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## ***Something Old – Something New***

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This issue of IRRODL marks a significant evolution in the development of your open access, peer-reviewed, international, online learning journal. Changes include new enhancements to our delivery model and some changes in the Journal's editorial personnel. However, rest assured that IRRODL remains committed to providing our distance education research community readers with a high quality, open access e-journal.

This issue marks the first change in editorship of IRRODL since its founding four years ago by Peter Cookson. Although I have taken over as Editor and Publisher, I am happy that Peter will continue supporting IRRODL as a member of our editorial board. I want to thank Peter for his considerable contribution in setting the vision and policy that has defined IRRODL, and for successfully leading the editorial and administrative activities that have created what is likely the mostly widely read, peer reviewed, distance education journal in the world.

This issue also marks the first in our new “continuous batch” publication model. Beginning this issue, IRRODL will be published when we have enough quality, peer reviewed main and research note articles, book reviews, and technical notes to compile an issue. This publication model allows for more issues, of reasonable size, to be published than the twice a year publication practice of the past. In addition, the new model will reduce the delay between submission, editing, and publication. Continuous batch production also allows us to retain the coherency of a complete issue, and yet also reduces an overabundant email “alerts” typical of publications that publish single articles as they are accepted. We anticipate publishing between three to five issues per year, but the exact number will depend on the number of quality submissions and our peer reviewers' availability and production capacity.

We are also striving to increase the numbers of special issues, specifically those that focus on geographic regions (we expect to have an Australian special issue early next year) or on topical issues related to significant happenings in open and distance learning. New guidelines related to process for editing a special issue are available from the IRRODL website.

Finally, although we continue to support full and open access to IRRODL, we now have paid subscribers to IRRODL. The reason why we have opted to solicit ‘paid subscribers’ is because the Canadian Social Sciences and Humanities Research Council has a program designed to support scholarly journals published in Canada. To be eligible to apply for this funding, however, IRRODL needs at least 200 ‘paid subscribers’ per year. Our current 7050 unpaid subscribers were deemed insufficient to demonstrate community demand! Thanks to the 280 distance educators who feel strongly enough about the value of Open Access and this journal, to donate a \$10.00 subscription fee, we met this arbitrary criteria for this year and have submitted our grant

application – though we are not at all certain how successful that application will be. The voluntary subscriptions also demonstrate our capacity to expand support for IRRODL beyond that generously provided by Athabasca University. However, we do not intend to compromise on policies or on practices that might restrict access to IRRODL. Indeed, we are very concerned that most other major distance education journals are now commercially published or published only in print format – thus restricting access to all and especially to those in developing countries. We do not intend to let this happen to IRRODL.

I have talked about a lot “what’s new,” but perhaps I should talk about “what’s old.” The structure of each IRRODL issue will continue to consist of feature articles in the Main Section. Each of these articles makes a significant advance to the field and adds new ideas to the literature. Our Research Note articles, on the other hand, generally confirm previous findings and thus add depth and breadth to existing literature. Both sections are rigorously peer reviewed, and both sections add value to our readership and our discipline. Each issue will also feature 1-3 book reviews.

Finally each issue will contain a Technical Notes feature. Technical Notes has proven to be one of IRRODL’s most popular downloads, offering readers practical reviews and evaluations of new and emerging educational technologies relevant to open and distance learning. Most of us feel somewhat intimidated by the rush of new products continuously being brought to market. These reviews and commentaries by Jon Baggaley, his colleagues and his students in Athabasca University’s Master of Distance Education program provide a commercial free commentary that can be searched from the IRRODL site whenever we feel technically challenged.

We also continue to insist upon distribution of high quality product. This practice means that we have a fairly high rejection rate as we sift through submissions to find and develop those manuscripts that make significant contributions and warrant the time of our busy reviewers and readers. We also continue the practice of using top-rated academics and practicing researchers to peer review our Main and Research Note content. The anticipated increase in number of issues and need to provide review experiences for new academics has created a need for new members of our editorial review team. If you would like to serve as a student or a regular editor for IRRODL articles, you are invited to send a copy of your résumé and an email detailing your experience, expertise, and interest to myself.

