 8). Learning transpires through the use of both the cognitive and the affective domains; cognition and the emotions both contribute to the learning process in important ways.

Since information is constantly changing, its validity and accuracy may change over time, depending on the discovery of new contributions pertaining to a subject. By extension, one's understanding of a subject, one's ability to learn about the subject in question, will also change over time. Connectivism stresses that two important skills that contribute to learning are the ability to seek out current information, and the ability to filter secondary and extraneous information. Simply put, "The capacity to know is more critical than what is actually known" (Siemens, 2008, para. 6). The ability to make decisions on the basis of information that has been acquired is considered integral to the learning process.

The learning process is cyclical, in that learners will connect to a network to share and find new information, will modify their beliefs on the basis of new learning, and will then connect to a network to share these realizations and find new information once more. Learning is considered a "... knowledge creation process . . . not only knowledge consumption." One's personal learning network is formed on the basis of how one's connection to learning communities are organized by a learner.

Learners may transverse networks through multiple knowledge domains. The peripheries of knowledge fields are porous, allowing for the interdisciplinary connections to be made. Siemens asserts, "The ability to see connections between fields, ideas, and concepts is a core skill"

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(Siemens, 2008, para. 10). The connectivist metaphor is particularly timely, since the navigation of the Internet and the means by which information is dispersed on the Internet now provides a reference point for Siemens' assertions.

## Is Connectivism a Learning Theory?

Gredler (2005) refers to four constituent elements that must exist to qualify a theory as well-constructed:

Clear assumptions and beliefs about the object of the theory should be highlighted; key terms should be clearly defined; there should be a developmental process, where principles are derived from assumptions; and it should entail an explanation of "underlying psychological dynamics of events related to learning." (cited in Siemens 2006b, p. 28)

Juxtaposed with this framework, Siemens (2006b) suggests:

Instead of modelling our knowledge structures as hierarchical or flat, confined belief spaces, the view of networks enables the existence of contrasting elements selected on the intent of a particular research or learning activities. If the silos of traditional knowledge classification schemes are more fluid, perhaps the individual elements of different theories can be adopted, as required, to solve more nuances of learning problems. When the theory does not require adoption in its fullest (i.e. interpretivism or positivism), the task of seeking knowledge becomes more salient. (p. 29)

In *Theories of Developmental Psychology*, Miller (1993) distinguishes between "theory" and "developmental theory," and identifies the vast deficit that can exist between the two. In general, an emerging theory should fall within the domain of scientific research, use scientific methods, and be based on previously conducted studies. It should be logically constructed and verifiable through testing.

In contrast, a developmental theory may attempt to take strides towards becoming an established formal theory over time. Developmental theories are fertile testing grounds for ideas, which, in turn, may lead to empirical research that can then validate – or disprove – formal hypotheses posited within the framework of the scientific method. They attribute meaning to facts within the context of a broad organizational framework. The framework may place particular emphasis and interest on some facts over others, which in turn can lead to further inquiry on the basis of a prioritization of information.

Miller (1993) identifies three main tasks that developmental theories should fulfill:

- To *describe* changes *within* one or several areas of behaviour
- To *describe* changes in the relationships *among* several areas of behaviour
- To *explain* the course of development that has been described in terms of the first two tasks. (Miller, 1993, pp. 5,6)

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How does connectivism fulfil these tasks? The model frames learning in terms of learners connecting to nodes on network, suggesting that knowledge does not reside in one location, but rather that it is a confluence of information arising out of multiple individuals seeking inquiry related to a common interest and providing feedback to one another.

Downes (1996) suggests that an ‘emergentist’ theory of learning must treat knowledge as ‘*subsymbolic*’. According to Downes, knowledge is treated as “. . . a recognition of a pattern in a set of neural events [if we are introspecting] or behavioural events [if we are observing]” (para. 31). Additionally, knowledge is the experience of “. . . a mental state that is at best seen as an *approximation* of what it is that is being said in words or experienced in nature, an approximation that is framed and, indeed, comprehensible only from which the rich set of world views, previous experiences and frames in which it is embedded” (para. 41).

The developmental implications of Downes’ definitions of learning and knowledge are far-reaching. If learning transpires via connections to nodes on the network, then it follows that the maximization of learning can best be achieved through identifying the properties of effective networks, which is precisely what Downes sets out to achieve in *Learning Networks and Connective Knowledge*.

Connectivism is mainly concerned with cognitive development, and as such does not concentrate on explaining how connections to networks may be interpreted in relation to physical maturation or the changes that occur over time via a person’s exposure to, and interaction, with the social world. This is particularly the case where explaining behavioural performance and moral development in specific contexts is concerned.

Siemens (2006b) highlights other factors that may inform the development of a new learning theory, namely “how we teach, how we design curriculum, the spaces and structures of learning, and the manner in which we foster and direct critical and creative thought in our redesign of education” (p. 6). A multitude of elements could change with the introduction of a new theory.

With the advent of new considerations in instructional design and implementation, universities are taking the task of adapting their instructional approaches seriously. The utilization of information technology in the classroom has become a feature of instruction. What remains to be established is whether connectivism holds its own as a new theoretical model to support this endeavour.

Miller (1983) maintains:

When a person develops or adopts a particular theory, she takes on a whole set of beliefs concerning what questions about development are worth asking, what methods for studying these questions are legitimate, and what the nature of development is. . . There are unwritten rules of the game that are very much part of the theory as it is practiced. (p. 5)

Perhaps with Downes’ ‘theory of distributed knowledge’ the rules of the game have not yet fully extended from the philosophical domain into that of applied educational research, though Siemens’ connectivist model is a ripe training ground for further studies.



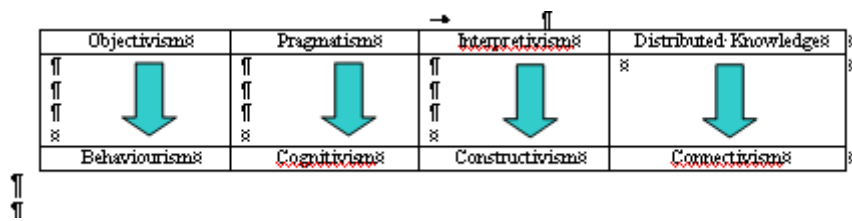
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## Epistemological Frameworks for Learning

Siemens (2008b, p. 9) draws on the work of Driscoll in categorizing learning “into three broad epistemological frameworks” namely objectivism, pragmatism, and interpretivism. According to objectivism, reality is external to the mind, and knowledge and perception are experientially acquired. Pragmatism suggests that knowledge is a negotiation between reflection and experience, inquiry and action, and interpretivism posits that knowledge is an internal construction and is informed through socialization and cultural cues.

A fourth framework is also introduced, namely Downes’ (2006) theory of distributed knowledge, which is supported by Siemens (2008b) who sees “. . . the view of knowledge as composed of connections and networked entities ...The concept of emergent, connected, and adaptive knowledge provides the epistemological framework for connectivism as a learning theory” (p. 10). Siemens sees the alignment between epistemologies and learning theories as detailed in Figure 1.

**Figure 1.** Alignment of Epistemologies and Learning Theories



The first three are universally accepted, but the concept of connectivism as a learning theory has had some criticism, including from Verhagen (2006), who argued that the theory remains unsubstantiated philosophising. Kerr suggested that existing theories “satisfactorily address the needs of learning in today’s technologically, connected age” (Siemens, 2008b). Proponents of connectivism are “exploring a model of learning that reflects the network-like structure evident in online interactions,” (p. 12) but is this enough to constitute its formulation as a new learning theory, and does connectivism have anything new to offer? Criteria must be met to establish connectivism as a learning theory. Before exploring these considerations in greater depth however, let us revisit pre-connectivist theories of learning that have influenced its development as a model.

## Pre-Connectivist Theories of Learning

Kerr (2007a) contends that the relationship between internal and external knowledge environments was accounted for in Vygotsky’s formulation of social constructivism, long before any explanation was provided by connectivism. Similarly, Kerr asserts that Papert’s constructivism and Clark’s embodied active cognition also provided explanations prior to connectivism. Communities of practice are another model that treats learning as an inherently social and situated engagement.

Vygotsky, whose name is inherently linked to social constructivism, saw two important elements in the learning process: ‘language’ and ‘scaffolding.’ Vygotsky noted how self-talk in children serves as a means by which learners may work through complex problems by externalizing them as a form of self-guidance and self-direction. From a cognitive development standpoint, this

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observation is important because the child's social interaction with others helps formulate private speech in the child. Instructional scaffolding provides support for learning and problem solving through the use of hints, reviewing material, encouragement, and reducing complex problems into "manageable chunks" (Woolfolk, 1995, p. 49). The relationship between the individual and external knowledge is present in the relationship between what is known by the learner in question, and that knowledge to which the learner is being exposed.

Papert (1991) formulated the theory of constructionism. Constructionism contends that learning occurs through learners' engaging in creative experimentation and activity. Papert distinguishes between learning and teaching, with teaching treated as secondary to the hands-on creative process – for instance, a group of children playing with Lego blocks or creating clay sculptures are 'objects to think with.' Learning, therefore, is considered an interaction between the individual and his or her environment, a relational understanding. By extension, Papert asserts that the computer's role in learning ought to be enabling, as a means for children to use knowledge.

Clark (1997) extended Papert's position with the theory of embodied active cognition, in which he argued that the scaffolding provided by language and 'objects to think with' is a mutual interaction between mind, brain, and the environment, and may draw upon multiple theoretical frameworks (e.g., connectionist, cognitivist) to explain cognition. Kerr (2007a) suggests that the ideas that are the basis of connectivism have already been developed by Clark, and that recent widespread recognition for the work of connectivism is due to the high visibility of networks in the current age (e.g., the Internet) compared with in the past. Whereas language is so ubiquitous that it is not always noticed, network-based learning theories can now unequivocally point to existing networks, such as the World Wide Web.

Lave and Wenger (2002) researched the way people learn in their daily lives and suggested the typology of a 'community of practice,' which is based on the premises that humans are social beings, and that knowledge is developed through active engagement in valued undertakings throughout their lives. Clearly, learning does not only take place within a learning institution. According to Wenger (1998),

Our institutions . . . are largely based on the assumption that learning is an individual process, that it has a beginning and an end, that it is best separated from the rest of our activities, and that it is the result of teaching. (p. 3)

Lave and Wenger (2002) do not see learning as individual; in their view learners make sense of their surroundings in a social setting, by communicating with others. Knowledge is situated within a community in which a more 'knowledgeable other' facilitates the move from the periphery to the centre of the community. People build on earlier experiences and knowledge.

### **Downes and Siemens: Connectivism**

With connectivism, the formation of connections between nodes of information (i.e., networks) constitutes knowledge – and in addition, connectivism posits that "the ability to construct and traverse those networks" (Downes, 2007) comprises learning. As Siemens (2006b) has suggested, "the learning is the network." Downes (2007b) further states:

"Where connectivism differs from those theories, I would argue, is that connectivism denies that knowledge is propositional. That is to say, these other

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theories are 'cognitivist', in the sense that they depict knowledge and learning as being grounded in language and logic. Connectivism is, by contrast, 'connectionist'. Knowledge is, on this theory, *literally* the set of connections formed by actions and experience. It may consist in part of linguistic structures, but it is not essentially based in linguistic structures, and the properties and constraints of linguistic structures are not the properties and constraints of connectivism. . . . In connectivism, there is no real concept of transferring knowledge, making knowledge, or building knowledge. Rather, the activities we undertake when we conduct practices in order to learn are more like growing or developing ourselves and our society in certain (connected) ways."

Downes (2007b) identifies "the core proposition shared between connectivism and constructivism" as knowledge 'not being acquired, as though it were a thing.' Moreover, Kerr stresses the importance of connectivism's not losing "the lessons of constructivism and the need for each learner to construct his or her own mental models in an individualistic way" (Forster, 2007, para. 1).

Verhagen (2006) criticises connectivism as a new theory, primarily because he can distil no new principles from connectivism that are not already present in other existing learning theories. Moreover, he is not convinced that learning can reside in non-human appliances.

Siemens (2006b) responded that a new learning theory, in fact, is required, due to the exponential growth and complexity of information available on the Internet, new possibilities for people to communicate on global networks, and for the ability to aggregate different information streams. Siemens argues that "knowledge does not only reside in the mind of an individual, knowledge resides in a distributed manner across a network . . . learning is the act of recognizing patterns shaped by complex networks.' These networks are internal, as neural networks, and external, as networks in which we adapt to the world around us (Siemens 2006b, p. 10).

In Miller's (1993) extended analysis of theoretical frameworks in developmental psychology, she describes contextual theories as arising out of "the intertwining of an object or person and its surroundings, the interconnectedness of contexts, and the intermingling of biology and culture" (p. 410). Presently, connectivism is lacking an extensive body of empirical research literature to lend it support. Miller (1993) argues that the "greater the distance between theory and behaviour" the greater the problems to prove or disprove the theory (p. 410).

Where connectivism draws its strength is through using Web-based activity as an example of learning looking through the connectivist lens. The analogy is intuitive and powerful because of the ubiquitous use of the Internet in today's world. In addition, Downes (2006) has elucidated an epistemological framework for distributed knowledge which provides a strong philosophical basis for the connectivist learning framework.

### **Higher Order Thinking: Learning and knowledge transfer**

Kerr (2007b) suggests that no theory, including the connectivist model, sufficiently explains higher order thinking "as a mechanism spanning brain, perception and environment." He states that "knowledge is not learning or education." He challenges connectivism to explain "transferring understanding, making understanding and building understanding", and the internal processes that lead to "deep thinking and creating understanding."

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Siemens suggests that when a learner is engaged in creating and recreating their own learning network, understanding arises through applying meta-cognition to the evaluation of “which elements in the network serve useful purposes and which elements need to be eliminated.”

Downes (2007a) contends “that ‘understanding’ is a distribution of connections across a network. To ‘know that P’ is therefore equated with ‘a certain set of neural connections’ that entail being in a certain physical state” unique to the experiencer of that state. The physical state in question is not distinct from the other physical states with which it is intertwined within that individual.

Downes asserts that in connectivism, ‘deep thinking’ or ‘creating understanding’ are equivalent to the process of making connections, and that there are no mental models *per se* (i.e., no systematically constructed rule-based representational systems), and what there is (i.e., connectionist networks) is not built, like a model; but instead it is grown, like a plant.

Kerr (2007c) suggests that words and language are necessary to sustain long predictive chains of thought – e.g., to sustain a chain or combination of pattern recognition. He contends that this is true in chess, for example, where the player uses chess notation to assist his or her memory.

Downes (2007a), however, raises two questions of importance in response to Kerr’s assertion:

‘First, do we play chess (solely) by constructing strings of inferences (i.e., sequences of moves in chess notation)? And second, even when we construct strings of inferences, is this how we actually think, or is this how we describe how we think?’ (Downes, 2007a)

Though the expression of thoughts is limited by grammatical principles in language, it may be that thoughts themselves are not necessarily bound by language, and therefore at least in some cases, may not be constrained by grammatical principles.

## Pattern Recognition

Downes (2006) contends that the assumption that we think in a language is misguided. He suggests that thinking is actually the arrangement of ‘pieces’ which are then matched to desirable (or undesirable) outcomes. What are these pieces? What gives them shape?

Whether these questions can be definitely answered, the reason for Downes’ drawing the distinction between pattern matching compared with “long predictive chains of thought” is worthy of consideration. If it is the case that reasoning is a function of pattern matching, as opposed to the rule-governed principles of physical symbol systems that define linguistic structures, then the characterization of connectivism is dramatically different from that of constructivism.

Kerr’s (2007a) assertion is that “the mind is a construct which is distributed from the brain to the environment.” He stresses that how we answer the questions ‘What is the mind?’ ‘Where is the mind?’ and ‘How does it work?’ are at the heart of the development of learning theories, and that the answers have profound practical implications.

Humans may be predisposed to identifying certain patterns on the basis of their neurological makeup; these patterns, in fact, may be intrinsic qualities of mind. Kerr (2007a) refers to Kay’s non-universals, a series of understandings (identified on the basis of research by anthropologists) that are not learned spontaneously, and which are common to all known human societies – for instance, “deductive abstract mathematics, model-based science, democracy [and] slow deep thinking.” Kerr suggests that if learning these non-universals is considered important, then

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methods ought to be identified to teach them. The suggestion is not to propound the existence of 'fundamental knowledge,' but to question and challenge the connectivist slogan, '*the half-life of knowledge is declining*' by pointing out the importance of identifying strategies to ensure that at least some forms of learning persist.

Bruner (1999) describes a situated view of mind, where it is both represented by and understood in terms of human cultural contexts. This mode is shared by a community, and is also passed on from generation to generation to maintain the culture's way of life and identity. "Although meanings are in the mind, they find their origin and significance in the community in which they were created. . . It is culture that provides the tools for organizing and understanding our worlds in communicable ways" (Bruner 1999, p. 149).

## **The Compatibility of Connectivism and Formal Education**

Three predominant pressures are influencing and instigating change in the dissemination and retrieval of information, each of which is fundamentally altering the formal educational landscape: millennial learners' needs are not sufficiently being met by traditional training models of instruction, information growth has necessitated new means by which to navigate and filter the information that is available, and advancing technologies are increasingly enabling learners to connect to one another and to knowledge networks of their own making (Siemens, 2008b, p. 7).

Verhagen (2006) sees that connectivism fits exactly at this level of pedagogy and curriculum rather than at the level of theory, since, in effect, people still learn in the same way, though they continue to adapt to the changing technological landscape. Learners might move away from classroom groups and a tutor to online networks and important nodes on these networks, but in effect the same activity takes place on a different scale – although learners might miss out on a layer of critical engagement as their choice of mentor could confirm rather than challenge views and opinions.

## **Teaching in a Connected Environment**

Developers of e-learning (Siemens, 2008) propose that the increasing influence of the Internet and online connectedness of people will have implications for educational practice. The rapid development of technology and exponential growth in the use of the Internet, along with Web 2.0 and mobile developments, make new and different educational structures, organisations, and settings a possibility. The online and face-to-face networks that people build-up throughout their lives will provide expertise and knowledge, in addition to the guidance that local or online tutors can provide. Learners will be at the centre of the learning experience, rather than the tutor and the institution. Learners will be instrumental in determining the content of the learning, in addition to deciding the nature and levels of communication, and who can participate.

The role of the tutor will not only change, but may disappear altogether. People can move from a learning environment controlled by the tutor and the institution, to an environment where they direct their own learning, find their own information, and create knowledge by engaging in networks away from the formal setting. They still communicate with others, but their personal interests and preferences – rather than institutional requirements and choices – are the main drivers for their engagement with more knowledgeable others in their learning.

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The networks in which people communicate can be small or vast, but the main characteristics for networks to support knowledge development will be that they are diverse, open, autonomous, and connected (Downes, 2007c). There are parallels with Illich's (1971) educational vision of the 1970s, particularly his idea of 'community webs.' Online networks also come together as interest groups of autonomous participants, but Illich envisaged his webs in community settings and aimed at bringing local people together with learners and 'people with knowledge.' Online networks might be open and may facilitate connections, but local culture and values cannot be incorporated all that easily as the online networks are global, with diverse participants, each bringing his or her own ideas and background to the fore. This might stimulate debate, but the local community and its development would be of less importance than the dominant culture on the network.

There have been concerns about the lack of critical engagement online (Norris 2001), because of the temptation to connect with like-minded people, rather than in more challenging transactions, with experts such as the teacher in a classroom, whose role is to make people aware of alternative points of view. Critical educators, such as Freire and Macedo (1999), thought it essential that teachers have a directive role. In this capacity, teachers would enter into a dialogue "as a process of 'learning and knowing' with learners, rather than the dialogue being a 'conversation' that would remain at the level of 'the individual's lived experience.' I engage in dialogue because I recognise the social and not merely the individualistic character of knowing" (Freire & Macedo, 1999, p. 48). He felt that this capacity for critical engagement would not be present if educators are reduced to facilitators, which is the role of the tutor that has been widely accepted in e-learning (Salmon, 2004). Moreover, in a connectivist online environment, with an emphasis on informal learning and the individual's choice to engage with experts outside the classroom, this critical and localized influence could be lost completely. The lack of critical engagement by a tutor – on top of the diminishing level of control by the institution – implicates a high level of learner autonomy.

Current research in adult education shows that the levels of confidence and learner autonomy, in addition to discipline, are of crucial importance to the level of engagement by the learner in a personalized learning environment, as lack of these in the majority of participants hampered their learning online. Nearly all students preferred the help and support of the local or online tutor to guide them through resources and activities, to validate information, and to critically engage them in the course content (Kop, 2008), which would indicate the need for a localized tutor presence.

Downes and Siemens do not suggest that connectivism is limited to the online environment. The online environment is one application that has been important for the development of connectivism, but the theory applies to a larger learning environment, and helps to inform how we understand our relatedness to the world, and consequently how we learn and understand from it. Networks are not just comprised of digitally enabled communications media, nor are they exclusively based in neurological brain-based mechanisms. The networks to which Downes and Siemens are referring are the relationship between 'internal' and 'external' physical environments. As Siemens suggests, *the learning is the network*.

Though an increase in the ability to converse and collaborate has occurred with the advent of new information and communication technologies, Kerr (2007a) reminds us that "good educators have always recognized the importance of these things." What has changed is the scalability of communication, though it does not follow that at the level of learning theory, a new innovation or idea has been discovered: "The scaling is not actually innovation."