## **Highlights of Volume 5, Number 2**

### ***Main Section: Adding to the literature***

*Blended Learning and Sense of Community* – Fred Rovai and Hope Jordan present a study that examines the sense of community in blended learning environments. At least in the North American context, and likely globally, distance education techniques and tools are rapidly being adopted to enhance and allow time and place shifting for campus-based learners in what is often referred to as blended learning. Although considerable prior research has examined the development of community in distance education, little work has been done examining community formation in higher education blended learning environments. Rovai and Jordan stretch the boundaries on current literature on this topic. To add depth and breadth to this timely topic, we invited the reviewers of this paper to provide a commentary. Dan Eastmond of Western Governors University kindly stepped forward to write a commentary. In turn, the authors have also provided their response to Dr Eastmond’s commentary, on what I will editorialize as truly interesting research into blended learning environments how students create sense of community.

. *Peek Into the Life of Online Learning Discussion Forums* – In this article, New Zealand’s Mary Allen presents an evaluation tool to graphically display social communication among participants in asynchronous discussion groups. This approach adds an easy to use graphic representation of online dialogue that plays such an important role in much online education models in use today. Much research has focused on extracting meaning, insights, and mechanisms to improve learning from computer conferencing transcripts. Unfortunately, much of this work is very time intensive. The development of visualization tools that highlight the extent and type of interaction may well develop into easy-to-use and informative tools that make a difference in practice.

*Washington Online Virtual Campus: Infusing Culture in Dispersed Web-based Higher Education* – Shalin Hai-Jew, a seasoned distance educator who is just completing her doctorate in Seattle, USA, examines cultural implications in organizing distance education consortiums. The cost of developing and maintaining distance education programs can be prohibitive for single institutions. Thus, there is considerable interest in consortiums to share financial expense and risk, and to leverage advantages of particular institutional skills and assets. Hai-Jew examines the implications of such a consortium and provides suggestions for developing a “common culture” that recognizes difference among different institutions, yet holds the consortium together enough to create and sustain an effective organization.

*Interaction and Immediacy in Online Learning* – Robert Woods and Jason Baker provide a theoretical contribution that first overviews and then critiques our perennial focus on interaction in distance education. By highlighting the notion of immediacy, they argue that it is not interaction itself that leads to learning, but rather the nature and affective components of that interaction. They provide a new learner-centered model of interaction that shows interaction relationships between a learner and their community, context, the instructor and content.

### ***Research Notes: Supporting the literature***

*Faculty Opinions on Introducing e-Learning at the University of Bahrain* – Muain Jamlan’s paper offers readers the results of a internal study undertaken at the University of Bahrain designed to examine faculty’s perceptions of e-Learning. Like other institutions of higher education the world round, the University of Bahrain is seeking to lay the foundation to support a coherent system to deliver campus-wide e-Learning initiatives. Clearly, designing such a comprehensive e-learning system entails that the necessary resource and human infrastructure are in place to make it happen. Jamlan offers readers his perspectives on the challenges faced at his university, and his institutions’ attempts at developing a workable and cost effective plan to incorporate e-learning into mainline campus activities.

*Open University and Distance Education Coordination: Strategies to Consolidate Distance Education at the National Autonomous University in Mexico* – Citlalli Berruecos’s paper describes how Mexico’s flagship research university, UNAM, has consolidated its distance learning departments and expanded its e-Learning initiatives on that campus. It describes, in broad detail, the three initiatives used to achieve the institutions objectives. These deal with developing an open source Learning Management System (LMS); changing the administrative structure of the University to support consolidation; and the development of a high-tech center to ensure that UNAM has the technical infrastructure and human resource support system needed to sustain the effort. The paper also examines team structures typically used in corporate settings, the drivers of the change, and the importance of clearly defining goals across the institution.

*Distance Education and Case for Two Different Distance Education Courses* – Christos Pierrakeas, Michalis Xenos, Christos Panagiotakopoulos, and Dimitris Vergidis examine and compare the causes of student drop out at Greece’s Hellenic Open University in two fundamentally different courses: an undergraduate course in computer technology, and a graduate course in education. Like previous research, it reveals challenges faced by busy adults undertaking higher education studies for the first time (e.g., due to juggling family obligations and work commitments, students age 30 – 39 are more at risk for dropping out than other student populations; students who have a graduate degree tend to be less inclined to drop out, etc.). It also illustrates how learners, throughout the world, provide very similar reasons for dropout, and thus give us insights into ways to alter our program structures to accommodate learner constraints.

## ***Departments***

Two book reviews are included in this issue. Insung Jung reviews *The Advancing Online Learning in Asia*, co-edited by Murphy, Shin and Zhang, of the Open University of Hong Kong. The second, *Distance Education and Distributed Learning*, edited by Vrasidas and Glass, is reviewed by India’s Ramesh Sharma.

Finally, we wrap up this issue with the latest installment of Dr. Jon Baggaley’s Technical Notes, one of IRRODL’s most popular downloads.

To finish up, I’d like to thank IRRODL’s readers for their support of this open access e-journal. We feel it makes an important contribution to the field of distance and open education research, theory, and practice. I’m glad you are here to see us grow and expand in new directions in our fifth year of publication. I am also proud to be the new editor of IRRODL. It has truly been an eye-opener to witness all the work, by IRRODL’s many contributors, in bringing each issue to your screen.

Terry Anderson

*August 14, 2004*



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August – 2004

## ***Blended Learning and Sense of Community: A comparative analysis with traditional and fully online graduate courses***

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### **Abstract**

Blended learning is a hybrid of classroom and online learning that includes some of the conveniences of online courses without the complete loss of face-to-face contact. The present study used a causal-comparative design to examine the relationship of sense of community between traditional classroom, blended, and fully online higher education learning environments. Evidence is provided to suggest that blended courses produce a stronger sense of community among students than either traditional or fully online courses.

**Keywords:** Blended learning; sense of community; higher education; online learning; computer-mediated communication; faculty training

### **Introduction**

Times are changing for higher education. From the de-emphasis on thinking about delivering instruction and the concurrent emphasis placed on producing learning, to using technology to expand distance education, to the recognition of the importance of sense of community, we are witnessing a transformation of higher education. A decade ago, Davis and Botkin (1994) wrote:

*[w]ith the move from an agrarian to an industrial economy, the small rural schoolhouse was supplanted by the big brick schoolhouse. Four decades ago we began to move to another economy but we have yet to develop a new educational paradigm, let alone create the ‘schoolhouse’ of the future, which may be neither school nor house (p. 23).*

Today, we appear to be well along the road of creating that new schoolhouse and, as Davis and Botkin predicted, it is not constructed exclusively of bricks and mortar.

### **Producing Learning**

Barr and Tagg (1995) described the first focus of change as a paradigm shift in which universities were re-inventing their purpose and thinking less about delivering instruction and more about

producing learning in student-centered environments. According to Barr and Tagg, universities are moving away from a faculty-centered and lecture-based paradigm to a model where learners are the focus, where faculty members become learning environment designers, and where students are taught critical thinking skills. Thus, the role of professors in the new schoolhouse is to serve their students by ensuring student learning is of paramount importance. They support their students by attending to their intellectual growth and self-autonomy, and by instilling in them an awareness of important social issues, thus supporting their ability to become more productive members of society as lifelong learners working toward the common good.

Gardiner (1994, 1998) endorsed the need for classroom change to allow students to acquire more significant kinds of cognitive learning, particularly critical thinking skills. He pointed out that research shows the ability of university students to reason with abstractions is strikingly limited. He argued that many university students have not yet reached the formal operational level of cognitive development. Consequently, revisions to curricula, instructional and advising practices, and campus climates are needed to improve student learning and to promote student growth. If we envision a university education as education in the conduct and strategy of inquiry itself, then the university becomes society's unique site where students learn how to think, learn, produce, and evaluate knowledge, providing the basis for lifelong, independent learning (Rury, 1996).