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## Conclusion: Radical discontinuity

Kerr (2007a) asserts that “we are entering some sort of period of radical discontinuity,” and further raises the question: “What is the nature of that radical discontinuity?” In the educational domain, a multitude of Web applications are being used to enhance the learner experience, particularly in terms of collaboration and communication. New learning environments are informing present and future trends from which both educators and students stand to benefit. Moreover, the way in which global networks and communities of interest are currently being formed through emerging technologies is encouraging young people, in particular, to develop new, creative, and different forms of communication and knowledge creation outside formal education. Of course the number of learners who have been immersed in these technologies all their lives will grow, as the young are more predisposed to use the latest technologies (National Statistics, 2007) and will displace the learners who have grown up with books and pen and paper as resources for learning. This will undoubtedly cause friction in institutions and class rooms, particularly as (adult) educators themselves do not always feel comfortable with the new developments because they have not been shown adequately, or explored for themselves, how the new and emerging technologies could enhance their working practice. Furthermore, school systems have not developed a connectivist model within which to deliver curricula, partly because educational staff and institutions have not caught on to the possibilities that digital technology have to offer, and partly because not all people are autonomous learners. Additionally, school systems tend to value education that is grounded in traditions of the past, steeped in values that have developed over centuries. If, however, learners’ worlds inside and outside education become too disparate, new learners who are familiar with the opportunities for learning on the Internet will be able to find their experts elsewhere. There is a need for (adult) educators to closely follow and influence the developments and the debates, and seriously research how their institutions can evolve using the emerging technologies to their and their learners’ advantage. In doing so, they would ensure that (adult) education can secure its role of critical engager, and at the same time make the best use of technology – that is in making connections with information and knowledgeable others all over the world to enrich learners lives and the communities in which they live.

A paradigm shift, indeed, may be occurring in educational theory, and a new epistemology may be emerging, but it does not seem that connectivism’s contributions to the new paradigm warrant it being treated as a separate learning theory in and of its own right. Connectivism, however, continues to play an important role in the development and emergence of new pedagogies, where control is shifting from the tutor to an increasingly more autonomous learner.

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## **Post-Secondary Students' Purposes for Blogging**

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### **Abstract**

The goal of the study was to explore post-secondary students' purposes for blogging with particular attention to the social and instructional purposes. The sample of blogs came from an all-women's college in the United Arab Emirates. Content analysis was conducted on eight blogs using previously tested instruments to identify social presence and knowledge construction. Authors of the blogs participated in a focus group discussion about the purposes for blogging. Findings revealed that the primary use of blogging was for social purposes. Self-disclosure was the most notable purpose for blogging, in addition to sharing emotional responses to learning. The lack of teaching presence may have influenced students' use of blogging for social rather than instructional purposes.

**Keywords:** Blogging; Post-secondary; teaching presence; social presence; knowledge construction

### **Introduction**

The goal of the study reported on in this paper was to explore post-secondary students' purposes for blogging with particular attention to social and instructional purposes. To achieve this goal, a content analysis was performed on eight blogs using previously tested instruments to identify social presence (Rourke, Anderson, Garrison & Archer, 2001) and knowledge construction (Gunawardena, Lowe & Anderson, 1997). A focus group discussion with the authors of the blogs also explored students' purposes for blogging.

A blog can be defined as a "personalized webpage, kept by the author in reverse chronological diary form" (Du & Wagner, 2005, p. 2) or "a personal diary, kept on the web" (Fun & Wagner, 2005, p. 221). Blogs are also considered to be educational social software which can give students a social presence (Anderson, 2005). Social presence "is correlated with student satisfaction and higher scores on learning outcomes" (Anderson, 2005, p. 2) and has been defined as the ability to present oneself "to the other participants as real people" (Garrison, Anderson & Archer, 2000, p. 89). Blogging functions as a means for students to pursue the individual activity of recording their experiences for the purpose of revisiting and reflecting upon those experiences (Xie & Sharma, 2005). Downes (2004) discussed how students use blogs to "get to know each other better by visiting and reading blogs from other students" (p. 18).

Case studies of blogging are concerned with issues including the degree to which blogging can promote constructivist learning methods (Freeman, Brett, Kostuch, MacKinnon, McPherson et al., 2006; Xie & Sharma, 2005). Some studies have found that blogging can provide a sense of ownership over work which seems to motivate students, not only to continue blogging but to make greater efforts in their studies (Dickey 2004; Du & Wagner, 2005).

In terms of individual purposes for blogging in an educational context, Brooks, Nichols and Priebe (2004) found that the majority of their students preferred to write journal style entries regardless of the course they were enrolled in. Betts and Glogoff (2004) also discuss how students tended to start posting about topics of interest regardless of their actual task. Furthermore, in a random sampling of personal blog usage, Herring, Scheidt, Bonus and Wright (2004) discuss the fact that 70.4 percent of the blogs they sampled were journals. They also noted that the “flexible, hybrid nature of the blog format means that it can express a wide range of genres, in accordance with the communicative needs of its users” (p. 11). The flexible nature of the blogging medium suggests that there are a variety of possible purposes for blogging regardless of the context within which the activity is pursued.

In terms of blogging as compared to other social software, Xie and Sharma (2005) noted in their study that there is a need for future investigation into students' perceptions of blogs compared to other online technologies and students' interpreted purposes and motivations of using blogs. They commented that student perceptions of blogs are essential to understanding how students might interact with the blogging medium and for what purposes they might use blogging.

### **Purposes for Blogging: A review of the literature**

Herring, Scheidt, Bonus and Wright (2004) noted that the “flexible, hybrid nature of the blog format means that it can express a wide range of genres, in accordance with the communicative needs of its users” (p. 11). The flexible nature of the medium suggests that there are a variety of possible purposes for blogging regardless of the context within which the activity is pursued. Some studies have found that blogging can provide a sense of ownership over work. The sense of ownership may motivate students, perhaps from a sense of pride, to continue blogging and to make greater efforts in their studies (Dickey, 2004; Du & Wagner, 2005). In the following table, we summarize the purposes of social software and blogging according to author.

**Table 1.** Summary of Purposes of Social Software and Blogging

Purposes	Author
<ul style="list-style-type: none"> <li>• supports group interaction</li> </ul>	Anderson, 2005
<ul style="list-style-type: none"> <li>• indicates user on-line presence; notification of new content; filtering of content; cooperative learning support; referring; modeling of interaction; help features; and documenting, storing and sharing of content</li> </ul>	
<ul style="list-style-type: none"> <li>• may facilitate social presence</li> </ul>	
<ul style="list-style-type: none"> <li>• offers a means to share knowledge and help others</li> </ul>	

- 
- can potentially facilitate social interactions
  - facilitates group communication Grant, 2006
  - enables simple interaction, feedback and networking Boyd, 2003
  - enables document sharing, control of communications, and limits access to the shared site.
  - transforms the learning process from a “personal activity to a social activity” Anderson & Kanuka, 1998
  - can potentially expose learners’ ideas and opinions more readily to an audience
  - can more readily expose learners to audience’s ideas
  - can record experiences for reflection Xie & Sharma, 2005
  - supports learning by providing different viewpoints
  - allows students to get to know each other Downes, 2004
  - allows social learning experience to flow from learner to group and from group to learner.
  - acts as a replacement for regular class web pages; links page; discussion forum; seminar hosting forum; forum for student writing; personal publishing tool for educators
  - can create an on-line community with a common focus
  - transforms the individual learning process into a social learning experience Garrison, 1995
  - supports community-centered instruction Gergen, 2002
  - can foster group learning situations where each individual contributes knowledge to the group Anderson & Kanuka, 1998
  - increases opportunities for social interaction Grant, 2006; Gergen, 2001
  - allows collaborative activities Du & Wagner, 2005
  - can provide a source of motivation through the “immediacy and frequency” of feedback
  - supports casual socialization Dickey, 2004
-

- 
- may help ease feelings of isolation and alienation
  - facilitates distinguishing between differing viewpoints, accepting different interpretations Jonassen, Carr & Hsiu-Ping, 1998
  - can provide a forum for knowledge-building activities Scardamalia & Bereiter 1999
  - can foster collaborative learning within an organized community Hakkinen & Jarvela, 2006
  - affords the chance to put thoughts “in the context of others” Oravec, 2002
  - allows students to outline their own perspectives
  - provides a sense of development over time
  - shifts the onus from the teacher to the educational group Educause  
*Horizon Report*,2005
  - allows students to share a wide range of generic knowledge Brooks, Nichols, & Priebe, 2004;  
Oravec, 2002
  - acknowledges the attributes of learners as individuals and as a group Glogoff, 2005
  - expresses the importance of social and peer interaction
  - highlights the importance of individual contributions
  - gives learners an opportunity to make themselves heard
  - enables students to assert their own perspectives and so make a greater effort
  - helps to motivate students Wang, Fix & Bock, 2004
  - provides a certain sense of empowerment Huffaker & Calvert, 2005
  - can provide a catalyst to face-to-face interactions Seitzinger, 2006
- 

From this summary of the literature related to social software, we identify two major themes. The first relates to social interaction and social presence, and suggests that one general purpose for blogging may be to support, facilitate, model, and increase opportunities for social, peer and group interaction, communication, presence, feedback, networking learning experiences, and getting to know each other.

The second theme relates to the social and collaborative construction of knowledge and suggests that an additional purpose for blogging may be to support, contribute to, and provide opportunities or means for collaborative, cooperative and community-centered sharing, building,

contributing, outlining and asserting knowledge, ideas, opinions, different viewpoints, interpretations, perspectives and common goals.

From this framework, we derived two purposes for blogging one being social and the other for knowledge construction. These are purposes that have been largely identified from a theoretical perspective rather than an empirical one. In this study, we frame our investigation in terms of these two purposes. We investigate the case of a group of post-secondary learners in relation to how they engaged in blogging for social and instructional purposes.

## **Methods**

### ***Context of the Study***

Our study was conducted in the Foundations Department of the Dubai Women's College where all students must purchase a wireless-enabled laptop. Blogging is an ancillary activity to an e-portfolio project, which runs from week eight to week 16 of a 20-week-long second semester. Faculty involved in the facilitation of the blogging activity included the principal investigator and the other two members of the Applied Computing faculty at the Dubai Women's College. The faculty introduced blogging to provide students a place to record and share their experiences in developing the e-portfolio. All Foundations students were required to create a blog using *Blogger* (Google, 2006). Faculty gave students a one-hour basic training session on how to make a blog entry, or post, and how to comment on others' posts.

### ***Participant and Blog Selection***

Participants were recruited from the 2005-2006 cohort of Foundation year students. This cohort included 309 students, all of whom created a blog to which they made at least one posting. All students are Emirati citizens, female, and between 17 and 20 years old. Of the 309 blogs created at the outset of the project, 43 were deleted and were no longer available on the Internet, leaving a total of 266 blogs and potential participants for inclusion in the study.

To be selected for inclusion in the study, blogs had to demonstrate evidence of both social presence and interaction and knowledge construction. Rourke et al. (2001) presented a set of indicators used for assessing social presence which was adopted for the blogging analysis. The authors identified three categories of responses indicative of social presence: affective, interactive, and cohesive. We examined the 266 blogs for interactive responses. To have interactive responses, each blog had to have at least one comment from another student. Of the 266 available blogs, 77 contained comments from other students. These blogs were then analyzed for evidence of the other two categories of responses. This analysis reduced the sample to 47 blogs.

The second criteria is evidence that social software and blogging supports, contributes to, and provides opportunities for: collaborative, cooperative and community-centered sharing, building, contributing, outlining and asserting knowledge, ideas, opinions, different viewpoints, interpretations and perspectives, and common goals. These purposes outline the concept of the social construction of knowledge as facilitated through computer-mediated communication. Gunawardena et al. (1997) described a process of knowledge construction through computer-mediated communication and developed an interaction analysis model to "explain the process by which construction of knowledge occurred" (p. 412).

The 47 blogs that contained evidence of social presence as indicated by Rourke et al. (2001) were then analyzed for evidence of social construction of knowledge as outlined by Gunawardena et al. (1997). To meet these criteria, blogs had to demonstrate evidence from at least one phase. This analysis reduced the number of sample blogs to nine.

### ***Focus group***

The nine students were contacted by email and asked if they would be willing to participate in a focus group discussion. Eight students responded positively to the request. A focus group can be defined as a “guided group discussion of selected topics” (Ruane, 2005, p. 157) with a limited number of people. Participants for focus groups are selected because “they have certain characteristics in common that relate to the topic” (Krueger & Casey, 2000, p. 4).

Each focus group took approximately 45 minutes. At the time of the interviews, the students were no longer in a student-teacher relationship with the interviewer. We asked a predetermined set of questions. Some examples are as follows: Why did you select the pictures and images or fonts colours? Why did you select the pictures and images or fonts colours? What motivated you to post? What motivated you to comment on others' blogs? How useful or not useful were others comments to you? An Arabic speaking colleague was asked to accompany the interviewer to provide students with suggestions for English vocabulary and terminology. The focus group discussions were digitally recorded and a complete transcript was prepared.

## **Analysis**

We examined each blog using the instruments to identify social presence and social construction of knowledge, and then compiled a profile of each blog. The profiles included a general overview of the blog based on the quantitative data, a description of the social presence established by the student, and a description of the evidence found for knowledge construction. For the focus groups, we followed an inductive approach, looking for repeated keywords and ideas. As categories were identified, the focus group data were reviewed in light of these emerging categories. Repeating ideas were organized according to criteria including positive or negative comments, vague or specific, tone, and similarity to other comments (Krueger & Casey, 2003; Litoselliti, 2003). Once we organized the focus group data according to main ideas or concepts, we added these data to the profile of each blog.

## **Presentation and Discussion of Findings**

### ***Social presence***

The most obvious indicators of social presence are interactive responses (Rourke et al., 2001), which can be found simply by opening blogs and looking for comments at the bottom of each post. The blogs included other types of interactive responses, such as compliments on each others' blog design, or on achievements noted in the posts, and statements of agreement with others' comments or posts. Students also replied to comments on their blogs with expressions of gratitude towards the visitors. Rourke et al. (2001) noted that these types of interactions, “express a willingness to maintain and prolong contact” (Interactive Responses, ¶1). There were few comments or replies, however, from visitors that tried to continue a conversational thread, indicating that these interactive responses were somewhat superficial and that their role was

limited to encouraging and prolonging contact. There was little effort from any of the students to actually continue a conversation through the comments.

Evidence of social presence can also be found in the social greeting conventions, or cohesive responses, used. Rourke et al. (2001) described three main types of cohesive responses: phatics, e.g., inquiries about health or family; salutations and greetings; and vocatives, e.g., the use of names and inclusive pronouns (Cohesive Responses, ¶1). The more prolific writers seemed to be those who made the widest use of these social conventions. A number of students, however, did not use any cohesive devices.

Since few postings actually developed into an extended exchange of content or ideas, perhaps the medium of blogging is such that students need time to develop a strategy to create more meaningful exchanges. Perhaps the new blogging medium gave students the feeling that normal social conventions are not required. It is also possible that the physical proximity of students to each other may have inhibited the development of deeper relationships through blogging. For example, one student noted that when she received comments from students she did not know, she emailed these students to follow-up with them rather than reply through the blog.

In the focus group, students discussed the importance of attracting attention from others and suggested that getting comments “was a competition”. They also said that they had to “fight to get comments”. Other students said that they were compelled to attract comments because “comments make you feel proud”. One student went so far as to claim that receiving no comments was like “life without water”. Other studies have also noted the importance students attach to receiving comments on a blog. Nardi, Schiano, and Gumbrecht (2004) stated that bloggers “reported that they gained momentum when they realized others were actually reading their posts” (p. 3). They also found, however, that “the relationship between blogger and reader was markedly asymmetrical. Bloggers wanted readers but they did not necessarily want to hear a lot from those readers” (p. 7).

## **Self Disclosure**

The most notable similarity between the blogs is found in the affective response of self-disclosure. Joinson (2001) described self-disclosure as the “act of revealing personal information to others” (Self-disclosure and CMC, ¶1). Although students were directed to record their experiences with the e-portfolio project, the content analysis of the blogs revealed that all of the study’s participants disclosed personal information concerning either their private life or their public, college life. Additionally, in the focus group, respondents referred to “posting about [their] lives”, “sharing happiness”, and “used as a diary” when articulating their purposes for blogging. Students commented that they found sharing personal information much more compelling than sharing factual information.

Students who disclosed the most personal information were also those who generated the most content in terms of posts and word counts. These students also received the highest number of comments from other students. It is possible that self-disclosure by one student may invite other students to comment and interact with them. It is possible as well, judging by the students’ positive reaction to comments on their blogs, that this form of interaction motivated the students to disclose more personal information, which, in turn, invited more comments from other students. Harper and Harper (2006) noted that in their study some students commented that seeing other students share personal information inspired them to also disclose information. Ma,



Li and Clark (2006) suggested that self-disclosure is a result of “the fundamental social need” (p. 6) to connect with other people.

A number of students shared descriptive information concerning diverse topics, such as how they spent their weekend, presents they received for their birthday, or their favorite brand of chocolate. In most instances, students noted that they wanted their friends and classmates to know what they thought about these different topics and they also wanted to read their friends' opinions on these topics.

Several students commented that they posted personal information on their blog to provide a diary for themselves. The value of blogging as a forum for personal reflection or journal writing has been noted in other studies (Du & Wagner, 2005; Freeman et al., 2006; Hernandez-Ramos, 2004). Aside from educational purposes, other studies have found that one of the predominant styles of personal blogging was a personal journal (Herring et al., 2004; Nardi, Schiano, Gumbrecht, & Swartz, 2004).

One student who wrote several posts in a diary format claimed that she felt inspired to write more posts in this style when she realized students enjoyed reading her diary and were leaving comments. She noted her surprise that other people were actually interested to read about her personal activities. Despite the fact that students made diary-style entries, however, as Nardi, Schiano, Gumbrecht, and Swartz (2004) noted, “most bloggers are acutely aware of their readers, even in confessional blogs, calibrating what they should and should not reveal” (p. 42). All students also engaged in evaluative self-disclosure (Harper & Harper, 2006). In one instance, a student asked for opinions on her new mobile phone and asked for comments on other brands of phones. In another, a student shared her affection for a particular brand of chocolate.

Students also reported that they used the design features of the blogging software in part to reflect their personality and display emotions. In fact, one of the most visible similarities between the blogs is the level of personalization achieved by varying the design of the posts including font styles, and the incorporation of photos and images in the posts of all but one blog. Many students mentioned that the personality or design of the various blogs inspired them to either make a new post on their own blog or comment on others' blogs. Fun and Wagner (2005) also noted in their study that students used technical features of the blogging software to personalize the look of their blogs.

Rourke et al. (2001) discussed self-disclosure as one of the primary affective means of establishing social presence. Furthermore, in a study of self-disclosure in online communications, Joinson (2001) stated that, “. . . people disclose more information about themselves [online] compared to [face-to-face]” (General Discussion, ¶1). Other studies of blogging have also reported that students have used their blogs to share personal information (Brooks et al., 2004; Dickey, 2004).

## **Emotional Responses to Learning**

Students spent considerable time disclosing emotional responses to both their social and educational experiences. Wosnitza and Volet (2005) commented on the “impact of students' emotions on their motivation and further engagement in the learning process” (p. 461). Many of the blogs were used to express fear or anxiety regarding difficulty learning the new software or meeting deadlines. Students were able to invite supportive responses from other students and, in a few instances, students made offers of help in response to these posts.

The act of sharing these anxieties may allow others to gain some confidence from the realization that they are not the only one who is anxious about their college project. Several students commented that they found reading emotional responses, “motivating”, perhaps because the posts gave them encouragement that they too could complete a difficult task. Boud and Walker (1991) noted that, “by being aware of the emotional tone of our involvement, we can acknowledge feelings that will deepen or inhibit our involvement” (p. 19). Huffaker and Calvert (2005) offered another explanation for sharing anxieties, suggesting that, “perhaps there is a certain sense of empowerment in revealing thoughts and feelings without hiding behind a public mask” (Disclosure of Personal Information in Blogs, ¶2).

Fun and Wagner (2005) discussed ownership and freedom and note that, in blog-based virtual communities, tasks tend to be based on an individual’s needs and desires. The fact that all students edited the layout and general look of their blog, and posted on a wide variety of topics, is an indication of the control students exerted over their blogs. This sense of ownership may have provided students an outlet for their self-expression that they did not have in their regular educational activities. As Efimova and de Moor (2005) stated, weblogs “[empower] individual expression” (p. 1).

The quantity of affective responses found in the study and students’ apparent enthusiasm for blogging as described during the focus group discussions support the importance of emotional responses to learning. Lehman (2006) argued that “emotions are central to the manner in which we perceive, experience, and learn” (Emotion as Indispensable to the Perception of Reality, ¶7). Wosnitza and Volet (2005) also commented that “the importance of research on emotion arousal in general and online learning in particular is widely acknowledged” (p. 462). The importance of emotional expression in relation to learning, however, has only recently begun to be considered more seriously (Cleveland-Innes & Ally, 2004; Lehman, 2006).

## **Blogging for Instructional Purposes**

Students’ unfamiliarity with the medium of blogging may have limited most of their reflective posts to sharing what may be considered surface statements about their learning. In their posts, students noted specific tasks with which they were engaged or which software applications they used. Most posts, however, contained few details of a particular task, but rather simply noted the level of completion, or perhaps included a list of current tasks. These entries may be a result of both the students’ interpretation of the instructions they were given and the fact that they were not given further, or more specific, directions over the project timeline.

In sharing even these limited statements about their learning, students were offering a level of support to other members of the course. By providing a timeline of their activities in the journal-style entries, they offered other students an opportunity to gauge their own progress with the project by providing a guide, or a benchmark against which they could measure their work. Students commented that they felt they had benefited by writing and reading such posts, stating in the focus group discussions that the “content was very educational”, and that they had, “gained more knowledge” from blogging. Xie and Sharma (2005) concluded that blogging allows students to revise “the interpretation of an experience” (p. 839) and not only share their insights with others, but benefit from others’ insights. Such peer acknowledgement may also provide the students with confidence that their work is meeting an external standard set by the other students.

Exploring differences of opinion might lead to the “collective understanding” (Freeman et al., 2006, Introduction, ¶1) of a topic by allowing students to interact with others and “[revisit] some

of the materials . . . from different conceptual perspectives” (Spiro, Feltovich, Jacobson & Coulson, 1996). Only in a few instances, however, did students offer additional information, or question a particular statement and ask for further clarification. Furthermore, in only one instance did a student write a comment wherein she openly disagreed with a particular issue raised.

The finding that students seldom challenged ideas in their blogs is consistent with another study of online social interchange. Anderson and Kanuka (1998) also noted that “inconsistencies were left unchallenged” (Results, ¶15). Their explanation for this behavior was that “it is much easier to ignore or not respond to online messages that are incompatible with existing knowledge than it is in a face-to-face environment” (Discussion, ¶4). Writing responses and comments that demonstrate dissonance or disagreement with another person involves a certain level of risk and potential loss of face on the part of both participants. Students stated in the focus group that in certain cases they contacted other students directly to discuss something they saw in their blog rather than leave a comment. An additional factor accounting for the lack of statements of dissonance may be the fact that the students were working in a second language. Some may have lacked the linguistic ability to explain their position, and thus limited their replies to thanking each other for the posts and comments.

Anderson and Kanuka (1998) suggested that “it may also be possible that the construction of knowledge is not an observable activity” (Discussion, ¶5). One potential source for learning arises when students read others’ posts and compare them with their own experiences. The actual act of knowledge construction becomes an internal one where the students note differences and similarities between their thoughts and those of other students and then resolve such differences on their own. Garrison et al. (2000) note that when viewing the content of an online community or interaction, “observers view only that subset of cognitive presence that the participants choose to make visible” (p. 7).

The fact that students did not move beyond information sharing and did not engage in knowledge construction could also be related to the lack of teaching presence. In their community of inquiry model, Garrison et al. (2000) refer to teaching presence, which may be divided into three abilities: 1) the design of the educational experience, 2) the facilitation of that experience, and 3) subject matter expertise (Anderson, Rourke, Garrison, & Archer, 2001; Garrison et al., 2000; Garrison, 2006). Part of the intention of the blogging activity within the e-portfolio project was to simply let the students pursue the activity with minimal direction and see how they reacted. Students were given only limited direction and guidance in class time, and there was little teacher interaction in individual blogs. Other studies (Freeman et al., 2006; Hernandez-Ramos, 2004) also noted, in order to exploit blogs more fully, students may need to be supported with explicit requirements.

Anderson et al. (2001) suggested that a teacher is ideally a “subject matter expert who knows a great deal more than most learners and is thus in a position to ‘scaffold’ learning experiences by providing direct instruction” (p. 2). The instructors involved with the blogging activity did not provide direct instruction, or the subject matter expertise through the online community. Despite arguments that teaching presence can be provided by students as well as teachers, “interaction with instructors seemed to have a much larger effect on satisfaction and perceived learning than interaction with peers” (Garrison & Cleveland-Innes, 2005, p. 136).

## Conclusions

This study found that while students did use blogging for instructional purposes, their primary use of blogging was for social purposes. This study also confirms the conclusions of other studies (Lehman, 2006; Wosnitza & Volet, 2005), which have noted the importance of emotions in learning, particularly in contributing to the learner's ability to continue a task (Boud & Walker, 1991). Additionally, all students shared varying amounts of project-related information through blogging, which is the first step towards the social construction of knowledge. The authors hypothesize, however, that due to the lack of a strong teaching presence, there was only limited progression towards the discovery of dissonance, knowledge construction, and the establishment of a cognitive presence.

The participants willingly engaged in the blogging medium for the purpose of interacting with other students, as evidenced by efforts they made to express a social presence, including self-disclosure. In fact, self-disclosure was one of the most notable purposes for blogging in this study. Joinson and Paine (*in press*, p. 29) also note that: "Self-disclosure is one of the few widely replicated and noted media effects of online interaction." Joinson (2001) has also noted that self-disclosure is higher in online forums than in face-to-face situations.

Students also shared emotional responses to learning. They indicated in the focus group discussions that they were motivated to share their emotions because doing so provided them an outlet for frustrations. They also found motivation in the knowledge that they were not the only ones experiencing difficulties with the project.

The study also found that the distinction between social and instructional purposes is often not clearly defined. In many cases, students used blogging for social purposes, but since these purposes were highly motivating in terms of continuing to blog, there is a considerable overlap between social and instructional purposes.

In this study, only a limited teaching presence was established and the online community did not progress from a social purpose to a more instructional purpose. Garrison and Cleveland-Innes (2005) argue that for a community of inquiry to be viable, a strong teaching presence must first be established. It is this component of a community of inquiry that "provides the structure (design) and leadership (facilitation/ direction) to establish social and cognitive presence" (p. 144). This study confirms the argument that a teaching presence is an integral part of a community of inquiry, and must be established along with social presence before a cognitive presence can emerge.

Nevertheless, the students in this study were able to establish a social presence with only a limited teaching presence. While it is true that the students had varying degrees of success in establishing a social presence, all eight study participants did in fact do so, and in some instances, according to the criteria set by Rourke et al. (2001), students established social presence in their blogs.

## Implications

Fun and Wagner (2005) recommended that curriculum design incorporating blogs must be considered from the needs of the student rather than the institution. Our findings support this argument in part, in terms of the desire for students to express themselves socially and attract

attention to themselves. Students may also benefit from sharing their emotional responses to learning activities. Wosnitza and Volet (2005) commented on the “impact of students' emotions on their motivation and further engagement in the learning process” (p. 461). The degree of ownership students have over their blogs may provide them with an arena within which to share their emotional responses to their studies. Thus, it may also be suggested that blogging activities allow or encourage students to share such emotional responses, which potentially may increase their involvement in wider educational activities.

Self-disclosure and the establishment of a social presence was one of the primary uses of blogging for the eight students. Other studies have also found that self-disclosure is one of the most common forms of online communication (Joinson, 2001; Joinson & Paine, *in press*). Students showed that they are naturally inclined to disclose personal information, and found that this aspect of social presence encouraged greater involvement in the online community. Further research may reveal improved strategies for incorporating acts of self-disclosure into online community activities.

Students made considerable efforts to attract attention to their blogs. Although it is unclear what purpose the attention may serve in an educational context, there may be a connection between the issue of attracting attention and ownership. Anderson (2005) stated that the greatest benefit of the internet is the control it allows students over their learning. The ability of students to demonstrate ownership of their learning through their blogs is an area that might merit further investigation as it relates to blogging and learning.

Another possible explanation for the efforts students made with their blogs may be found in the concept of social capital, defined as the resources accumulated through interactions with other people (Ellison, Steinfield & Lampe, 2007). These resources may include a sense of reciprocity and trustworthiness between members of a social community (Kavanaugh, Carroll, Rosson, Zin & Reese, 2005). Further studies involving blogging in educational settings may want to consider how to obtain the greatest benefit from students' social purposes for blogging and enable students to “mobilize their social networks through technology when they need help” (Boase, Horrigan, Wellman & Rainie, 2006, p. v).

## Limitations

It is unclear how having mixed-gender classes might have affected the social presence and knowledge construction in which students engaged. The cultural setting of the study prevents most students from socializing outside of their college campus. This restriction may also have affected their purposes for blogging. The focus groups were conducted by a male. Given that all the students were female, cultural inhibitions may have also limited the amount and nature of information divulged by the students. The blogs were located on the open Internet. While the blogging software used in the study allowed students to control who could comment on their blogs, they could not control who viewed their blogs. This may have affected their purposes for blogging.

It is possible that working in a second language may also have affected their purposes for blogging. Since the focus group discussions were conducted in English, the students' second language, students may have been limited in their ability to express themselves. Interacting with others through blogging is not like interacting through discussion boards. Currently, interaction with others through blogging software is more cumbersome. Choosing another software package

such as a discussion board, or more flexible blogging software, may have provided different results.

Our study was conducted with post-secondary, first year college students, compared to many other studies which are conducted with graduate students (Betts & Glogoff, 2004; Efimova & de Moor, 2005; Freeman et al., 2006; Hernandez-Ramos, 2004; Xie & Sharma, 2005). The purposes for blogging and the emphasis on the social and instructional purposes may have been different if the group was in their second or third year. Although there were 266 blogs in the initial sample, only eight students met all of the criteria required for inclusion in the study. A larger sample would have provided a wider range of data and thus may have resulted in the identification of different purposes.

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# **Distance Education and Academic Achievement in Business Administration: The case of the University of Akureyri**

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## **Abstract**

This paper first presents the development of distance education in Icelandic universities. Its second aim is to present a detailed analysis of the distance education practice at the University of Akureyri (UNAK), Iceland. Finally, the paper aims at analysing academic achievement, as well as attitudes towards courses, among campus and distance students in business administration at UNAK. The research is based on secondary data from the university's information system and official statistics. The findings reveal that distance education has increased significantly in Iceland in recent years. UNAK has had a leading role in developing distance education at university level in Iceland. Nearly half the students at UNAK are enrolled in distance education. Females take longer to finish their study than males, but they receive higher grades than males. Distance students take up to a year longer to finish their BSc programme than campus students. The study also has shown that distance students tend to receive lower grades in business administration at UNAK, and they are older, on average, than local students. Finally, both groups of students seem to express similar attitudes towards taught courses within the faculty. More research is needed in order to fully understand the factors behind the different achievements of distance and campus students.

**Keywords:** Distance education; Iceland; business administration; student achievement

## **Introduction**

Education is highly valuable in a globalized knowledge society in which technological and social changes are rapid. In such a situation, education has an impact on people's employability and their inclusion in society.

Distance education has granted various groups of non-traditional students – such as people in rural communities, married couples with children, and people older than 25 years of age – access to educational institutions at university level. As a result, an ever-growing number of individuals are obtaining a university education through distance education.

Advanced information and communication technology (ICT) enables people to work and learn independent of time and space, so communities are no longer only based on geographical

proximity (Peters, 2007). For education, this has revolutionised teaching and learning where new technology enables the transfer and transmission of text, pictures, and videos free of the constraints of time and space. This has rapidly increased the number of university students as non-traditional students have entered the universities in many countries.

Student achievement and retention, however, has been found to be lower among distance learners than among campus students. This has been explained by various factors such as age, social class, and social situation – i.e., lack of support, isolation, etc. (Fozdar & Kumar, 2007). This fact still makes distance education an interesting research area, as the question of distance students' achievement and retention is far from settled.

The first aim of this paper is to provide insight into the development of distance education in Icelandic universities. Its second aim is to present a detailed analysis of the distance education practice at the University of Akureyri (UNAK), and, third, to analyse academic achievement and attitudes towards courses, among campus and distance students in business administration at UNAK.

The next section of the paper deals with theories of distance education, followed by a presentation of the methodology used. The fourth section provides information on distance education at UNAK, while the fifth presents the findings on student achievement and attitudes among students in business administration. The paper ends with a discussion and conclusions.

## **Literature Review**

There are many different definitions of distance education. Bernard, Abrami, Borokhovski, Wage, Wozney et al. (2004, p. 388) synthesize recent definitions and define distance education as:

- Semi-permanent separation (place and/ or time) of learner and instructor during planned learning events.
- Presence of planning and preparation of learning materials, student support services, and final recognition of course completion by an educational organization.
- Provision of two-way media to facilitate dialogue and interaction between students and the instructor and among students.

Research has been undertaken in order to evaluate student attitudes, dropout/ retention and academic achievement in distance education compared to traditional classroom teaching. Among many factors identified as reasons for poorer achievement and higher dropout rates of distance education compared to classroom education are boredom with courses, financial difficulties, lack of feedback and encouragement, perception of isolation, insufficient motivation, dissatisfaction with requirements or regulations and change in career goals (Bernard et al., 2004; Fozdar & Kumar, 2007; Woodley, 2004). Integration into the academic and social system may also be a case in point. According to the theory of Tinto, school dropouts tend to have lower commitment to the university social system due to nonconformity values or limited interaction with others in the college (Woodley, 2004). In Table 1, Woodley gives some examples of student and institutional characteristics that former studies have found that may influence students' progress.

**Table 1.** Examples of student and institutional characteristics that may influence student progress

Student characteristics	Institutional characteristics
Academic ability	Type of institution
Academic preparedness	Teaching standards
Family background	Subject taught
Educational aspirations	Student accommodation
Study habits	Library facilities
Expectations about college	Laboratory facilities
Financial status	Student counselling
Work status	Assessment procedures
Place of residence	Teaching methods
Other characteristics	Tutorial support

Source: Woodley, 2004, pp. 51, 53.

According to Woodley (2004) much of the former research on distance education has focused on students' characteristics (Woodley, 2004). In Iceland, for instance, distance students tend to be older than campus students, are working part-time or full time, have taken some years off from study, are more often than not married with children, and live at some distance from universities (Oskarsson & Edvardsson, 2007). Institutional research, however, is less common according to Woodley, but many issues related to institutional factors are relevant to explain student dropout or success. Among these are selective or open entry, qualifications of teaching staff, library facilities, and teaching methods and assessment.

Past research on the study outcomes of distance education compared to classroom teaching is not conclusive. Meyer (2004; 2002) argues that there is no statistically significant difference between the two groups. Bernard et al. (2004, p. 397) conclude their extensive meta-analysis of 232 studies by noting “. . . that some applications of [distance education] are far better than classroom instruction and some are far worse.” Comparing distance and local learning, however, is no easy task, and several factors may distort the comparison, leading to unreliable results that are of only limited use (Meyer, 2004). One of the most significant factors that may reduce the value of the comparison, or even render it useless, is the fact that distance students and campus students are different types of groups. Do these groups for example share similar age composition, gender proportions, and preparation? The risk is that the comparison is of no value, because two different things are being compared – for example, apples and oranges (Howell, Law & Lindsay, 2004).

## Research Methods

To answer the question whether the results of distance and local students were comparable, information relating to grades, courses, students' gender, and age was retrieved, extending over the years 2001-2007, from the *Stefania* database, which serves as the university's information system. Information was obtained for a total of 410 courses taught during this period. To restrict the sample size, only those courses were selected that had been taught at least twice in classroom and in distance education at the same time. Another criterion for selecting courses was that the number of students in each course was not below 20, and no less than seven students registered either in classroom or distance education. A total of 204 different courses fulfilled those requirements.

In order to improve the reliability of the survey, each taught course was examined individually. There are generally a larger number of registered students in each course than those who obtain a final grade, which should be taken into consideration when different groups of students are compared. There are many different reasons for students failing to complete courses however, and if this is not taken into account it may well distort the comparison (Howell et al., 2004). Should one, for example, include those who were registered for the course but did not in any way participate in the teaching? The authors, therefore, decided to limit the sample in each course to students who obtained a final grade. A *t*-test (Sanders & Roberts, 2000) was applied to check the potential difference between the following factors: the grades of distance and local students, the grades of males and females, the age of distance and local students in each course, and the age of males and females in each course. A chi-square test was applied to check whether the gender distribution of local and distance students was identical.

## **University of Akureyri**

The supply of distance education at Icelandic universities has grown rapidly, with new courses being added every year. One reason is the rising use of computers and the Internet in Iceland. In 2007, 91 percent of individuals used computers, and 91 percent used the Internet (Statistics Iceland, 2008a). At present, seven out of eight universities offer distance education of one type or another. In 2007, 17,570 students were registered at those universities, of which 2,776 (15.8%) were registered in distance education (Statistics Iceland, 2008b). The distance studies are carried out in different ways, either by means of teleconferencing equipment or via the Internet. Each university has its own variation of course organisation and the implementation of the distance programme.

The University of Akureyri is located in the largest town in Iceland outside the capital area. The town, which is also a regional centre, is located in the North-Eastern part of the country, and has about 17, 000 inhabitants. UNAK was the third university founded in Iceland. At that time in 1987, the other two were in Reykjavik, the centre of higher education in Iceland. Before UNAK was founded, all students from rural areas had to move to Reykjavik in order to receive higher education. Today, Reykjavik still occupies a dominating position within the university system, since 75.9 percent to 86 percent of students live or study in the capital area (Statistics Iceland, 2008b; 2008c) while 63 percent of the population live in the larger Reykjavík area. From the beginning, UNAK has been of great importance to Akureyri and the scattered provincial settlements of Iceland. Currently, the university has four faculties: the Faculty of Law and Social Sciences, the Faculty of Health Sciences, the Faculty of Education, and the Faculty of Business and Science. The state-funded university operates using an open access model, except in the Faculty of Health Science where numerous exclusionary clauses are used to select students after the first term.

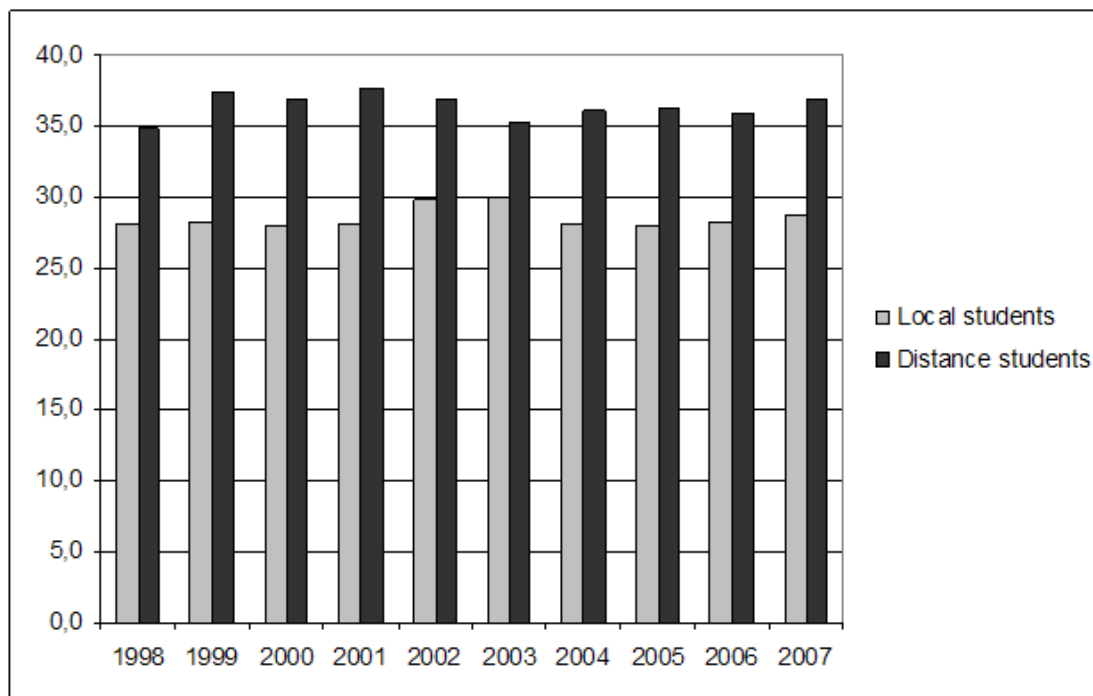
The University's student population has grown rapidly in recent years, as can be seen from Table 2. In 1998, the total number of students was 482, but it rose to 1,338 students in 2007 or 7.6 percent of all university students in Iceland. By far the largest increase was among distance students. The number of local students nearly doubled in the period, while that of distance students increased fifteen-fold. In autumn 2007, distance students were 48.1 percent out of 1338 students, and 22.8 percent of all distance students in Iceland. UNAK provided distance education to about 20 towns and cities throughout Iceland, transforming UNAK from a regional to a national university.

**Table 2.** Number of students at the University of Akureyri 1998-2006

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Local students										
Male	104	106	126	146	182	229	225	213	217	192
Female	335	358	366	405	452	603	547	567	546	502
	439	464	492	551	634	832	772	780	763	694
Distance students										
Male	12	21	27	98	97	120	138	131	121	136
Female	31	73	158	274	337	478	606	610	554	508
	43	94	185	372	434	598	744	741	675	644
Total										
Male	116	127	153	244	279	349	363	344	338	328
Female	366	431	524	679	789	1081	1153	1177	1100	1010
	482	558	677	923	1068	1430	1516	1521	1438	1338

Source: Stefania UNAK's information system

Table 2 also reveals that females comprise 75.5 percent of the total number of students, which can be explained by the fact that large faculties of UNAK are those of health sciences and education – i.e. providing education for traditional women's jobs, such as nursing and teaching.

**Figure 1.** The average age of students at UNAK 1998-2000

The majority of students at the university are relatively mature. In 2007, the average age of students was 32.6 years. When distance and local students are compared, it is found that distance students tend to be substantially older than local students (see Figure 1).

### Distance Education in Business Administration

The Faculty of Business and Science first offered distance studies in 2000. The program was initially developed as an on-campus program, and later adapted to distance education. This faculty has now the largest number of students within UNAK, as well as the largest share of distance students. Table 3 shows the number of students completing courses at the faculty over the past seven years.

**Table 3.** Number of students completing Faculty of Business and Science courses 2001-2007

	2001	2002	2003	2004	2005	2006	2007
Local students							
Male	111	139	115	96	103	107	132
Female	101	121	112	115	116	120	138
	212	260	227	211	219	227	270
Distance students							
Male	53	62	100	100	78	71	77
Female	74	94	152	172	187	195	190
	127	156	252	272	265	266	267
Total							
Male	164	201	215	196	181	178	209
Female	175	215	264	287	303	315	328
	339	416	479	483	484	493	537

Source: Stefania UNAK's information system

The Faculty of Business offers most of its courses concurrently to several locations in Iceland in subjects relating to business studies and natural resource science. Computer science, however, is not offered in distance mode. In the following, the focus will be on business administration.

A vast variety of teaching methods are used within the faculty. All teaching is organised around *WebCT*, where students can: (a) gain information on lecture schemes; (b) email the instructor and fellow students in their cohort; (c) participate in discussions by means of a discussion board; and (d) take quizzes, download overheads, access reading lists, and so on. Moreover, students can gain information on their assessment results in the grade book. Distance and classroom teaching, however, are separated. Classroom teaching is run from 8:00 a.m. until 12:00 noon most days, while distance education is undertaken in the evenings from 5:00 p.m. to 9:00 p.m., and during Saturdays (organised so that students can work along with their studies). Textbooks, reading materials, examinations, and assignments are the same for all students, independent of teaching methods, however.

Distance education in the business administration is organised as a group activity (i.e., it is set-up in cooperation with many learning centres throughout Iceland, where the students come to take part in lectures and discussions via interactive teleconference equipment supervised by a lecturer). In general, distance students have five meeting points, two hours at a time, for each



academic course in the study. New distance students to the faculty attend campus for a few days in the beginning of the first semester. Also, they visit UNAK every mid-term after that for a few days for lectures, course work, discussion, etc. The teaching model in business administration bears significant similarity to the fourth generation of distance education, The Flexible Learning Model, as shown in Table 4.