An important implication of this shift is the need for a recommitment to creating an ideal learning environment for students and employing new pedagogies and technologies, where appropriate. In implementing change, one reality seems clear. Universities will face more competition to attract quality-conscious students and thus cannot afford to underestimate the depth and speed of the changes required to remain competitive. Change is not easy, however, and there is considerable pressure from within the university to preserve the status quo, particularly from faculty members. In many cases, professors teach as they were taught and resist change (Gardiner, 1998), often using academic freedom as an academic crutch. Since faculty promotion and tenure, at present, are largely based on research and publication, some professors zealously feel that they should not take away from their research or writing time to change curricula and pedagogy, for the potential rewards are not worth the time or risk to them. Consequently, many professors still use the traditional lecture as their instructional strategy of choice.

Several learning theories are particularly relevant to the learning-centered university classroom. Approaches to learning that promote social constructivism, or learning within a social context, and that feature active group construction of knowledge, rather than transfer of knowledge, provide ideal learning environments for the new schoolhouse. These approaches to learning are highly consistent with the views of Barr and Tagg (1995), who wrote that the new educational paradigm "creates environments...that bring students to discover and construct knowledge for themselves" (p. 15).

## **Distance Education**

A second focus of change is the shift from providing exclusively traditional classroom instruction to reaching out to students by delivering courses at a distance using technology. Distance education is already a pervasive element of higher education and it continues to rapidly expand. Research, however, suggests that online courses are not suitable for all types of students and faculty. Collins (1999) noted that students and teachers react to new educational technologies with varied emotions, ranging from enthusiasm to disabling fear. Abrahamson (1998) reported that distance education required students who were self-regulated and independent. Marino

(2000) also discovered that some students experienced difficulty adjusting to the structure of online courses, managing their time in such environments, and maintaining self-motivation.

The text-based computer-mediated communication (CMC) that is used by Internet-based e-learning systems for discussion board and email discourse is a powerful tool for group communication and cooperative learning that promotes a level of reflective interaction that is often lacking in a face-to-face, teacher-centered classroom. However, the reduced non-verbal social cues in CMC, such as the absence of facial expressions and voice inflections, can generate misunderstandings that adversely affect learning.

Sikora and Carroll (2002) reported that online higher education students tend to be less satisfied with totally online courses when compared to traditional courses. Fully online courses also experienced higher attrition rates (Carr, 2000). The research is mixed regarding the reasons for these higher attrition rates, however. Hara and Kling (2001), conducting a study of online courses, found that feelings of isolation were an important stress factor for online students, but not the primary factor as frequently mentioned in the professional literature. Rather, “[s]tudents reported confusion, anxiety, and frustration due to the perceived lack of prompt or clear feedback from the instructor, and from ambiguous instructions on the course website and in e-mail messages from the instructor” (p. 68). Thus, it may be that the reason some online courses suffer more dropouts is less related to the course delivery medium and more related to the online course design and pedagogy employed by some online faculty who have limited skills in using CMC to facilitate learning and to nurture sense of community.

## **Sense of Community**

The third major focus of change in higher education is the increased attention given to the importance of a strong sense of community. McMillan and Chavis (1986) offered the following definition of sense of community, “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (p. 9). Sergiovanni (1994) stressed the need for authentic community in schools, a tie binding learners and teachers through shared values, ideals, and goals.

Research evidence suggests that low sense of community is related to two student characteristics associated with attrition: student burnout (McCarthy, Pretty, and Catano, 1990) and feelings of isolation (Haythornthwaite, Kazmer, Robins, and Shoemaker, 2000; Morgan and Tam, 1999). Tinto (1975) argued that insufficient interactions of higher education students with peers and faculty and differences with the prevailing value patterns of other students, are also likely to result in dropouts. In other words, students who feel they do not *fit in* and have low sense of community tend to feel isolated and are at-risk of becoming dropouts.