**Table 4.** Generations of Distance Education

<b>Generation</b>	<b>Model</b>	<b>Delivery technologies</b>
First generation	The Correspondence Model	Print
Second generation	The Multi-media Model	Print, audio tapes, video tapes, computer based learning (e.g. CML/CAL/IMA), interactive video (disk and tape)
Third generation	The Telelearning Model	Audio teleconferencing, videoconferencing, audio-graphic-communication, Broadcast TV/Radio
Fourth generation	The Flexible Learning Model	Interactive multimedia (IMM) online, internet based access to www resources, computer mediated communications
Fifth generation	The Intelligent Flexible	Interactive multimedia Learning Model (IMM) online, internet based access to www resources, computer mediated communications, using automated response systems, campus portal access to institutional process and resources.

Source: Fozdar and Kumar, 2007, p. 3.

## Student Progression

It is interesting to analyze the progression of the two groups of students within the faculty from start to finish. Table 5 shows the average number of semesters it took students to complete a bachelor degree in the years 2001-2007. Table 5 reveals that, in general, campus male students complete their studies in six semesters (i.e., three years). Females take about 0.5 semesters longer to finish their degree than males. Also, it is common that distance students graduate one year later than campus students (7.7-8 semesters). Table 5 shows that the difference in progression between campus and distance students is significant both between males and females and in general.

**Table 5.** The number of semesters students ( $N = 161$ ) require to complete bachelor degree in business administration

	Male	Female	All	p-value <sup>a</sup> between gender
Local students	6.1	6.6	6.4	0.018
Distance students	7.7	8.0	7.9	0.231
All	7.1	7.5	7.4	0.063
p-value <sup>a</sup> between local and distance students	<0.001	<0.001	<0.001	

<sup>a</sup>students t-test

## Comparing Teaching Methods

To compare the results of the two groups within the Faculty of Business and Science, 204 courses were examined, with student numbers ranging from 20 to 192, with an average of 61.1 students enrolled in each course. On average, each of those courses was completed by 27.9 local students and 33.1 distance students. When looking at the grades, it was found that local students had a higher average grade in 137 courses, compared to 67 courses where the distance students had a higher average grade. Using a 5 percent significance limit, 42 courses showed a significant difference between the grades of distance and local students – in eight of these the difference was in favour of the distance students. On the basis of a 1 percent significance limit, 20 courses showed a significant difference, always in favour of the local students (see Table 6).

**Table 6.** Proportion of courses showing a significant difference between student groups

Proportion of courses where local students have higher grades	16.7%
Proportion of courses where distance students have higher grades	3.9%
Proportion of courses where woman have higher grades	7,8%
Proportion of courses where men have higher grades	3,4%
Proportion of courses where distance students are of higher age	91,7%
Proportion of courses where woman are of higher age	13,7%
Proportion of courses where men are of higher age	0,5%

(5% significance limit).

In the courses investigated, the proportion of females ranged from 20 percent to 90 percent, with an average of 60.1 percent. Generally, the proportion of females was higher among distance students than local students. In 164 courses, the proportion of females among distance students was higher, and in 44 of those courses the difference was significant based on a 5 percent significance limit. The Faculty of Business and Science is the only faculty where it is possible to make an annual gender comparison. Females had a higher average grade in 119 courses, with a significant difference in 16 of those based on a 5 percent significance limit. Males, on the other hand had a higher average grade in 85 courses, although the difference was only significant in seven courses, based on a significance limit of 5 percent.

When considering the age composition of the students, the average age of local students is 27.5 years, compared to 36.2 years in the case of distance students. In 203 out of 204 courses, the average age of distance students was higher than that of local students; in 187 cases the difference

was significant, based on a 5 percent significance limit. Where the difference was significant, the distance students were on average 9.1 years older than the local students. The female's mean age was 32.5 years, compared to 31.2 years for males. The difference was significant 29 times, based on a 5 percent significance limit. Females were older in 28 cases, compared to males in one case.

When comparing the two groups, the distance students tend to receive lower grades than local students, they tend to be older (by 9.1 year), and include a higher number of females.

## Students' Attitudes

Former studies have noted that boredom with courses, as well as dissatisfaction with requirements, could explain poorer performance of distance students as compared to local students (Fozdar & Kumar, 2007; Bernard et al., 2004; Woodley, 2004). In order to analyze students' attitudes towards courses within the faculty, the assessment of courses given by students at the end of each semester was examined. Data for four semesters were retrieved from spring 2006 to autumn 2007. It was possible to compare the overall grade between local and distance students in 57 courses. In 36 instances, local students gave the course a higher score, while in 21 instances distance students gave the course a higher score. The difference was significant in 11 courses. Where the difference was significant, it is interesting to see that in six courses distance students gave the course a higher score, as can be seen in Table 7.

**Table 7.** Comparison of local and distance students' attitudes towards courses

	2006 Spring	2006 Autumn	2007 Spring	2007 Autumn
Number of courses to compare	11	17	13	16
Number of local courses with higher satisfaction	8	11	7	10
Number of distance courses with higher satisfaction	3	6	6	6
Number of courses with significant difference (0.05)	2	5	2	2
Number local courses with significantly higher satisfaction	1	3	1	0
Number distance courses with significantly higher satisfaction	1	2	1	2

Source: Stefania UNAK's information system

Interestingly, this shows that distance students and local students seem to be equally satisfied with courses within the faculty. They express similar attitudes towards taught courses within the faculty.

## Discussion

This paper presented research based on secondary data from a university's information system. The aim is to analyse academic achievement and attitudes of campus and distance students in the Faculty of Business Administration and Science at the University of Akureyri, Iceland. The findings reveal that it takes females longer to finish their studies than males, and that it takes distance students up to a year longer to finish their BSc programme than do campus students. The study also shows that distance students, on average, tend to receive lower grades and are older than local students.

Finally, both groups of students seem to be expressing similar attitudes towards taught courses within the faculty.

In the literature review, it was suggested that lower commitment, institutional factors, and students' characteristics are relevant in explaining student dropout and success. Two institutional characteristics stand out at UNAK in order to explain the success of distance and campus students. The first is the teaching methods; that is traditional campus teaching versus modified campus and online learning. As distance teaching is done, by in large, through teleconferencing and through some pre-recorded lectures, distance students have fewer contact hours with teachers than campus students.

The second factor is related to less tutorial support for distance students, as they have more difficulties to meet teachers, consultants, and support staff. This means that distance students experience more limited interaction with the social system at UNAK, and therefore lower commitment that could arguably lead to more dropouts. The cooperation with learning centres throughout Iceland is intended to increase interaction and group activity among distance learners.

The fact that females take longer to finish their studies is explained partly, at least in Iceland, by the fact that many females in university education give birth during their studies and assume primary responsibility for raising the children. More often than not, female students leave the university for a short period or undertake part-time studies. The age difference between distance students and campus students was assumed to be younger, because single people can move more easily between locations for the purpose of education, whereas older students are less mobile due to family or employment situations. As the distance programmes at UNAK are, in most cases, highly flexible, and many of the distance students are employed while studying, it generally takes them longer to complete their academic programmes.

High workload and family obligations, combined with university studies, is common practice among distance students in Iceland, and may explain their lower grades in part. Further analysis, however, is needed to evaluate the impact of distance education versus classroom instruction on the actual achievement of students.

The findings of this study with regard to poorer performance and longer study periods among distance students are in accordance with past research (Fozdar & Kumar, 2007; Woodley, 2004). Although gender and age have been mentioned briefly in the literature, those aspects have not been given the attention they deserve as explanatory variables, as our results indicate. Our findings –that there is no significant difference in attitudes towards taught courses among campus versus distance students – seem to contradict earlier research.

This research was carried out in only one faculty within one university in one country, and is based on a registration data (secondary data). Its results, therefore, should be interpreted with care. Future research is needed, as the subject under investigation is quite complicated. Future research should involve case studies and interviews, as well as surveys where students' backgrounds are analysed, as well as the character of the educational institutions with regard to potential impact on students' overall academic performance.

## **Conclusions**

The use of distance education has increased rapidly in recent years. Past research has indicated, however, that the achievement of distance students, in many cases, has been less satisfactory than

that of campus students. This holds consequence for both students and the community. Distance students may waste time, money, and energy in unfinished studies, or may realise poorer career possibilities due to lower grades. For the community, this could mean increased cost of education, as well as decreased potential skills and qualifications.

In order to address this problem, this paper first provides some insight into the development of distance education in Icelandic universities, and second, presented a detailed analysis of the distance education practice at the University of Akureyri. Finally, the main thrust of the paper has been devoted to the analysis of academic achievement, as well as attitudes towards courses, among campus and distance students in business administration at UNAK.

The findings reveal that it takes females longer to finish their studies than males, and that it takes distance students up to a year longer to finish their BSc programme than campus students. The study also has shown that distance students tend to receive lower grades, and, on average, that they are older than local students. Both groups of students seem to manifest equal levels of satisfaction with taught courses within the faculty.

In the paper, it is shown that distance education has greatly increased in Iceland in recent years. UNAK has had a leading role in the development of distance education at university level in Iceland. Nearly half of the number of students at UNAK is enrolled in distance education.

## Notes

No formal statistics is available at UNAK on succession rates of students. Such calculations are often complicated. In our case we followed the progression of those students that registered for the final year project, in all 161 students' progresses were analysed, but we were unable to follow the students that carried out part of their studies at other universities.

The assessment consists of an online questionnaire on the organization of courses, teaching facilities and materials, the performance of teachers, assignments, interaction between students and teachers, and so on.

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# **A Framework for Process Reengineering in Higher Education: A case study of distance learning exam scheduling and distribution**

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## **Abstract**

In this paper, we propose a conceptual and operational framework for process reengineering (PR) in higher education (HE) institutions. Using a case study aimed at streamlining exam scheduling and distribution in a distance learning (DL) unit, we outline a sequential and non-linear four-step framework designed to reengineer processes. The first two steps of this framework – initiating and analyzing – are used to initiate, document, and flowchart the process targeted for reengineering, and the last two steps – reengineering/ implementing and evaluating – are intended to prototype, implement, and evaluate the reengineered process. Our early involvement of all stakeholders, and our in-depth analysis and documentation of the existing process, allowed us to avoid the traditional pitfalls associated with business process reengineering (BPR). Consequently, the outcome of our case study indicates a streamlined and efficient process with a higher faculty satisfaction at substantial cost reduction.

**Keywords:** process reengineering; exam scheduling and distribution; distance learning.

## **Introduction**

Business process reengineering (BPR) is the analysis and design of workflows and processes within and between organizations (Davenport & Short, 1990). In spite of academics' often skeptical stance against BPR and other management concepts (Birnbaum, 1988), which may seem foreign to the organizational culture of higher education (HE), many universities have reengineered their internal processes. According to a recent study conducted by *Educause* (Kvavik, Goldstein, & Voloudakis, 2005), HE institutions have invested heavily in business process reengineering, leveraging information technology to improve services and reduce costs. This interest in rethinking processes and procedures is driven mainly by budget shortfalls, information technology infusion, and external pressures for greater accountability and responsiveness. Despite this enthusiasm and heavy investment from HE institutions however, few studies have examined the overall effectiveness and outcomes of reengineered processes. Additionally, with the exception of the above mentioned *Educause* study, Allen and Fifield (1999), and the work of Sepehri, Mashayekhi and Mozaffar (2004), Okunoye, Frolick and Crable (2006), and to some extent Penrod and Dolence (1992) and Belarmino and Canteli (2001), few studies have proposed a comprehensive framework to reengineer processes in HE environment. In this paper, we attempt to contribute to both aspects by proposing a conceptual and operational

framework for process reengineering in a HE environment, and by examining its effectiveness through a case study from a DL unit. This case study had two specific goals: (1) to replace a cumbersome and inefficient paper-based exam distribution and scheduling process with a Web-based streamlined and efficient process; and (2) to reduce the overall cost associated with mailing exams to/ from remote DL sites.

## **Process Reengineering Framework**

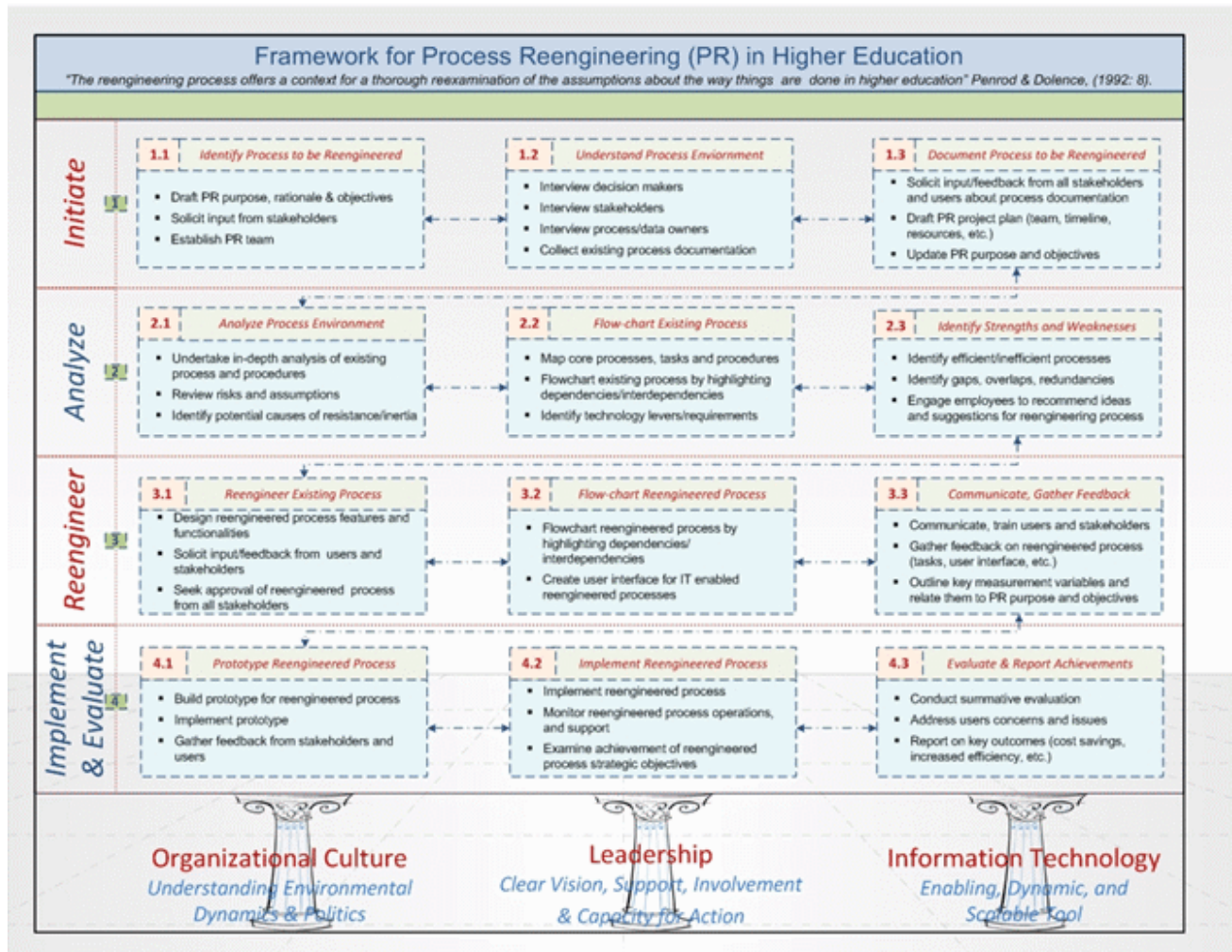
In their seminal work on BPR, Hammer and Champy (1993) are credited in the literature as defining reengineering as “the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical temporary measures of performance such as cost, service, quality, and speed” (p. 46). Closer to the organizational culture of HE, and prior to the Hammer and Champy work, Penrod and Dolence (1992) defined reengineering as “using the power of modern information technology to radically redesign administrative business processes in order to achieve dramatic improvements in their performance” (p. 8). From these two definitions, we understand that the ultimate goal of process reengineering is to achieve efficiency and effectiveness by radically rethinking existing processes; whereas the goal of total quality management is to undertake process change gradually by working in incremental steps (O’Neill & Sohal, 1999).

One of the corollary outcomes of BPR’s pursuit of efficiency and effectiveness often is translated into staff reduction and downsizing. By injecting new ways of doing things, BPR provides the opportunity to senior leadership to reduce staff and to reshape the organizational culture, as reflected in its values, norms, guidelines, and expectations, (Schein, 2004).

Following the BPR perspective, we designed a framework inspired by two main sources: (1) a retrospective analysis of our own experience in reengineering several internal processes, such as faculty development program management (Abdous, 2005), a syllabus creation process (Abdous & He, 2006), and learning assessment lab registration; and (2) the BPR literature (Davenport & Short, 1990; Macintosh, 2003, O’Neill & Sohal, 1999; Ahmad, Francis & Zairi, 2007). By combining two sources in which theory has been nurtured by practice, our framework provides a well grounded tool to use when reengineering processes in HE. As shown in the following figure, our framework is structured around four sequential and non-linear phases.



Figure 1. Proposed process reengineering framework



These four sequential and non-linear phases are:

- **Initiation.** This phase is aimed at identifying and understanding the purpose, the rationale, and the objectives of the process review (PR). This phase requires active participation from all stakeholders to document and to understand the environmental dynamics and the risks associated with the proposed reengineering process (den Hengst & de Vreede, 2004).
- **Analysis.** This second phase involves an in-depth analysis of the process tasks and procedures by analyzing tasks, reviewing risks and assumptions, and by identifying potential causes of resistance and inertia. With the documentation obtained during phase one, the outcome of this analysis phase is used to flowchart the process. A visual presentation of the existing process dependencies and interdependencies is not only critical to mapping the core tasks and procedures of the process, but is also foundational for the reengineering process itself.

- Reengineering. This third phase is intended to design the features and functionalities of the reengineered process, and includes active participation and feedback from all appropriate personnel and users. As the process is redesigned, the flowchart outlined in phase two is updated to include a clarification of the key measurement variables. In this phase, information technology is used as an enabling and facilitating tool.
- Implementation and evaluation. The implementation and evaluation phase is intended as a first step to prototype the reengineered process, thus addressing users' and stakeholders' issues and concerns. In a second step, the reengineered process is fully implemented and monitored to ensure successful operation. A summative evaluation is conducted, and achievement and outcomes are reported.

Successful implementation of this framework requires three key pillars: (1) a deep understanding and familiarity with the organizational culture and its dynamics and politics (den Hengst & de Vreede, 2004), (2) a clear vision, involvement, and support from senior leadership (O'Neill & Sohal, 1999) sustained by a "capacity for action" (Greenwood & Hining, 1996), and (3) the intelligent leveraging of information technology as an enabling, dynamic, and scalable tool (Ahmad, Francis & Zairi, 2007; Kohli & Hoadley, 2006).

## Process Reengineering Framework Application

Our case study was conducted at a moderately sized, urban, public, doctorate awarding, research university. Despite the fact that, in recent years, the university's delivery modes have been expanded to include two-way video, Internet, CD-ROM, and synchronous video streaming, the majority of its distance courses still are delivered using interactive television. Between Summer 2006 and Summer 2007, 593 instructors taught 1,281 courses, totaling 37,668 registrations. With numbers this high, material distribution and paper-based exam scheduling logistics can be challenging and sometimes overwhelming (Abdous & He, 2007). Indeed, in addition to burdening faculty with numerous paper-based forms for each exam given, this manual approach created tracking, processing, and retrieving problems for the DL staff. In short, the submission of paper forms was costly, cumbersome, and inefficient, and made tracking and managing difficult. To address these issues, a Web-based solution was designed, following the four step framework outlined above.

### 1) *Initiation*

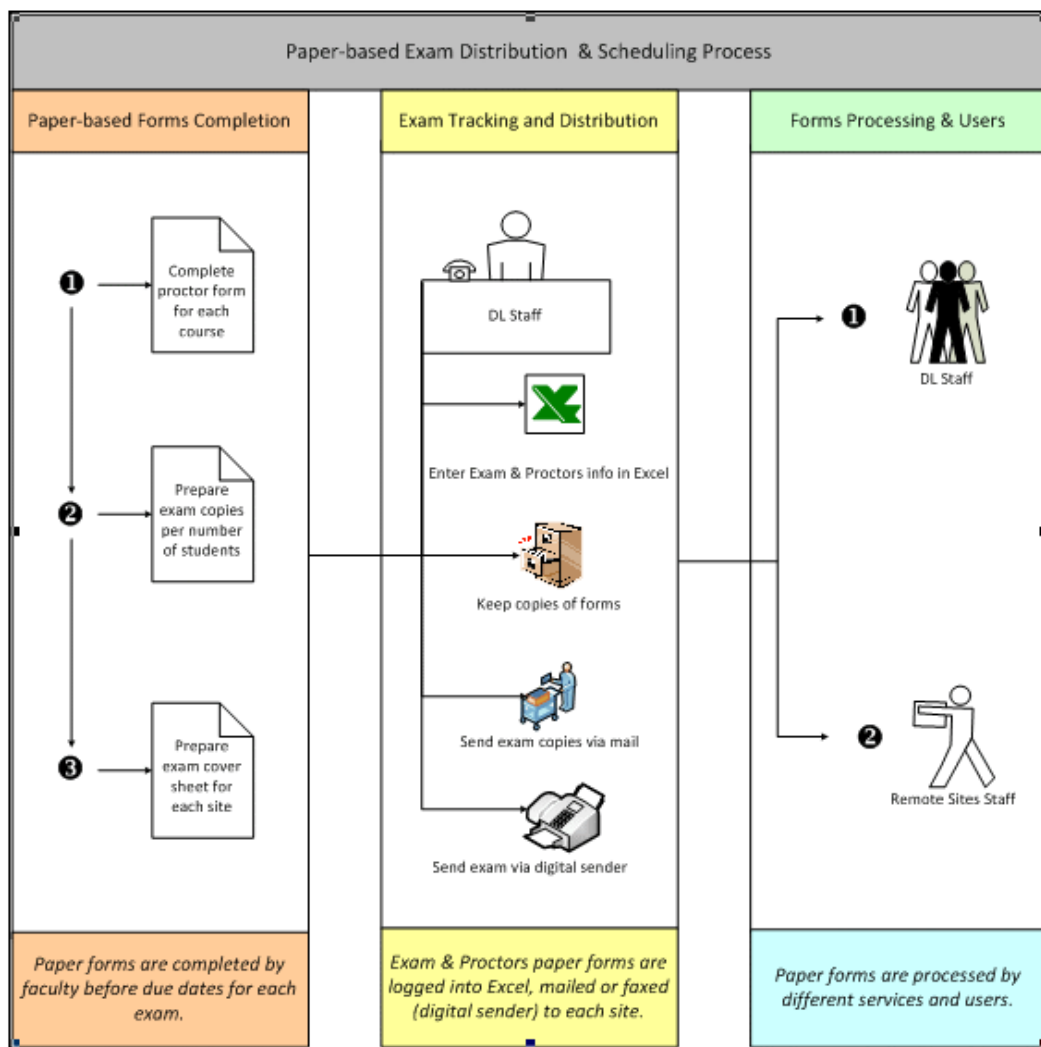
In this phase, we identified the exam scheduling and distribution process to be reengineered from the perspective of our unit's years of experience in dealing with exam scheduling and distribution for DL courses' material and exams. We established our understanding of the process by reviewing a variety of sources – including original paper reports, manuals, and forms – and by interviewing current staff and administrators in DL and, perhaps more importantly, faculty members teaching DL courses. Although nowadays a large number of objective exams are conducted using course management systems such as *Moodle*, the majority of televised courses exams, essays, and papers still are conducted and managed traditionally in a classroom environment using paper and pencil.

After observing the exam scheduling and distribution processes used in our DL unit, we conducted a series of meetings with related stakeholders in order to cultivate a supportive environment, get their feedback, and document the process to be reengineered. During multiple meetings, we established a development team; drafted a project plan; and defined team roles, accountability, expectations, and timelines in order to facilitate project management.

## 2) Analysis

In this step, we conducted an in-depth analysis of the tasks and procedures involved in the exam scheduling and distribution process. In-depth evaluations and analysis of the current paper-based exam scheduling and distribution approach were made and artifacts were collected. As a result, we flowcharted the existing process (see Figure 2) and identified a list of issues and problems which needed to be addressed. The team met many times, reached an agreement, and made recommendations for the reengineered process which included new features, functionalities, requirements, and ideas.

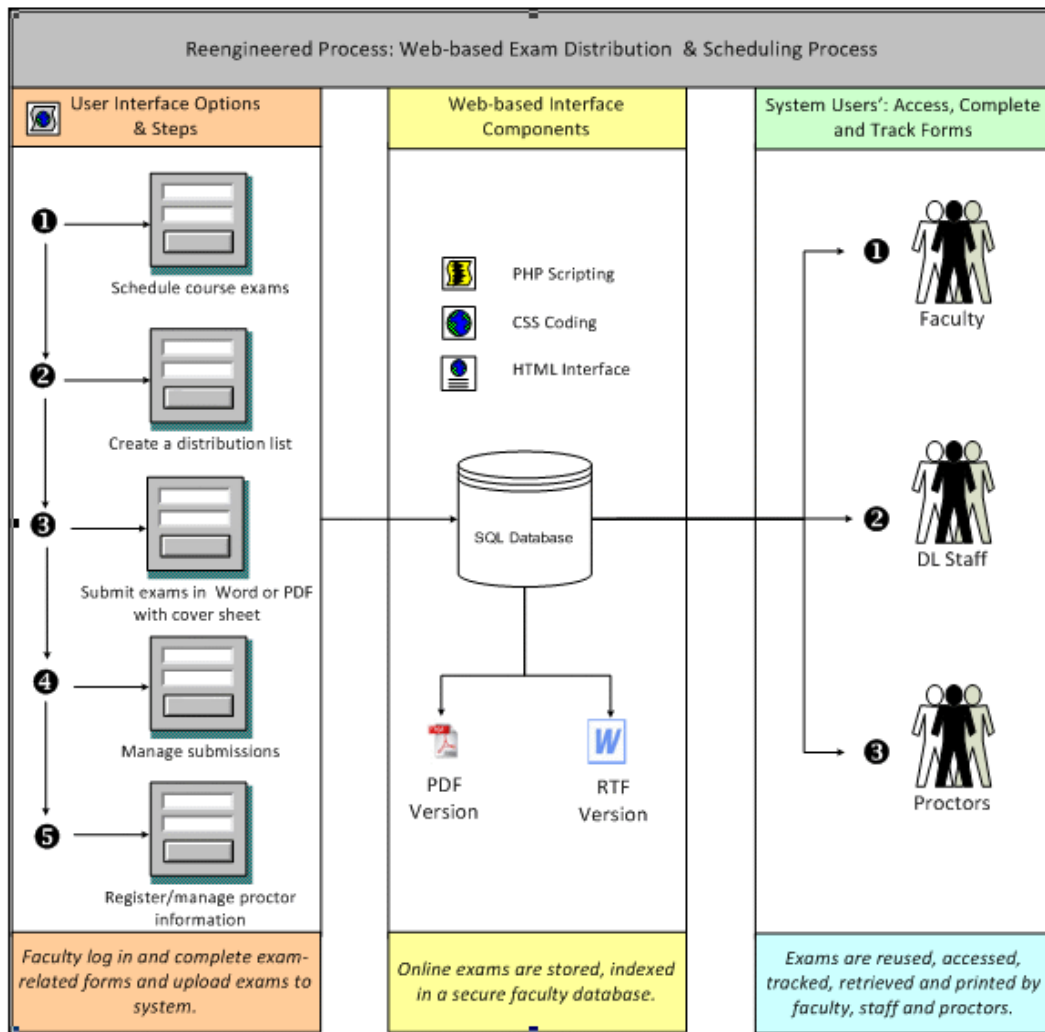
**Figure 2.** Paper-based exam distribution and scheduling process



### 3) Reengineering

In this step, we designed the features and functionalities of the reengineered process. Specifically, we flowcharted the reengineered process and conducted a system conceptual design and an interface design. We developed a conceptual model of the phases, tasks, and functions, and then created a “database-related entity-relationship” diagram (see Figure 3). Subsequently, we formalized this conceptual design by creating a Web-based user interface involving all system users. This participative approach during the design phase enabled us to capture users’ concerns and feedback early in the process, and to reach a consensus as to the workability of the reengineered process.

**Figure 3.** Web-based exam distribution and scheduling process



During the reengineering process, an instructional designer, two instructional technologists, and an interface designer were involved in the actual system programming and development. The system is a database driven environment intended to streamline the exam related forms

management process. To deploy the system on the Web, a *Microsoft MSSQL* server was used as the backend database environment. It was chosen because of its rich capabilities in supporting the required functionalities. PHP was used as the scripting language in order to create dynamic Web content by querying the database. Cascading Style Sheets (CSS), a common style sheet language for webpages, was used to ensure the overall consistency of the system's look and feel. A user account authentication system maintained by the Center for Learning Technologies was used to prevent unauthorized access to the online form services, thereby enforcing the security of the application.

## **Reengineered Process Features and Steps**

The reengineered process allows for access by three types of users: faculty, DL support staff, and proctors (people appointed to supervise students at an examination). On the faculty accessed portion of the site (see Figure 4), faculty members are able to accomplish the following tasks/steps:

**Step 1:** Schedule course exams. Faculty members schedule all of their exams for the entire semester and indicate whether or not they will need a proctor.

**Step 2:** Create a distribution list. Faculty members create their course's distribution list, which is used to send/ return exams or course related materials to the remote sites. This list also is used to notify remote sites' staff of any schedule changes. It is worth mentioning at this juncture, that before this process was reengineered, the list was entered manually for each site. With the reengineered process, the system fills in the data using an automated report process from the university data system.

**Step 3:** Submit exams. Faculty members upload their exam documents in Word or PDF format. To maintain cross platform consistency, Word documents are converted to PDF format. Using a generated distribution list, instructions, cover sheets, and exams are emailed to the remote sites' staffs, as well as to faculty and proctors.

**Step 4:** Manage submissions. Faculty members are able to modify and/ or update exam information and schedule or update distribution lists. DL staff and proctors are notified of any changes.

On the staff side, DL support staff members are able to track the course exams and material by course name and date, and can monitor and respond to course and exam modification requests from faculty. Staff members also can submit course and exam modification requests to remote sites on behalf of faculty members, as needed.

**Figure 4.** A Web-based exam distribution and scheduling process interface

Course	Title	Exam Date	Start Time	End Time	Date Created	Received	Options	Type
No items exist in your profile								

On the proctor page, a request form for DL students and a proctor agreement form also are available online. DL support staff members are able to track and approve the proctor request and agreement information.

#### ***4) Implementation and evaluation***

The development team adopted a rapid application development approach (Robinson, 1995) in building the system. Based on the entity relationship diagrammed in Step 3, we designed a database using a *Microsoft SQL* server, followed by a shared login/ authentication module. After that, we created a separate module including access privileges and features for each user. These modules then were integrated into a fully functional system. The user features and functions were prototyped and tested with real data several times prior to the actual use of the system. The system (see <http://www.clt.odu.edu/mdf/>) has now been through multiple iterations of revision, based on feedback collected from all users.

#### ***Evaluation of the Online Exam Scheduling and Distribution System***

The online system has been up and running since the fall semester of 2006. To capture firsthand faculty feedback and to explore their overall satisfaction with the usability of the system, a Web-based survey was administered to all faculty members using the system. The intent of the survey was twofold: (1) to understand how faculty members were using the system; and (2) to examine the impact of the system on reducing faculty workload. The collected data is also expected to inform future development and research on the system.

A quick analysis of the data indicates that 32 faculty members representing various disciplines and colleges (out of 150 users) completed the survey. The instrument contained five items that could be responded to on a 5-point Likert-type scale (see Table 1) and also contained an open ended question asking participants to recommend specific system improvements. Descriptive statistics were used to analyze the rating scale and a content analysis of faculty answers was conducted to catalog the open ended questions.

**Table 1.** Overall faculty satisfaction with the exam scheduling system

"

<i>Dimensions</i>	<i>Strongly agree</i>	<i>Moderately Agree</i>	<i>Neutral</i>	<i>Moderately Disagree</i>	<i>Strongly Disagree</i>
Has all of the functions and capabilities I expect-it to have	21%	33%	15%	18%	6%
Enables me to accomplish tasks more quickly	30%	24%	12%	18%	9%
Easy to use	12%	39%	18%	21%	6%
Reduces my time and effort in managing exam schedules and distribution to DL students	18%	24%	21%	12%	15%
Makes it easier to meet submission deadlines	27%	33%	15%	6%	12%

Using a 5-point scale ranging from 1(*low*) to 5 (*high*), participants rated their comfort levels about using computers and the Web. Their average comfort level was 4.06 with computers and 4.37 with the Web. Overall, approximately 51 percent of the participating faculty members indicated that the system was easy to use. Their feedback indicates that the system (1) enables them to accomplish tasks more quickly (54%); (2) reduces time and effort in managing exam schedules and in distribution to DL students (42%); and (3) makes it easier to meet submission deadlines (60%). The results presented in Table 1 suggest that many faculty members have a positive attitude about the system. As the system remains an ongoing process and is not integrated with other university systems, such as the university registration system, faculty members must create a new account to access the system. To some degree, the account issue has contributed to the dissatisfaction of some faculty with the system.

The survey results also reveal some difficulties in the faculty's use of the system, as well as some opportunities for the DL staff to improve the system. Approximately 43.75 percent of the faculty members participating in the survey indicated that the system requires more functions and capabilities. Approximately 65.63 percent indicated that they needed assistance in using the system. Some faculty recommendations include:

- Include a short video on how to use the system.
- Integrate with other university systems.
- Convert uploaded Word files automatically into PDF files for exams to avoid version inconsistency.
- Email the receipts from the various sites to the faculty after the exam submission,
- Email reminders to faculty members who do not submit the exam as scheduled.

In response to these recommendations, we purchased software to automatically convert Word files into PDF files on the server side (without human intervention). In addition, the system now sends an automatic email receipt to faculty after each exam submission. In the same way, the

system reminds faculty members of their schedule deadlines. An audio/ video tutorial is planned for implementation later this year, after our second round of evaluations.

Although cost/ benefit analysis is traditionally required to demonstrate cost savings in BPR projects, we decided to report cautiously that our project generated direct and indirect cost savings. Our unit accounting office calculated the annualized cost saving attributed to the reengineered system at US \$7,500, which accounts for eight percent of the mailing budget. This estimate included direct costs associated with mailing charges only. We expect this percentage to increase once all DL faculty members are using the system. In indirect cost saving, the new functionalities of the system freed faculty and staff from clerical and time consuming tasks. We assume that this workload reduction likely will contribute to increased faculty and staff productivity.

In brief, despite a slight resistance from staff, which is typical of BPR implementation building around any legacy system, we believe that we achieved our stated goals of: (1) replacing a cumbersome and inefficient paper-based exam distribution and scheduling process with a Web-based streamlined and efficient process; and (2) reducing both the faculty/ staff workload associated with the clerical tasks of scheduling exams and the overall costs associated with exam distribution.

## **Conclusion and Future Work**

In this paper, we have presented an online exam scheduling and distribution system for DL courses. The system plays an essential role in facilitating coordination and communication among the stakeholders involved in the exam scheduling and distribution process. Further improvements are planned to integrate the system with university registrar data systems. This integration will increase automated tasks and reduce faculty need to input student and course data. In addition, we are examining how to help faculty manage graded exam and paper collection and distribution.

In summary, drawing from BPR research and from our own experience in redesigning processes, our proposed framework offers a flexible roadmap to rethink, redesign, and streamline the exam scheduling processes. Our operational model is rooted in the organizational culture of HE, and actively engages all stakeholders to undertake an in-depth analysis and take ownership of the reengineering process. Our application of the framework has enabled us to uncover inefficiencies, reduce paper handling, increase efficiency, and achieve operational improvements while reducing faculty workload and reducing overall cost. We believe that our framework will be used to identify and streamline other services and will be of assistance to other universities' DL efforts.

## **Acknowledgments**

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# **Meta-Analysis: The preferred method of choice for the assessment of distance learning quality factors**

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## **Abstract**

Current comparative research literature, although abundant in scope, is inconclusive in its findings, as to the quality and effectiveness of distance education versus face-to-face methods of delivery. Educational research produces contradictory results due to differences among studies in treatments, settings, measurement instruments, and research methods. The purpose of this paper is to advocate the use of a meta-analytic approach by researchers, in which they synthesize the singular results of these comparative studies, by introducing the reader to the concept, procedures, and issues underlying this method. This meta-analytic approach may be the best method appropriate for our ever-expanding and globalizing educational systems – in general, crossing over geographical boundaries with their multiple languages, and educational systems in particular. Furthermore, researchers are called to contribute to a common database of distance learning factors and variables, from which future researchers can share, glean, and extract data for their respective studies.

**Keywords:** Distance Learning; Meta-Analysis

## **Introduction**

*"I had hoped to find research to support or to conclusively oppose my belief that quality integrated education is the most promising approach. For every study that contains a recommendation, there is another, equally well-documented study, challenging the conclusions of the first...No one seems to agree with anyone else's approach. But more distressing: no one seems to know what works." Senator Fritz Mondale (Bangert-Drowns & Rudner, 1991).*

U.S. Senator Fritz Mondale's quote (true then as it is today) illustrates a common plight: Current comparative research literature, although abundant in scope, is inconclusive in its findings, as to the quality of distance education versus face-to-face methods of delivery.

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Furthermore, educational research often produces contradictory results due to differences among studies in treatments, settings, measurement instruments, and research methods, leading to the point where research findings are difficult to compare, and may become so extensive as to obscure trends with an overwhelming amount of information.

This problem has now been intensified by the telecommunication revolution of the 1990s and 2000s that has also boosted the proliferation of DL, opening local and international geographical boundaries, allowing schools to offer their academic programs to a diverse and growing potential student body. It is therefore obvious, that the assessment of this diverse and international boundary-less trend and its academic outcomes should require undertaking new directions that can encompass said enhanced change of scope.

It may be that there is an answer to this dilemma, should researchers adopt a meta-analytic approach, in which they synthesize the singular results of these comparative studies. The purpose of this paper is to advocate the use of Meta-Analysis (MA) by introducing the reader to the concept, procedures, and issues underlying this method. It should be noted, that the meta-analytic approach may be the best (if not the only) method appropriate for our ever-expanding and globalizing educational systems – in general, crossing over geographical boundaries with their multiple languages, and educational systems in particular.

### **DL Assessment: The current research problem**

Although a substantial body of research on distance education (DE) academic outcomes was conducted and compiled in the 1990s-2000s, it seemed to conclude that distance education outcomes were not that different from those achieved in traditional classrooms (DeSantis, 2001; Phipps & Merisotis, 1999; Russell, 2002). On the other hand numerous research studies present results that show a different picture and conflict with the conclusions cited above, creating a mixed and confusing situation (Dellana, Collins, & West, 2000).

It should be explicitly noted, that the abundance of research conducted, has not passed with out controversy and debate within the academic community. Phipps and Merisotis (1999) provided a 'collective' problem definition: The most significant problem is that the overall quality of the original research is questionable and thereby renders many of the findings inconclusive, pointing out the major drawbacks and key shortcomings of the research: (a) Much of the research does not control for extraneous variables and therefore cannot show cause and effect; (b) Most of the studies do not use randomly selected subjects; and (c) The research focuses mostly on the impact of individual technologies rather than on the interaction of multiple technologies.

The most frequently asked and researched questions regarding comparisons between DE and traditional education pertain to the *quality* of instruction and learning, the *cost* of attendance, the *needs* of the "characteristic or average" DE student, Student satisfaction towards DE, and a comparison of the factors affecting the instructional efficacy and student learning in both situations. A caveat to note is that DE is not uniform in its delivery and utilizes various instructional methods (synchronous and a-synchronous), and technologies (CD and Internet based instruction, one/ two way audio and visual interactions, etc.), leading to the usage of very broad measures to examine the effectiveness of DE.

Although, there are numerous independent studies pertaining to DE recorded in the literature, we also can see the recurring appearance in recent years of secondary data analyses in many DE related fields, of which I will point out but a few: Zhao and colleagues (2005) in their meta-

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analytical study of research on distance education identify factors that affect the effectiveness of distance education, and report that DE programs, vary a great deal in their outcomes to be associated with pedagogical and technological factors; Williams (2006) focuses on the effectiveness of DE in allied health science programs, by conducting a meta-analysis of student achievements and reports that open learning and synchronous instruction were the most effective distance education models of instruction; Sitzmann, Kraiger, Stewart and Wisner(2006) compared the effectiveness of Web-based and classroom instruction by means of a meta-analysis and further examined the moderators of the two delivery media; Saba (2000) provides a status report past and current on research trends and methods in distance education; Glenn, Jones and Hoyt (2003) compared differences from multiple studies between web-mediated versus traditional delivery in terms of the impact on student learning and satisfaction; and Allen, Bourhis, Burrell and Mabry (2002) compared student satisfaction with DE versus traditional classrooms in the higher education arena by means of a meta-analysis.

### **Effect Size and Meta-Analysis: The conceptual and practical solution**

Consequently, many researchers advocate the ‘refining’ of these “broad” measures and variables, further debating and arguing that in terms of statistics, null-hypothesis testing should be eliminated altogether, advocating alternatives in future research that should focus on effect size to the extent that reporting them should be ‘mandatory’ (Lockee, Burton & Cross, 1999; Thompson, 1996).

Educational measurement in general would benefit greatly, should researchers adopt: (1) The practical usage of comparative effects sizes in their studies, in general, and (2) The synthesizing of these effect sizes by means of a meta-analysis, in particular.

The ‘acceptance of the Glassian meta-analysis concept,’ and the ‘implementation of meta-analytic procedures in research,’ provide a feasible answer and solution to this plight (as, meta-analysis is the application of statistical procedures to collections of empirical findings, from individual studies for the purpose of integrating, synthesizing and making sense of them (Bangert-Drowns & Rudner, 1991; Becker, 1998; Cook, Heath & Thompson, 2000; Heberlein & Baumgartner, 1978; Lemura, Von Duvillard & Mookerjee, 2000; and Niemi, 1986).

As in many other fields, the concept in itself, does not promise accurate or true results. It is the strict adherence to the procedures, and systematic treatment and analysis of the data, which will ensure acceptable statistical findings.

It seems appropriate, that an honest and professional effort be exerted to find ‘common ground,’ and a ‘common denominator’ between all relevant educational measurements in general, and learning outcomes in particular. One of the benefits and advantages of conducting meta-analysis, is that it ‘gives a voice’ to ‘small and distinct’ studies, each one in itself not strong enough to qualify as being statistically significant, or robust enough to warrant serious consideration. But ‘integrated together,’ can contribute their findings to the ‘big picture.’

### **Definitions**

**Meta-Analysis (MA):** A collection of systematic techniques for resolving apparent contradictions in research findings; Meta-analysts translate results from different studies to a common metric and statistically explore relations between study characteristics and findings; A

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meta-analysis on a given research topic is directed toward the quantitative integration of findings from various studies, where each study serves as the *unit of analysis*; The findings between studies are compared by transforming the results to a common metric called an effect size (ES)” (Bangert-Drowns & Rudner, 1991; Becker, 1998; Cook, Heath, & Thompson, 2000; Lemura, Von Duvillard, & Mookerjee, 2000).

**Effect Size (ES):** Comparison in terms of a standard, i.e. a ‘standardized difference’ denoted by the symbol ‘*d*’; the mean difference between groups in standard score form - the ratio of the difference between the means to the standard deviation (Yu, 2001).

The logic of calculating ES is that researchers should be concerned with not only whether a null hypothesis is false or not, but also how false it is (When the President asks the five-star general to estimate the war casualty, can he give "not zero" as a satisfactory answer?), i.e., if the difference is not zero, how large the difference one should expect? By specifying an effect size, which is the minimum difference that is worth research attention, the researcher could design a study with optimal power rather than wasting resources on trivial effects. The larger the effect size (the difference between the null and alternative means) is, the greater the power of a test is (Yu, 2001).

## **Meta-Analytic Approaches**

Within the field of meta-analysis, we have different approaches as to their procedures, computations, and interpretation of results. It is most important that the researchers explicitly point out which was implemented within their respective studies. For the purpose of this paper, only the Glassian and Study MA will be discussed:

- **Classic or Glassian Meta-Analysis** – Glass’ early meta-analyses set the pattern for conventional meta-analysis: define questions to be examined, collect studies, code study features and outcomes, and analyze relations between study features and outcomes. Features: (1) ‘classic’ meta-analysis applies liberal inclusion criteria; (2) the unit of analysis is the study finding. A single study can report many comparisons between groups and subgroups on different criteria. Effect sizes are calculated for each comparison; (3) meta-analysts using this approach may average effects from different dependent variables, even when these measure different constructs. Glassian meta-analysis has proven quite robust when submitted to critical re-analysis.
- **Study Effect Meta-Analysis** – Study effect meta-analysis alters the Glassian form in two ways: (1) inclusion rules are more selective. Studies with serious methodological flaws are excluded; and (2) the study is the unit of analysis. One effect size is computed for each study.

## **Meta-Analysis: Process and Procedures**

The MA required processes and procedures will be presented as implemented by the author (Shachar, 2002) in detail, and by other researchers (Cavanaugh, 2001; Bernard et al., 2004; Machtmes & Asher, 2000; Cavanaugh et al. 2004; and Jahng et al., 2007) in general, all having

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conducted comparative DE versus Traditional education meta-analyses with students' academic achievement as their dependent variable (see Table 1).

**Table 1.** Meta-Analyses in Recent DE Research

	Shachar	Cavanaugh	Bernard et al.	Machtmes & Asher	Cavanaugh et al.	Jahng et al.
Publication Year	2002	2001	2004	2000	2004	2007
Topic	Differences between traditional and distance learning outcomes: a meta-analytic approach	Academic achievement of K-12 students	How does distance education compare to classroom instruction? A meta-analysis of the empirical literature	A meta-analysis of the effectiveness of telecourses in distance education	The Effects of Distance Education on K-12 Student Outcomes: A Meta-Analysis	Student Achievement in Online Distance Education Compared to Face-to-Face Education
Time frame	1990-2002	1980-1998	1985-2002	1943-1997	1999-2004	1995-2004
Dependent variable	academic achievement	academic achievement	academic achievement	academic achievement	academic achievement	academic achievement
N of studies	86	19	318	19	14	20
N of subjects	15,346	929	54,775		7,561	1,617
ES	+ 0.366	+ 0.015	+ 0.013	- 0.009	-0.028	+ 0.023

## Procedures

In general, the procedures for conducting a meta-analysis were suggested by Glass, McGraw, and Smith (1981). Their approach requires a reviewer to complete the following steps: carry out a literature research to collect studies; code characteristics of studies; calculate effect sizes as common measures of study outcomes; and search for relationships between study features and study outcomes. The following sections provide an enhancement of these broad requirements and explain (as 'painlessly' as possible) each methodological step and decision needed to be undertaken in a MA study:

**Step 1: Defining the Domain of Research** - The IV is the method/ mode of delivery, operationalized as: (1) Distance education mode and (2) The traditional mode. The commonly researched variables are of the factors pertaining to the quality/ effectiveness of distance learning programs: academic performance; student attitudes; student satisfaction; student cognitive learning and evaluation of instruction. In Shachar (2002) - the factor and DV is Final Academic Performance. Note: the researcher must ascertain that the DV is the same across all studies.

**Step 2: Criteria for Including Studies in the Review: Criterion 1** – The time period to be covered in the review. In Shachar (2002) 1990 – 2002; **Criterion 2** – Published / Unpublished studies. In Shachar (2002): Both types were included; **Criterion 3** – The quality of a study. In Shachar (2002): Only studies showing no severe methodological flaws were included; **Criterion 4** – Control group - Each primary study should have a control or comparison group. This is

‘essential,’ as we are calculating the effect size, which is the: “mean difference between groups in standard score form; **Criterion 5** – Sufficient Quantitative Data presented in the studies, e.g. sample size, mean and standard deviation, from which effect sizes can be calculated.

**Step 3: Determining the Type of Effect Size to Use** – As different statistical methods exist for combining data, with no single ‘correct’ method (Egger, Smith, & Phillips, 1997) one can choose between and/ or assess the appropriateness of two ‘popular’ approaches for mean comparison: (a) Glass, McGraw & Smith (1981) developed the basic formula for the effect size as: ‘The mean of the experimental group ( $Me$ ) minus the mean of control group ( $Mc$ ), divided by the standard deviation of the control group’, or (b) Hunter and Schmidt (1990) suggesting using a ‘pooled within-group standard deviation’ and ‘corrected the effect size’ for measurement error.

Hedges and Olkin (1985) have laid the foundation for estimating the ‘ $g$ ’ effect size: Modified Glass statistic with *pooled* 1 sample standard deviation:

$$g = \frac{Me - Mc}{\sigma_{pooled}}$$

and correcting its sample bias to obtain the unbiased estimator 2 ‘ $d$ ’ by:

$$d \cong \left(1 - \frac{3}{4N - 9}\right)g$$

Note: By convention the subtraction of the means (M) of the 2 groups (experimental and control), is done so that the difference is ‘positive’ if it is in the direction of improvement or in the predicted direction and ‘negative’ if in the direction of deterioration or opposite to the predicted direction.

**Step 4: Searching for Relevant Studies** – As the outcome of the MA is dependent and based on the quality and success of an assiduous search for potential studies, possible search directions are as follows: computer search engines (define relevant languages); Reference Lists from studies; Letters/ emails to journals and researchers in this field of study to include follow-up requests for missing data; Libraries – based on the electronic findings, physical visits to libraries for review and copying of full-text studies.

**Step 5: Study Database and Selection of Final Set of Relevant Studies** – all studies should be compiled into a ‘Master Data Base’ (MDB) within an electronic spreadsheet (after being assigned a unique ‘I.D. Number’), allowing for convenient repetitive sorting and extracting of data, and later on for transferring data to supporting statistical compatible software packages. The final set of studies, will be selected from those studies that meet all the inclusion criteria.

**Step 6: Data Extraction and Coding** - All studies should be reviewed for relevant information and note-worthy characteristics (that might be related to the effect size), pertaining to the study. This should be done by more than one researcher, and findings should be then compared between them and discrepancies cleared out.

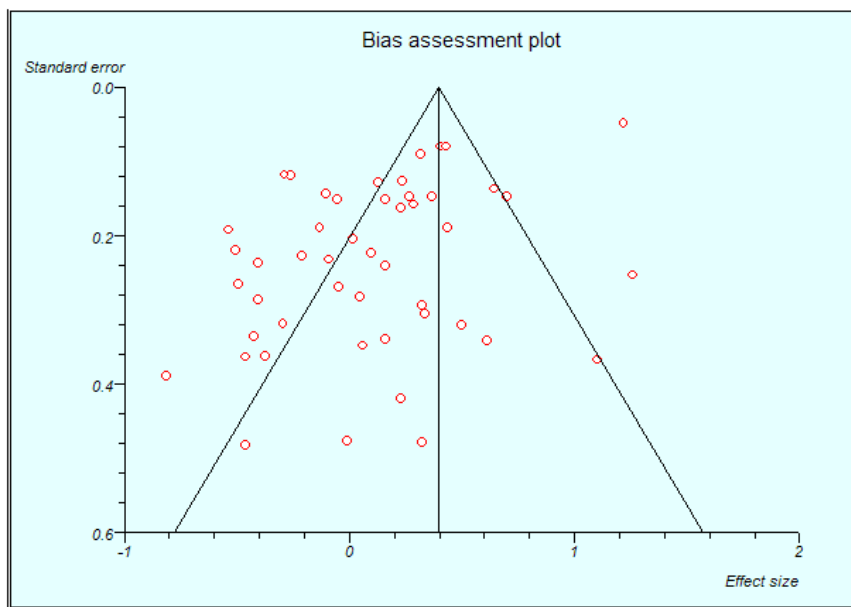
**Step 7: Determining the Individual and Overall Effect Sizes Across Studies** – (a) Individual effect sizes ‘ $d$ ’ or ‘ $g$ ’ need to be expressed in a standardized format to allow for comparison



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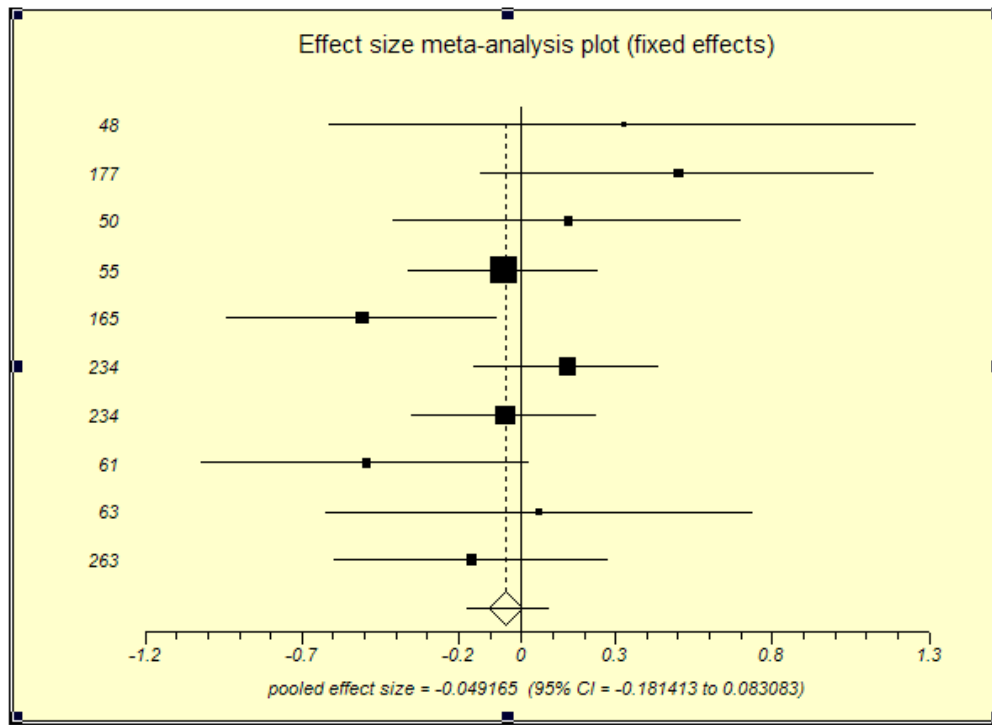
between studies, and (b) overall effect size ' $d+$ '. Once all effect sizes of the individual studies are acquired, the overall pooled mean effect size estimate ' $d+$ '<sup>3</sup> is calculated by utilizing a statistical computing software program (Shachar, 2002) – StatsDirect LTD (2002), using direct weights defined as the inverse of the variance of ' $d$ ' for each study/ stratum, and providing a confidence interval for ' $d+$ ' with a chi-square statistic and with the probability of this pooled effect size being equal to zero (Hedges & Olkin, 1985). Note: the researcher must decide on whether to use the 'fixed effects' model or the 'random effects' model, which differ in the way the variability of the results between the studies is treated.

**Step 8:** As a synthesis of a variety of studies and data is conducted, each with its own method of calculation, it is necessary to examine the robustness of the findings to different assumptions by conducting three Homogeneity and Bias analyses: (1) Homogeneity. The individual trials will show chance variation in their results, therefore, it is necessary to explore whether the differences were larger than those expected by chance alone. (2) Bias. One of the main concerns in conducting meta-analysis is that there would be a publication bias arising when trials with statistically significant results are more likely to be published and cited, and are preferentially published in English language journals (Jüni, Holenstein, Sterne, Bartlett, & Egger, 2001). The outcome of which would be that plots of trials' variability or sample size against effect size, and which would be usually skewed and asymmetrical in the presence of publication bias and other biases (Sterne & Egger, 2001), and are more likely to affect small trials. Detection of bias is done by the examination of the left-right symmetry of the plot (where asymmetrical plots denote small sample bias). For illustration purposes, see example in Figure 1. (3) Fail-Safe-N. Since only published studies are analyzed, there is the "file drawer problem," that is, how many studies that did not find significant effects have not been published? If those studies in the file drawer had been published, then the effect sizes for those treatments would be smaller. The researcher therefore needs to calculate the Fail-Safe-N based on Orwin's (1983) formula.

**Figure 1.** Bias Assessment Plot (Illustration)

**Step 9: Presenting the Results** – An overall effect size ( $d+$ ) calculated from a very large sample is likely to be more accurate than one calculated from a small sample. This margin for error can be quantified using the idea of a 95% confidence interval (CI) which is further explained in the end notes 4. As meta-analysis results are better understood when displayed graphically, the effect sizes with their 95% CI are presented using a Forest Plot (Egger et al. 1997), or by presenting the results in a histogram of the ‘ $g$ ’ effect size distribution. Figure 2 depicts a Forest Plot where: each horizontal line represents the confidence interval of an effect estimate ‘ $d$ ’; the effect estimate ‘ $d$ ’ is marked with a solid black square (the size of the square represents the Mantel-Haenzsel weight that the corresponding study exerts in the meta-analysis); and the pooled estimate ‘ $d+$ ’ is marked with an unfilled diamond that has an ascending dotted line from its upper point.

**Confidence Interval (CI)** – Whenever we estimate a parameter we need to know the distribution of said estimator, so, in addition to providing a point estimate of the parameter, we wish to obtain a confidence interval. The definition of a 95% Confidence Interval (95% CI) is: if the procedure for computing a 95% confidence interval is used over and over, 95% of the time the interval will contain the true parameter value, in our case the parameter of interest is the effect size. Hedges and Olkin (1985) provide several methods for computing the exact (when  $Ne+Nc < 20$ ) and approximate (when  $Ne+Nc$  is moderate to large) CI respectively. In a nutshell: (a) the large sample distribution of ‘ $d$ ’ tends to normality, and the asymptotic distribution of ‘ $d$ ’ is normal with a mean corresponding to the population ES. This allows us to use it to obtain an excellent large sample approximation to the distribution of ‘ $d$ ’. A 100(1- $\alpha$ ) – percent confidence interval for the ES is given by: ‘ $d$ ’ plus/ minus the two-tailed critical value of the standard normal distribution. (b) when we have small sample sizes, the calculation is based on the exact distribution of the effect size estimator ‘ $g$ ’, and utilizing the non-central  $t$ -distribution. It is recommended to review the statistical package used, for its choice of the CI calculating method.

**Figure 2.** Effect Size Meta-Analysis – Forest Plot (Illustration)

**Step 10: The Qualitative Interpretation of Effect Size ( $d+$ )** – Interpreting the results of a meta-analysis requires the understanding of the standards employed that allow for meaningful interpretation of effect sizes. The statistical community is not of one voice in regard to the interpretation of the effect sizes and although judgments about whether a specific effect size is large or small are ultimately arbitrary, some guidelines for standards do exist in the literature, to assess the meaningfulness of an effect size on one hand, and for conventional measures on the other. For example, Cohen (1977) suggested 0.2, 0.5, and 0.8 as minimal, moderate, and meaningful effect respectively; Lipsey (1990) categorized effect sizes into three groups: Small < 0.32; 0.33 < Medium < 0.55; and Large > 0.56.

### Meta-Analysis: Limitations

A meta-analysis is not a panacea and/ or a perfect solution to all research studies. There are many within the professional statistical community who question its suitability and validity by using buzz-words like “you are comparing apples to oranges,” and that the heterogeneity of studies does not allow for true comparisons.

The answer to this is two-fold. First, on the professional statistical side, there have been countless papers addressing these “flaws,” providing proof that if and when a meta-analysis is conducted correctly, and appropriate ‘corrections’ are implemented for various possible biases, the results are valid and reliable. Second - even if we do accept some scientific criticism, on the practical side, there is no other better method available to synthesize numerous studies.

## Discussion

### *Standardization in Research Reports*

Many of the researchers collecting, reviewing, and extracting data from previous research studies have regrettably noted that many of said studies suffer from flaws in their research design and/ or their representation (or lack of) of complete statistical findings. Furthermore, many meta-analyses overlap in the periods they cover and the studies they include/ exclude from their data bases (see Table 1). Should present researchers fully make available their databases and statistical findings to the scientific community, future researchers may and could be able to extract data for their respective meta-analyses analyzing every possible variable of interest.

As one sparrow, does not denote the coming of spring, so do the individual studies not suffice to form an answer regarding the effectiveness of DE. Thus, meta-analysis provides a comprehensive answer to the DE versus traditional education continuing conundrum, by analyzing and synthesizing a wide body of academic comparative studies.

The need is for research that guides practitioners in refining practice so the most effective methods are used. Given sufficient quantity and detail in the data, meta-analysis is capable of not only comparing the effectiveness of distance education programs to classroom-based programs, but it can compare features of various distance education programs to learn what works. For example: Various levels of education (i.e., high school, college, and university), so as to observe 'best fit'; the trend of DE versus F2F across time; various topics/ subjects of study, so as to observe differences between students enrolled in humanities, science or business courses; and other learning factors, such as satisfaction, evaluation of instruction and attitudes.

In the words of the "master" himself Glass (2000) on the 25th anniversary of the development of his meta-analysis method: "Meta-analysis was created out of the need to extract useful information from the cryptic records of inferential data analyses in the abbreviated reports of research in journals and other printed sources . . . Meta-analysis needs to be replaced by archives of raw data that permit the construction of complex data landscapes that depict the relationships among independent, dependent and mediating variables . . . We can move toward this vision of useful synthesized archives of research now if we simply re-orient our ideas about what we are doing when we do research. We are not testing grand theories . . . rather we are sharing data collected and reported according to some commonly accepted protocols. We aren't publishing 'studies,' rather we are contributing to data archives" (p. 17).

Who better than an Online Internet-based journal, such as IRRODL, should be the leading force to create and develop such a database and become the source of knowledge-sharing.

As meta-analysis is a unique and powerful tool that can provide for these educational contributions, it is therefore strongly implied, that the educational community, adopt meta-analysis, subject to strict adherence of its procedures, as a sound alternative approach to wide scope research, bearing in mind of course, Green and Hall's (1984) dictum: "Data analysis is an aid to thought, not a substitute."

## Conclusions

Meta-analysis, if and only if executed rigorously as detailed above, is a powerful concept and tool, carrying advantages and benefits to the individual researcher and the scientific community in addressing DE related research questions.

To name a few: (a) we transcend above and beyond the individual study by examining and synthesizing multiple comparison (experimental and control group) studies that, in turn, establish a sound base for generalizing findings; (b) we focus on effect sizes (not on  $p$  values), i.e., the magnitude of the treatment standardized across all studies; and (c) each study receives its fair weight within the overall ' $d+$ ' effect size.

By encouraging independent researchers to provide and publish their respective statistical data and findings, we can create a vast pool of common knowledge that will lay the foundation for researchers implementing meta-analytical methods, to see the *big distance education picture*.

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## Footnotes

<sup>1</sup>The formula for the pooled sample standard deviation is

$$s = \sqrt{\frac{(n^E - 1)(s^E)^2 + (n^C - 1)(s^C)^2}{n^E + n^C - 2}}$$

(Hedges & Olkin, 1985, p. 79).

<sup>2</sup>Unbiased Estimator – Because  $g$  is a *sample statistic*, it has a sampling distribution. The sampling distribution is closely related to the non-central t-distribution. Hedges and Olkin (1985) computed the correction factor  $J(m)$  as a constant tabulated for values of  $m$  from 2 to 50. The constant  $J(m)$  is less than unity and approaches unity when  $m$  is large, and is closely

approximated by  $J(m) = 1 - \frac{3}{4m - 1}$ . But for all working purposes, the formula

$d \cong \left(1 - \frac{3}{4N - 9}\right)g$  is most adequate.



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3' $d^+$ ': As the sample sizes of the independent studies we wish to combine differ, then the estimates from the larger studies will be more precise than the estimates of the smaller studies. Hence, it is reasonable to give more weight to the more precise estimates when pooling for ' $d^+$ '. There are many methods for assigning weights, e.g., StatsDirect, 2002 calculates ' $d^+$ ' by using direct weights defined as the inverse of the variance of ' $d$ ' for each study/ stratum.

4 Confidence Interval (CI) – Whenever we estimate a parameter we need to know the distribution of said estimator, in addition to providing a point estimate of the parameter, we must obtain a confidence interval. The definition of a 95% Confidence Interval (95% CI) is: If the procedure for computing a 95% confidence interval is used over and over, 95% of the time the interval will contain the true parameter value, in our case the parameter of interest is the effect size. Hedges and Olkin (1985 p . 85-91) provide several methods for computing the exact (when  $N_e+N_c<20$ ) and approximate (when  $N_e+N_c$  is moderate to large) CI respectively. In a nutshell: (a) the large sample distribution of ' $d$ ' tends to normality, and the asymptotic distribution of ' $d$ ' is normal with a mean corresponding to the population ES. This allows us to use it to obtain an excellent large sample approximation to the distribution of ' $d$ '. (a) The 100(1- $\alpha$ ) – percent confidence interval for the ES is given by: ' $d$ ' plus/ minus the two-tailed critical value of the standard normal distribution. And (b) when we have small sample sizes, the calculation is based on the exact distribution of the effect size estimator ' $g$ ', and utilizing the non-central  $t$ -distribution. It is recommended to review the statistical package used, for its choice of the CI calculating method.



October– 2008

## ***Book Review – Flexible Higher Education. Reflections from Expert Experience***

**Editor:** Elizabeth J. Burge (2007). *Flexible Higher Education. Reflections from Expert Experience*. London: The Society for Research into Higher Education & Open University Press (166 pages). ISBN – 13: 978-033521776-2.

**Reviewer:** Heather Kanuka, University of Alberta, Canada

‘Flexible Higher Education’ is an edited book with six of the chapters written by the book editor (Elizabeth Burge), followed by seven reflective chapters written by well-known distance educators and concludes with a final chapter, again written by the editor, Elizabeth Burge.

The contents of the book are based on the work of what the editor considers to be pioneers within the field of distance education, 44 in total. Funded by the Social Sciences and Humanities Research Committee, Burge interviewed each of these distance education pioneers. The composition of the pioneers selected is a good cross section of individuals from diverse geographies: Canada, Germany, Hong Kong, Oceania, United Kingdom, and United States. The kind of institutional experience of the participants selected by Burge is also varied: institutional leadership, institutional unit/ faculty/ departmental level administration, programme/ curricula development/ evaluation, teaching skill development, technology application, research/ documentation and development aid in various countries. The method used to collect the data was in the form of interviews, requesting the participants to reflect on their practice by exploring a range of topics: key challenges faced, guiding ideas, values, etc., for their practice; stressors experienced, lessons learned, technology managed; career highlights and lowlights; perceptions on any significant changes in distance education in their career; and factors that sustained their careers. The participants were also asked to offer advice to less experienced colleagues, as well as concerns for the future of distance education within higher education environments.

I personally found the first chapter by Burge to be difficult to read at times. Not because Burge’s writing is poor. Indeed, Burge’s writing is superb throughout the book. Rather, I found it was difficult in that I felt, as a reader, occasional statements were rather pejorative. For example, on page 7, Burge writes: “Postsecondary educators with shorter experiential views of distance and flexible learning may assume that lessons learned 25 years ago are not so relevant for today’s context.” While Burge may perceive this in her world, these kinds of statements in the first chapter are objectionable assumptions and generalizations to those individuals who are relatively new to distance education.

Once beyond the first chapter, the book becomes quite interesting. The following five chapters written by Burge are based on the analysis of the interviews. Nicely organized and based on an excellent analysis of the interviews, the reader is taken on a journey that moves from the challenges of inexperience, guiding practices, managing technology, learning from experience,

*Kanuka*

and looking forward. Each of these chapters are broken down into relevant themes on each of the chapter topics, with carefully selected quotes by the participants, weaved together in a manner that brings the abstract to the practical.

The following seven reflective chapters were also interesting reads. Perhaps the most interesting aspect to the commentators' meta-reflections was the way each overlaid their own world views on the data presented. Specifically, with the exception of Michael Moore's chapter, the reflections tended to be more about the chapter authors' personal views of distance education, than reflections on the prior chapters written by Burge.

In conclusion, the data analysis chapters written by Burge were a wonderful read; reminiscent of a walk down memory lane or a fireside chat with many colleagues I've never met. I've tried to give an accurate and honest description of this book and would like to close by saying that for distance education practitioners, new or experienced, I'd highly recommend purchasing this book.



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October– 2008

## ***Book Review – Making the Transition to E-Learning: Strategies and issues***

**Editors:** Mark Bullen & Diane P. Janes (2007). *Making the Transition to E-Learning: Strategies and issues*. Hershey, PA: Information Science Publishing, ISBN: 1-59140-950-0.

**Reviewer:** Sanjaya Mishra, Staff Training and Research Institute of Distance Education, Indira Gandhi National Open University, India.

While reading this interesting book, I had a big question lingering in the back of my mind. Should we be concerned at all about the “transition to e-learning”? Should we not make effective use of e-learning in both distance and non-distance education contexts? Having read the book, I can say emphatically that the editors – and most of the authors of the 20 chapters that constitute this book – believe in ‘effectiveness’ if not exactly the ‘transition’ to e-learning. After all, making a transition makes us move from one place to another; and in this case, we do not leave behind either the face-to-face teaching or traditional distance education. In the preface to the book, the editors make it clear that e-learning is being used “without a solid understanding of how to plan and develop instruction, of underlying teaching and learning theories, and of what makes the Internet a unique medium for teaching and learning” (p. viii). In order to address this gap, the editors successfully pulled together an experienced group of teachers and researchers from five different countries to contribute on pedagogical implications of new technology. Of the 20 contributions, however, only five come from outside of Canada; and thus the book is highly Canada-centric. In spite of this, there are enough good lessons to be learned for all of us in this book. Initially, the editors take on clarification of the meaning of e-learning, which fall under three major groups (Zemsky & Massy, 2004).

- E-learning as distance education;
- E-learning as electronically mediated learning; and
- E-learning as facilitated transaction software.

The book is organized into three sections: (1) institutional and conceptual issues; (2) learning and teaching issues, and (3) instructional design and technology issues. Section-I has six chapters. In Chapter 1, Marco Adria and Katy Campbell make a passionate case for ‘e-learning as nation building.’ Within the broad considerations of citizenship and nation building, the authors suggest that the metaphor of an ‘e-learning nation’ has the potential to be socially transformative, develop cultural identity and learning communities. Margaret Haughey, in Chapter 2, reports on the organizational models for faculty development in Canadian universities. In Chapter 3, New Zealand’s Oriell Kelly of the Manuka Institute of Technology presents an institutional case of adoption of e-learning as a strategic decision to shift the mindset of expert teachers. In the process, Kelly outlines the support provided to the faculty to maintain the quality of student learning experiences. Chapter 4, in my opinion, is probably the most significant contribution to this book. It comes from the experienced Tony Bates, who discusses the Southern Alberta

*Mishra*

Institute of Technology's strategic planning process of moving strongly into e-learning. In fact, every institution thinking of moving in the direction of use of e-learning (in whatever form), should consider the five-stage model proposed by Bates. In Chapter 5, Maggie Beers presents a case study of British Columbia Institute of Technology to show the strategies adopted in the five-year technology-enabled knowledge initiative. Beers rightly emphasizes that faculty engagement will ultimately determine the success of e-learning initiatives. The last chapter in this section, written by Ellen Vogel and Bill Muirhead, discusses the laptop nursing program at the University of Ontario Institute of Technology. They analyzed the data gathered over a two year period during the implementation of the laptop nursing program that aimed to understand the teacher competencies required to work in an ICT-enabled environment.

Section-II is comprised of nine chapters focusing on learning and teaching issues. Dirk Morrison of University of Saskatchewan discusses the imperative pre-requisite to the effective adoption of e-learning in higher education. Morrison argues for an e-learning environment that promotes holistic thinking skills and deep learning. In Chapter 8, Gail Wilson from University of Western Sydney returns our attention to the issue of faculty development. Cathy Gunn and Mandy Harper from University of Auckland describe a seven-year, incremental process of e-learning development in Chapter 9. Here again, the issue of faculty development as part of institutional change is shown to be of significant importance; this is an issue that policy-makers should look into. In Chapter 10, Richard Schwier and Mary Dykes analyze the online discussions of a graduate level course to discuss issues related to community building, social engagements, and content in online learning. In Chapter 11, Martha Gabriel explores the role of instructor's perspective of teaching and learning in the context of e-learning environment. Based on the five perspectives of Pratt and Associates (1998) – transmission, developmental, apprenticeship, nurturing and social reform – Gabriel proposes guidelines for effective teaching. Dianne Conrad in Chapter 12 discusses the challenges faced by online teachers and offers suggestions to build collaborative communities. In Chapter 13, the focus shifts to learners, and Helen Wozniak from Australia emphasizes the importance of learner engagement and, therefore, the need to empower the learners on the processes and steps needed to learn online. Wozniak presents six different online activities to help the learners. Using Moore's dialogue and structure in Chapter 14, Tannis Morgan and Karen Belfer present a framework for planning communication activities in e-learning. In Chapter 15, Richard Kenny argues for use of problem-based learning designs in online courses.

Section-III is comprised of five chapters. In Chapter 16, Lucia Botturi and colleagues from University of Lugano in Switzerland recommend the use of fast prototyping in e-learning design projects. The next chapter comes from Spain by Albert Sangrá and colleagues, and places emphasis on educational design, and debate on the issue of technology-content-faculty, specifically: Which one should come first? In Chapter 18, Tracey Leacock and John Nesbit present a software tool for self-regulated learning called 'gStudy.' Though some of the facilities are already available in today's operating systems, the 'gStudy' should be useful for students learning in the digital world. Elizabeth Murphy and Thérèse Laferrière discuss the use of online synchronous tools in Chapter 19. The final chapter, by Adnan Qayyam and Brian Eastman, focuses on PowerPoint and its use in e-learning; sadly, the statistics on use of PowerPoint for e-learning is alarming, as the tool is not really meant for teaching. While Qayyam and Eastman discuss the problems of PowerPoint as a pedagogic tool, they also emphasize that it could be used in a better way. To emphasize their point, they bring in the debate related to 'do media influence learning?' They show us that there is a need to rethink the organization and design of PowerPoint presentations, because while teachers may find it easy to use and useful, it is certainly not a tool designed for e-learning.

*Mishra*

As I mentioned in the introduction to this review, the book presents tremendous food for thought – though faculty development issues remain predominant in many chapters. The book should be of interest to all of us engaged in designing effective e-learning environments.

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## ***Book Review – Expectations and Demands in Online Teaching: Practical experiences***

**Author:** Sorin Walker Gudea & Terry Ryan (2008). *Expectations and Demands in Online Teaching: Practical experiences*. Idea Group Inc., Hershey PA. ISBN: 1599047470.

**Reviewer:** Caryl Lynn Segal, University of Texas at Arlington (retired)  
University of Texas at Brownsville, online adjunct

Since I have taught online exclusively for the past eight years and have taught at the post secondary level for more than a quarter century, I must confess, I approached the book with a built-in bias towards online instruction.

I love teaching online and found many of the comments in the book to be evidence of lack of knowledge of online teaching pedagogy and available technological resources. The authors have only had experience teaching online for the University of Phoenix, according to the biographies listed by the publisher, which may explain some of the book's weaknesses.

The book is marred by the pool used for the in-depth interviews. If Gudea and Walker wanted to explore the world of online instruction, the pool should have been limited to those who teach online. The reasons given for why someone did not want to teach online (who had never done so) fail to provide insight into what online teaching is all about.

Another weakness was redundancy in the explanation of the methodology since it was adequately covered in the appendix and did not need to be discussed in multiple chapters. For instance, the same quotes are used more than once: "I can't see the light bulbs pop up." "Online is a female-friendly environment" was jarring not only because of its sexist nature, but because males can be equally shy and uncomfortable speaking out in a lecture hall.

It also appeared as if a large number of those interviewed were adjunct faculty. Adjunct faculty will have a different perspective from those who have been teaching for a number of years in the same college/ university both face-to-face and online. Looking at the age-range of those interviewed indicated that few would have been trained in their fields using computer technology.

No information is provided to indicate the breakdown of those interviewed who work in public colleges and universities, and those who worked for private colleges and universities, and those who worked for for-profit organizations such as the University of Phoenix. The author uses a number after the quote for the sake of anonymity, but using a number followed by some key to the educational institution might have proved illuminating and also helpful to administrators and Web designers.

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The authors' state that all those interviewed had Masters degrees, but no breakdown is given for how many have terminal degrees. Also missing is demographic information to indicate the percentage of tenure and tenure-track faculty.

It would also have been helpful to know how many respondents created their own online courses and how many taught courses written by others as well as how many were dealing with administrative written pre-determined templates.

Adjuncts are certainly a large component of today's online teaching faculty, and in many cases are called upon to teach material developed by someone else. Some of those interviewed appeared to be given little support from their institution's information technology (IT) departments and given little training on how to adjust an online course during the semester.

No mention was made of the many distance education programs offered by various professional associations either. Spending a few days at a conference provides an opportunity to speak to others who face the same challenges and learn new ways of making your own teaching more effective. Providing access to these conferences or subscriptions to distance learning publications should have been a suggestion for administration.

The book according to the publisher's description was written for administrators and course designers as the primary audience. It offers some valuable insights into the problems faced by some online instructors. Course designers should gain a great deal by reading the interviewees comments and mentally thinking of ways in which the perceived problem might be rectified. I even found myself thinking, "Have you thought about 'xyz' as a solution?"

There was no discussion of the way in which Web 2.0 could be – or was – incorporated into online courses. It is quite possible that when the interview questions were written, this area was overlooked. Gudea and Walker discuss the methodology used, but omit the questions that were posed. Knowing the questions might have made the book more meaningful.

The authors stressed multiple times that online teaching was more time demanding because of the student-teacher interaction and a sense of a course being held 24/7. In my experience, if you factor in the time one spends with office hours, commuting, student telephone calls, class preps, and grading, the time demands are greater but not unreasonably so. The time demand is greatest during the content input/course design period. If a course is well developed and students are provided with a detailed syllabus, email is limited to one or two a week originating with the student and more in response to private notes from the professor. Reference is also made to online having a high drop-out rate. This is definitely not the experience that neither I, nor my peers, have encountered.

Time and again those interviewed mentioned not knowing how much students are learning. A well designed course provides a great deal of information and feedback for the professor. Since exams do not take so much of the lecture time, much more time can be given online to check on comprehension and understanding. Another plus is that students get instant feedback results for those exams that are not discussion based.

Multiple comments were made about the need for good communication skills, especially written communication. But overlooked was the fact that all teaching requires good communication skills, more verbal in the classroom and more written online. Unfortunately, there was no mention made of critical thinking and critical analysis as skills that should be goals of a course.



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I found it offensive that the author concluded on page 188 that “there is more learning on-ground than online.” The author then added, in my opinion, insult to injury by stating “there is not much deep learning online.” In a well designed course the degree of critical thinking and critical analysis by students is, at a minimum, equal to – and normally far exceeds – the student in the classroom on campus.

A few of those interviewed commented on having to “entertain” students, while no one mentioned making the material more relevant to the student, thus encouraging them to explore and learn more. The Internet is rich with both audio and video, and links in the course material can more than satisfy any perceived entertainment need. There is a wide chasm between an entertainer and a teacher.

Some of the comments were hard to fathom when talk was about the quality of the students. With the exception of senior level courses in a major field, the average lecture hall is made up of students at all levels of intellectual and academic development. The idea of teaching to the lowest common denominator was distasteful. When standards and expectations are high, students rise to the challenge or drop the course.

On page 193, Gudea states: “. . . anything that requires drawing on a board or working a problem on the board is difficult to accomplish online.” This is simply not true. The technology exists to even hyperlink from a problem to the answer that emulates what would have been written on the chalkboard. This can even be done when the wrong answer is given on computer generated exams. Blackboard, WebCT, and other popular programs have this capability and it exists using Moodle or other open source, copyright free programs.

Another perceived weakness was that none of those interviewed mentioned professionalism and academic standards. I think a pool taken exclusively from college and university faculty, both full-time and adjunct, would have made the material more valuable, especially to course designers and administrators.

Overall, I conclude that the weaknesses of this book exceed the strengths. The content did not live up to the expectations generated by the title.



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## ***Book Review – Video in Research in the Learning Sciences***

**Editors:** Ricki Goldman, Roy Pea, Brigid Barron and Sharon J. Derry (2007). *Video in Research in the Learning Sciences*. Mahwah, NJ: Erlbaum. ISBN 0-8058-5360-X.

**Reviewer:** Madhumita Bhattacharya, Centre for Distance Education, Athabasca University – Canada's Open University

Video Research in Learning Sciences gives a new insight to research methodologies in learning sciences. This book is an important source of collection of chapters covering the art, science, and practices of video for in-depth research of human interaction in learning environments. Videos are used for collection of research data in all fields of research. This is the first book of its kind that has dealt with the topic of video research in such a great depth and versatility. Video Research in Learning Sciences - not only is it an accessible and out of the ordinary textbook for researchers, but it is also an excellent reference resource for people who want to use videos for a specific purpose in a teaching and learning context.

This book is divided into four sections and 35 chapters. Each part has a cornerstone chapter, which sets the scene for the reader by giving an overview of the chapters included in that section. The cornerstone chapters also introduces to the relevant issues and concerns in particular area of video research which gives triggers to the readers to be critical about the author's point of view in the chapters.

The first part on theoretical frameworks discusses a range of theoretical and methodological approaches to conduct and present research in learning sciences using video as a research tool, and in particular how video affects the nature of conducting research when it is used to build learning communities and cultures. This section provides the philosophical basis for the book. This section contains ten chapters including diverse perspectives to video research from ethnography, semiotics, conversational analysis, aesthetics, pleasure, and phenomenology. Each chapter author(s) describes in a meticulous way how video complements and enriches their process of making meaning in and of educational environments, and what particular challenges they have faced in conducting video research. The final chapter in this section introduces to the concept of ways of seeing video. This explanation opens up a wider perspective of purpose of viewing video.

Part 2 commences with a chapter which give details about video as a tool to advance understanding of learning and development in peer, family, and other informal learning contexts. This section presents a new insight into the use of videos for researching informal learning and

discusses the challenges of doing so. The chapters in this section provide directions for selecting and coding videos purposefully.

The third part of the book covers video research in formal educational settings. The cornerstone chapter in this section discusses the issue of standards for videography and raises a number of thoughtful questions and gives suggestive ideas for the researchers. Chapter authors discuss usefulness and difficulties of using video research in formal settings for learning, assessment, training, and professional development.

The final part of the book on “video collaboratories and technological futures” encompasses cutting-edge uses of video technologies for researchers of 21st Century. Authors engaged in advanced theoretical and methodological video researches envisage the future developments of video technology. This section introduces emerging tools and technologies for video data collection, analysis and interpretation. The chapters under this section give a panoramic view of the potential of video technologies for researches in learning sciences.

There are substantial references at the end of each chapter. It would have been a good idea to provide the list of references of each chapter in the electronic form at the publisher’s website or book website, for the readers to be able to search the references through electronic library databases. I visited the online site mentioned in the book. I felt that the potential of online presence have not been utilized well for this book. It could be possible to make it an interactive website where views from readers could be collected for future improvements.

In social and behavioral science research humans form the focus, and there is therefore an ethical dimension to most research activities in the field. Different chapters in this book explain why it is important for us to be conscious of the ethical dimensions of using video studies in any research in this field. It would have been a better idea to provide a chapter under each section discussing the ethical issues concerning the use of digital videos for research especially for part 2, 3 and 4.

If you plan to carry out learning sciences research in your discipline using videos then Video in Research in the Learning Science is an invaluable resource to help you through.



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## Technical Evaluation Report

# 64. Traditional to Online Media in China and Korea: unfulfilled promise

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### Abstract

The governments of China and South Korea have supported the development of distance education both legislatively and financially. The use of traditional media for this purpose has been successful in both countries, though the evolution to Internet-based education has been only partially successful. This report describes this process in terms of uncritical application of western distance education technology and methodology in environments that are unsuitable for them. Until these issues are addressed, it is suggested Web-based educational approaches in South Korea and China will remain unreliable, and will fail to provide a complete service to students.

**Keywords:** Internet; TV; radio; online learning; accessibility; open and distance learning; China; South Korea

### Introduction

South Korea and China are two of Asia's most developed nations. In both nations the use of open and distance learning (ODL) methods has grown substantially in recent years. Toshiyuki, Kim and Lee (2000) found that despite a “history of cyber education in Korea [that] is relatively short, the country's commitment to it is strong” (p. 107). In Korea, ODL is marked by thriving Internet-based courses and a discernible movement away from print-based correspondence and TV-based courses. While this shift has been generally welcomed by ODL specialists, the unquestioning acceptance and misapplication of western distance education (DE) methods in both countries has resulted in problems for both learners and teachers.

The major user of DE methods in South Korea is the Korea National Open University (KNOU). From its inception (Kim, 1999), KNOU's primary mode of delivery has combined the printed textbook and other media including TV, radio, audio-cassettes, and video-conferencing. In 1996, a cable TV channel was added to KNOU's infrastructure; and the Open University Network (OUN) “has been providing programs of regular degree courses to KNOU students and non-degree lifelong education courses to the general public to meet the needs for higher education and retraining” (Kim, 1999, p. 14). The TV channel switched from cable to satellite in 1999 “in order to expand distance education services to those who live in remote areas where cables have not

been installed” (p. 14). These delivery methods require students to be available for face-to-face classes.

Such opportunities for teacher-student interaction suit Korean students, suggest Lee, Chun, Im and Heo (2003), whereas a major problem encountered in online education in Korea is the “lack of a support system to help students manage the learning process” (p. 6). Lee and colleagues stress the need for greater use and availability of support facilities for online DE in Korea, in order “to help students who are on their own in the distance education environment and suffer from difficulties managing the learning process” (p. 6).

In China, DE delivery has been based on uses of the broadcast media, primarily by the China Central Radio and TV University (CCRTVU). In the last decade, these traditional media have been challenged in China by the rise of Web-based course offerings. Chinese DE, as indicated by Zhang, Niu and Jiang (2002) “has evolved through three stages: correspondence-based education; broadcasting/ television-based education since the 1980s; and advanced distance learning based on information and Internet technologies since the 1990s” (p. 5). While the first two stages are well-established in China, Zhang and colleagues argue that “the third stage is still in the embryonic phase, but is experiencing rapid growth and development” (p. 5). As the current report indicates, this growth has not been without problems. Chinese experience with Web-based learning in particular indicates that, while the technology may work well in western ODL environments, many Chinese learners are ill-equipped for online study and instructors have been poorly trained in the technology's use.

The report examines the adoption of Internet-based DE methods in these two nations, and the problems that have accompanied it.

## **Evolution of Online Education in China**

Modern DE in China dates back to the end of the Cultural Revolution, and the formation of the CCRTVU, the largest open learning system in the world. The CCRTVU was established in 1979 to build “on earlier work of correspondence colleges and autonomous radio and television institutes in large cities” (Murphy & Yuen, 1998, p. 5). In the early 1980s, many CCRTVU students were either full-time or part-time employees released from their places of work with basic pay to study either at work or at designated study centres (Ma & Hawkrigde, 1995, p. 28). The University was under the auspices of the State Education Commission and the Ministry of Radio and Television, and its regional branches were under local government leadership. A US \$65 million loan to the CCRTVU by the World Bank allowed the University to equip TV stations and to train staff; and the installation of satellite facilities and ultra-high frequency transmitters allowed the University to expand its coverage in urban and rural areas.

In 1987, the CCRTVU curriculum had evolved to meet the “immediate national needs for middle-level expertise” by providing professional continuing education (Ma & Hawkrigde, 1995, p. 31). By 1991, about 5,000 hours of educational programming were being broadcast. Closely monitored by the State Education Commission and its provincial counterparts, the University's approach to DE was lauded as the education of large numbers of students at low cost. Chen, Wang and Chen (2007) found that improvements in TV technology have since lead to major developments in educational video broadcasting and video-conferencing, and that satellite broadcasting in China is a vital DE delivery method as well as “the largest information

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transmission medium” in the country (p. 42). Radio and TV at CCRTVU continues to play an important role in helping China achieve its long-term goals of education for the masses.

During the last decade, however, the use of the traditional media at CCRTVU has been challenged by the promise of Internet-based technologies emerging in other parts of the world. Carr-Chellmann and Zhang (2000) described government statements as indicating that China “is prepared to leverage this history of distance education to reach a broader audience through the internet” (p. 304). They cited a speech by Wei Yu, Vice Minister of China's Ministry of Education, stating that “the prevailing fashion across the world is to apply multimedia technology and computer networking system in distance education and to implement individualized self-learning associated with interactive group discussion” (p. 305). The vice minister recommended a three-stage approach for the uptake of Internet-based learning. The first was to develop educational technologies emphasising multimedia and promoting its use in schools; the next was to broaden the public’s knowledge about networking systems; and the third was to develop modern DE approaches “to build and provide tremendous online resources, so as to satisfy the ever-growing needs for lifetime learning in the society” (p. 305).

Wang (2005) states that since 1998, “the Chinese Ministry of Education has approved of 68 institutions of higher learning experimenting with Web-based education in China” (p. 1), and that 1.373 million students were registered in Web-based institutions by the end of 2002. Wang adds that “[t]he Chinese Ministry of Education attaches great importance to the development of online education, which is deemed important for achieving the lifelong educational mission of the country” (p. 2). While Chinese policy-makers have commonly extolled the advantages of advanced, western technologies, however, their sentiments seem starkly disconnected from the country's economic realities. In China, many students live in poor and isolated rural areas where Internet-based learning is unavailable to them. Yet the use of Internet and Web-based methods in China is increasing nonetheless.

There are positive aspects to China's move towards expanded online learning opportunities. Zhang, Niu and Jiang (2002) have argued that Web-based education “has provided a new path to people desiring access to higher education, and is thereby seen as contributing to the government's goal of popularizing higher education among its vast population,” and that online learning “has increased and extended the use of the educational resources developed by conventional universities” (p. 11). The move to online instruction has resulted in quality educational resources being shared by staff and students, and in increased educational services for campus-based learners. Web-based education “has provided new ways of thinking and new methods of teaching and learning,” (p. 11) and has led to a concerted move away from teacher-centred instruction to a more learner-centred style. In this environment, “students have more autonomy in their own learning, and teachers play a more significant role as facilitators” (Zhang et al., 2002, p. 11). Wang (2005), however, finds that many students lack the “autonomous learning qualities needed for self-directed learning [which has] resulted in their ineffective use of learner support services available to them” (p. 6).

Zhang and colleagues (2002) have reported other problems in China’s move to Internet-based education. They note a “shortage of online instructional resources and duplication of online programs” (p. 13), and state that many of the “44 conventional universities offer similar specialties and course offerings, each requiring substantial investments in course research and development” (p. 13). The result, they suggest, is a “duplication of resource materials produced by these universities, thereby creating unnecessary waste in terms of human and financial resources” (p. 13). They also note problems in the management of online learning support centres

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across China, and the need “to establish and maintain constructive and mutually beneficial relationships between partner institutions to ensure effective learning and student support” (p. 13). Lack of teacher training is another major impediment to online learning. Without proper training, “it is hard to expect teachers to produce top quality online learning materials and provide top quality learning support to students” (p. 13). Zhang and colleagues conclude that the lack of graduates from online institutes raises credibility and quality concerns about Chinese online education generally.

In order to overcome such problems, Reiser and Gagne (1983), as cited by Zhang and Hung (2007), indicated that “the selection of the teaching and learning media should be executed in line with the learning context” (p. 4). Wichit (1997), cited in the same source, wrote that the major factors to be taken into account in the design of course delivery methods include the availability of adequately developed technology, and their suitability for both teachers and learners. The selection of the Internet and Web-based media in China has not conspicuously fulfilled these criteria. Zheng, Ouyang and Rui (2002) described lack of Internet access as one of the major hurdles to online learning in China, and that “people in the inner lands have fewer chances to access the latest technology than do people from coastal cities and provinces” (p. 91). These writers mention that the cost of equipping learning centres with computers in order to accommodate learners in China is prohibitive. Chen, Wang and Chen (2007) argue that these problems have continued to the present day, and that Internet-based schools in China lack sufficient knowledge of DE standards and procedures, enroll students who lack DE learning skills, and suffer from a lack of experience in e-learning methodology.

## **Evolution of Online Education in Korea**

The evolution from TV to online DE methods in South Korea has followed a similar path to that of China. As Korea’s ICT infrastructure has developed and the Internet has become more widespread, Internet-based teaching and learning has moved into mainstream education. Toshiyuki, Kim and Lee (2000) recalled that “the Korea Educational Reform Committee proposed the implementation and operation of cyber universities as a new higher education model in August 1996 [and since then] most universities in Korea have begun to run cyber classes in various ways” (p. 107). By 1999, “700 courses were offered by pilot cyber universities [with] 50,000 registered students” (p. 108). Cost-effectiveness has been a constant issue, however. Jung (2000) noted that at KNOU “the average cost per student in a 16-week Web-based course for 30 students is US \$434, whereas a typical 16-week distance education TV course for 1,000 students costs US \$80 per student” (p. 9).

In 2001, Lee indicated that quality of Web-based instruction in Korea was hindered by failure to account for learning style, and that to improve, its educators and administrators must stop “treating all learners uniformly” (p. 131) and start “taking dissimilar adaptation styles of learners into account” (p. 131). Lassche (2000) criticised Korea’s move to Web-based learning as a “leap before you look” decision. He suggested that government initiatives such as the *Brain Korea 21* project and the *Virtual Education Trial Project* have led to universities “competing with each other to implement information technologies (IT) in order to qualify for much-needed funding,” and that Korea has “introduced network technologies without much support from empirical findings” (p. 57). Because adequate funding is not forthcoming prior to IT implementation, there has been little chance “that *a priori* research, being self-funded, would be conducted” (p. 57). Misko, Choi, Hong and Lee (2004) have predicted that the scarcity of operational regulations for Korean cyber-universities will result in ongoing difficulties. They state that “the criteria for establishing an online university [and] arrangements for managing academic affairs . . . continue

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to be based on factors inherited from the regulatory policy of the traditional offline classroom educational institutes” (p. 56). The design of buildings and credit hours, the selection of teachers, and the structure of the academic year for cyber-universities are all based on conventional educational models. As early as 1996, Cuban, cited by Lassche (2000), suggested that a fundamental problem with Internet-based learning lies in the misleading way that “techno-reformers” argue the reasons for its failure.

“To techno-reformers the answer is simple: Teachers lack the access, knowledge, and skills to use these machines properly. When teachers are thus blamed, solutions also become obvious: Provide teachers with sufficient computer hardware and software, technical assistance in using the machines, and better preparation programs. Technology-leaning policymakers, corporate leaders, and other influential non-educators, with their access to media, have framed both the problem and the solution. Teachers...remain voiceless in setting the reform agenda.” (p. 60)

Criticising the “top-down administration of the procedure,” Lassche (2000) also indicated that “teachers and students alike need to share in developing and maintaining a vision for any proposed changes in education, such as the use of network technology” (p. 67). Simultaneously, Kim (1999) argued that excessively rigid curricular design, with “no formal mechanism to identify specific learner needs of adult students” (p. 12), has hampered Web-based teaching and learning in Korea. He also indicated the need for improvements in the assessment of online learning so that it would “reflect the relevance of education” (p. 15), and that the existing system of feedback to students was too slow, with students insufficiently involved in the educational process: “students’ culture of passive involvement in discussion is . . . an important reason for the inactivity in the online group discussions” (p. 15).

For Web-based learning to be effective in Korea, a number of developments are needed according to Jung (2002), including:

- A “regular system to monitor and evaluate the development and implementation of online education”
- More feedback opportunities, especially for adult learners in just-in-time training courses
- Organised sessions to facilitate self-directed learning are necessary to help learners develop and strengthen competencies in managing the independent learning process
- Continuous development programmes for online staff which focus on educational effectiveness
- More attention to instructional design factors such as flexible course structure, quick and frequent feedback, visual layouts, and multiple zones of content knowledge. (Jung, 2002, pp. 28-29)

Leem and Lim (2007) have concluded that the state of online learning in Korea has not changed appreciably to this day. Reporting a study of 201 Korean Universities, they find that 85 per cent have investigated implementing e-learning possibilities, but that teachers and students alike lack adequate support systems and opportunities for active participation in e-learning programmes. Today, most large Korean universities and colleges remain technically ill-equipped for online learning, and lack the funding and policies needed for its development. This study also reveals a general lack of much-needed contact between schools and industry.

In view of the disappointing history of online learning in Korea, it is timely to recall Lee's warning (2001) against adopting an overly optimistic attitude towards Internet-based learning,



and remember that “innovations throughout the educational history did not last very long and resulted in mere bandwagons” (p. 122).

## Conclusions

The DE experiences of South Korea and China share many similarities. Both countries have seen their distance education initiatives grow from correspondence-based education to teaching and learning through uses of radio and television, and to current investment in Internet-based education. Cyber-universities have expanded rapidly in Korea, and conventional universities have also begun to offer online instruction. By 2005, more than three million students in China were registered in online courses (Wang, 2005).

In both countries, however, the move to Web-based education has been characterised by problems readily identified with an unthinking application of inappropriate western models in the Asian environment. Korean educational institutions have rushed to implement online learning in order to qualify for government funding, with an attitude which appears to disregard the students, the teachers, and the need for both to be equipped with skills to handle online learning and interaction processes. Teachers and students have also been left out of the decision-making process - two of the main stakeholders in the educational setting ignored – and top-down administrative decisions regarding Web-based instruction have resulted in flawed applications.

In China, the switch to Internet-based learning has contradicted the CCRTVU's evident, long-standing success with the traditional media of radio and television. The CCRTVU model has been shown to be cost-effective with an expanded reach throughout the nation. The Chinese government, however, in its pursuit of education opportunities for all its citizens, has decided that the “prevailing fashion across the world is to apply multimedia technology and computer networking system in distance education” (Carr-Chellmann & Zhang, 2000, p. 305), and that this must also be the right path for China. As in South Korea, this decision has failed to yield reliable educational services. Students lack the learning skills for participation in online courses; teacher training and online resources are lacking; Internet facilities are unevenly distributed the country, and are especially lacking in rural areas; and the general result is a lack of credibility for Web-based education across the nation.

If two of the most developed nations in Asia cannot efficiently implement online learning in more than a decade, what hope do less developed nations have of doing so? Until the problems impeding Web-based education in China and South Korea are appropriately addressed, it will continue to produce uneven results.

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## Technical Evaluation Report

# 65. ICT-based Distance Education in South Asia

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Rome

### Abstract

This report provides an update about innovative uses of information and communication technology (ICT) for distance education and training in South Asia. Particular focus is given to ICT initiatives in India, Sri Lanka, and Bhutan, at university level, and in non-formal interventions. Lessons learned from these countries are of value to any developing nation that wishes to address the improvement of educational and living standards of its people. The report stresses current uses of ICT serving the distance education needs of rural populations, and concludes that in all three countries the traditional media, including radio and TV, must play an important continuing role to ensure that education is accessible to the widest possible range of students.

**Keywords:** Appropriate technology; traditional media; e-learning; community development

### Enabling Hardware

Distance education (DE) can be an important building block in the improvement of social and economical conditions of poor people, particularly in developing countries, given their large rural populations. A review of distance education (DE) approaches in South Asia indicates a wide range of innovative technologies under development for DE purposes in major universities and non-formal rural programmes. The current section stresses educational uses of ICT in India and Sri Lanka. The innovative spirit and importance of these initiatives may be viewed in the light of the basic development indicators of these countries: e.g., urban/ rural population, Internet and cell phone penetration, and gross domestic product (see Table 1).

**Table 1:** Key indicators for Bhutan, India and Sri Lanka (UNDP, 2005)

	GDP	Urban	Population	Internet (per 1000)	Cell-phone (per 1000)	Literacy
Bhutan	\$1,325	11.1%	600,000	39	59	47%
India	\$3,452	28.7%	1.1 billion	55	82	61%
Sri Lanka	\$4,595	15.1%	19.1 million	14	171	91%

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An interesting hardware development in India is the *Simputer*, a simple, inexpensive multilingual computer originally designed in 1998. It was conceived to allow illiterate people to use computer facilities such as the Internet and email, via facilities such as handwritten text comprehension and audio. Factors limiting its potential are the *Simputer's* dependence on batteries, and its cost which, at between US \$240 and \$480, is contained but still excessive for poor people (Purbo, Chin, Hague, Kaminura, Koanantakool & Pandey, 2005, p. 53).

Several versions of the *Simputer* were produced. The shared version is intended for village chiefs and for use in central points where members of the community can employ their own smartcards. Fonseca and Pal (2003) indicated that the *Simputer's* design needs to be improved if it is to overcome the substantial training required by new computer users, and that the device is rapidly losing competitive advantage over commercial mobile devices. The Indian government has invested in *Simputer* development, though has not been able to provide sufficient investment for research and design functions. Despite its drawbacks and the likelihood that it will never become a popular device, the *Simputer* is a prime example of the technical sophistication of India's efforts aimed at benefitting unprivileged people, and of the inadequate contribution of the private sector in such initiatives (Fonseca & Pal, 2003, p. 17).

The *corDECT* wireless local loop standard is another technological innovation from India. Unlike the *Simputer*, however, it has been utilised extensively in India and other developing countries including Argentina, Kenya, and Iran (Purbo et al., 2005, p. 51). Sponsored by the Indian Institute of Technology in Madras, *corDECT* is best implemented within an advanced phone-line infrastructure, with the addition of radio-signal features for Internet connectivity. The system is particularly useful in rural settings, where it can cover approximately 10 km, easily extendable to 25 km, and is considered one of the best connectivity solutions available in this situation (Rahman & Pipattanasomporn, 2002).

## **Educational Programmes**

Based on innovative technologies such as the above, India and Sri Lanka have developed sophisticated educational systems using extensive DE approaches. Sri Lanka has given education a high priority ever since gaining its independence in 1948, and has achieved literacy for over 90 per cent of its people, the highest level in South Asia (Country Studies, 2007). Its government has enforced rigorous policies at all levels of education, has strengthened the public school system, and has set a high priority on providing adequate educational funding. Thanks to external donors and strong government policy, Sri Lanka has initiated several e-learning projects at university level – for example, in the Bachelor of Information Technology programme at the University of Colombo; and the Open University of Sri Lanka uses a broad range of DE approaches and local study centres (Jamtsho, Rinchen, Khan, Sangi, Ahmed, & Samaranayake 2007, p.23). In addition, a major ten-year project devoted to Distance Education Modernization was launched in 1999 with multi-million dollar grants from external donors, though its outcome has not yet been clearly evaluated and documented. In Sri Lanka generally, research on the precise effects of educational technology has so far been scarce (Karunanayaka & Wijeratne, 2005).

India has not given basic education as high a national priority as Sri Lanka, although its open university network, led by Indira Gandhi National Open University (IGNOU) since its inauguration in 1985, is an ambitious attempt to provide “education for all” (Sharma, 2001). IGNOU (well covered over the years in this Journal) usually imposes no entrance requirements, so students from all backgrounds and social groups can study at a low cost subsidised by the government. Most courses use printed text, accompanied by audiotapes, videotapes and other

technology. Some courses use teleconferencing, lessons on TV/ radio, CDs, Web-based content, and interactive radio counselling, and learning centres located throughout India to provide supplementary learning aids and support services. IGNOU has grown substantially since its establishment in 1985, and in 2006 had 1.4 million students and over 1,500 study centres.

An educational radio station in India, *Gyan Vani* (Voice of Knowledge), opened in 2002 using the infrastructure of the centrally controlled Air India Radio (AIR). *Gyan Vani* broadcasts to learners of all ages from primary school to university level. It serves a wide range of community needs, using innovative radio formats involving two-way communication (Chandar & Sharma, 2003). Agrawal (2005), however, claims that Indian learners generally prefer TV technology and that several educational projects which have used broadcast radio have not been pursued to completion. India has over 40 years of experience using broadcast TV at primary to university levels, including interactive TV programmes using teleconferencing via dedicated educational channels. Stations such as the public *Gyan Darshan* and the private *Zee TV* provide round-the-clock educational broadcasting. Evaluations have indicated a generally positive audience response (Agrawal, 2005).

To promote the use of e-learning at IGNOU, telecentres have been created throughout India, equipped with computers and Internet connections. Despite the rapid growth of these programmes, Sharma (2001) points out a number of teething problems: the absence of teacher interaction, the unavailability of the programmes outside the major cities, and a “polemical privatization” of some of the telecentres. Agrawal indicates that, in general, e-learning initiatives in India have benefited privileged and urban students.

In general, India has been innovative in its uses of diversified DE technology to provide university- level education. Agrawal (2005, p. 20) has indicated however, that “[d]espite 40 years of educational broadcasting, it is difficult to determine its role and scope in the context of Indian education,” and that educational technology in India has widened the gap between those who have educational access and those who do not. Despite its attempts to explore diverse DE approaches in university level education, India has not adequately addressed the issues of primary and secondary education. Fozdar, Kumar and Kannan (2006), in a study of student dropout from IGNOU's Bachelor of Science programme, have indicated that DE institutions, such as IGNOU, should also seek to improve their low rates of student retention. The most common reasons for dropout involve the unmanageable distance from students' residence to the nearest study centre, and hence a lack of academic support and interaction with fellow students. Suggestions for improving student retention include increasing the number of study centres nationally, and providing additional student support.

Neighbouring Bhutan is in a good position to learn from its two southern neighbours – from their failures to provide basic education and to reach out effectively to rural areas, and from their successes in establishing study centres to democratise education and to widen its accessibility, and in applying diversified educational delivery methods (i.e., interactive audio, video, radio and TV, etc.). The Royal University of Bhutan (RUB) is made up of ten colleges and institutes and currently has a relatively small student body of 4,000 students (Royal University of Bhutan, 2007). Its use of distance learning is so far limited, and its exemplary case is the Distance Teacher Education Program (DTEP), a five year Bachelor of Education programme for primary school teachers offered by the Samtse College of Education. Started in 1995, the DTEP is delivered primarily via printed text with a month-long residential school on a yearly basis.

In 2003, to improve its accessibility for students located in rural and inaccessible areas of Bhutan, an Internet-based component was added to the DTEP, using learning management system methods, computer-mediated conferencing and email. Recent self-reports of these tests have been candid in describing the lack of satisfaction with Web-based methods (Jamtsho & Bullen, 2007). Students appreciated the additional support and references found on the course website, though lamented the constantly poor, even worsening, Internet connectivity issues they encountered. Jamtsho and Bullen have concluded that, “traditional educational media should be used more intensively to enhance instructor-student and student-student interactions” (p. 157). In summary, e-learning has been found to be premature in Bhutan, an inappropriate transfer of technology to a developing country; and it has been shown that the traditional media are likely to have an ongoing importance in formal educational programmes for the foreseeable future, just as in India and Sri Lanka.

## **Rural Projects**

In non-formal distance education and training, new ICT methods are playing a substantial role in the development of emerging countries. Both India and Sri Lanka have made dramatic strides in using ICTs to reach out to their rural populations. For example, the M.S. Swaminathan Research Foundation (MSSRF) in India is a non-profit, grassroots organisation funded by government and UN agencies, and private donors (MSSRF, 2007). The Foundation practises a participatory, bottom-up approach to its development projects in rural settings, and has been a strong stakeholder since 1997 in the implementation of Virtual Knowledge Centers (VKCs) equipped with computers and Internet access, and communication systems for farmers and fishermen including the use of loudspeaker systems.

Managed by local communities, these centres play an important role in defining local learning needs. As stated on the MSSRF website, “[t]he main aim . . . is to empower vulnerable people in order to make better choices and achieve better control of their own development and to build skills and capacities of the rural poor with a view to enhancing livelihood opportunities.” In a similar initiative, an extensive non-governmental organisation (NGO) in Sri Lanka, *Sarvodaya*, has established 15,000 rural telecentres equipped with computers and Internet access. These too aim to develop local training programmes, and create knowledge networks based on local needs.

As indicated in the previous edition of this Journal (Berman, 2008), informal rural learning in India is also provided by community radio. This movement combines radio transmission in rural areas with local face-to-face discussions. In Pasatapur, *Deccan Development Society* is an NGO devoted to assisting illiterate and marginalised women. Village associations have emerged from the community work of local radio stations (UNDP & UNESCO, 2004). Radio programmes include talks, interviews, discussions, and songs. The work has resulted in improved knowledge of agricultural techniques, and women have learned about health issues, and tasks traditionally done by men. Community radio in India shows its role in raising social consciousness and knowledge exchange. Meanwhile, Sri Lanka has participated in the World Bank’s Global Distance Learning Network (GDLN), an ambitious initiative designed to encourage developing countries to develop local learning programmes. Practical usage of the GDLN, however, is expensive and requires proprietary hardware. Sri Lanka has also made lower-technology efforts to use computer- and Internet-based methods in rural education, using, for example, a bus to tour the country with basic educational materials (Jamtsho et al., 2007, p. 28).

## Conclusions

The above examples represent only a cross-section of the innovative uses of ICT and knowledge centres developed in South Asian education in recent years. Distance educators in India, Sri Lanka, and Bhutan have employed original means of providing distance education at the university level and in rural situations, and have concentrated on harnessing technologies which are easily accessible to their users, including radio, TV, and even buses. To date, their approaches have been sophisticated, if not perfectly tuned. Common weaknesses are a need to ensure adequate outreach to rural areas and provision of primary and secondary education. Technologies such as radio, which are far-reaching and effective for isolated peoples, have not received the attention that they deserve, whereas the up-and-coming technology, the Internet, which primarily benefits the privileged strata of society, has received widespread attention. Initiatives have lacked essential ingredients including the commitment and support of government, external donors, and strong teaching methods embracing a wide range of appropriate DE technologies.

The unfortunate conclusion is that DE technology in South Asia has so far been largely dictated by the needs of the more affluent, urban learners. More research and development is needed to assist South Asia in gaining policy-making insights in this respect. Nonetheless, as Baggaley and Ng (2005) have indicated, DE technology in Asia “is a ‘hot bed’ of research and development from which DE designers in the rest of the world stand to learn much.

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