## **Blended Learning**

Blended learning is an important building block of the new schoolhouse that offers students both flexibility and convenience, important characteristics for working adults who decide to pursue postsecondary degrees. According to Colis and Moonen (2001), blended learning is a hybrid of traditional face-to-face and online learning so that instruction occurs both in the classroom and online, and where the online component becomes a natural extension of traditional classroom learning. Blended learning is thus a flexible approach to course design that supports the blending



of different times and places for learning, offering some of the conveniences of fully online courses without the complete loss of face-to-face contact. The result is potentially a more robust educational experience than either traditional or fully online learning can offer.

From a course design perspective, a blended course can lie anywhere between the continuum anchored at opposite ends by fully face-to-face and fully online learning environments. The face-to-face component can be either on the main university campus or the professor can travel to a remote site in order to meet with students. Martyn (2003) described a successful blended learning model. It consists of an initial face-to-face meeting, weekly online assessments and synchronous chat, asynchronous discussions, e-mail, and a final face-to-face meeting with a proctored final examination.

Dziuban and Moskal (2001) reported that blended courses at the University of Central Florida replaced face-to-face class time with online learning so that a three-hour course occupied only one hour of actual face-to-face classroom time. Such courses allowed the weekly operation of multiple classes in a classroom previously occupied by only one course, thus making more efficient use of existing university infrastructure. Moreover, they reported that blended courses, when compared to traditional courses, had equivalent or reduced student withdrawal rates as well as equivalent or superior student success rates.

Voos (2003) suggested that it is unlikely that the *blendedness* (sic) makes the difference in such courses, but rather the fundamental reconsideration of course design in light of new instructional and media choices and the learning strengths and limitations of each. Joyce Neff (1998), a professor of writing, found that teaching a blended course had profound effects on her teaching. She wrote: “[t]he ways I perceived and manipulated the medium, the ways I imagined the subjectivities of my students, and the ways intermediaries affected my authorities all influenced my writing pedagogy” (p. 154). Privateer (1999) summarized the direction needed with the following passage:

Opportunities for real change lie in creating new types of professors, new uses of instructional technology and new kinds of institutions whose continual intellectual self-capitalization continually assures their status as learning organizations (p. 72).

## **Purpose**

Prior research has not examined sense of community in higher education blended learning environments. Consequently, the purpose of the present study was to examine how sense of community differed across fully traditional, blended, and fully online courses. The research hypothesis was that sense of community would be strongest in the blended course. The rationale was that a combination of face-to-face and online learning environments provides a greater range of opportunities for students to interact with each other and with their professor. These interactions should result in increased socialization, a stronger sense of being connected to each other, and increased construction of knowledge through discourse, thus providing stronger feelings that educational goals were being satisfied by community membership.

## Methodology

### *Participants*

Study participants consisted of 68 graduate students enrolled in three graduate-level education courses during the same semester. All participants were employed as full-time K-12 teachers seeking a Master's degree in education. The overall volunteer rate was 86 percent. By course, the total number of students enrolled, the number of students who volunteered, and the volunteer rates were as follows: a) traditional course, 26 enrolled, 24 volunteered, 92.31 percent volunteer rate; b) blended course, 28 enrolled, 23 volunteered, 82.14 percent volunteer rate; and c) fully online course, 25 enrolled, 21 volunteered, 84.00 percent volunteer rate.

### *Setting*

All three courses were presented by a small accredited university located in an urban area of southeastern Virginia. These courses were selected for inclusion in this study because they were each taught by full-time professors of education with reputations for being superb teachers universally well regarded by their students and who valued interaction and collaborative group work. The professors were also noted for possessing such personal qualities as sociability, sensitivity, discernment, concern, and high expectations regarding student achievement.

The traditional course presented instruction on educational collaboration and consultation, and met Wednesday evenings throughout the semester in a classroom on the main university campus. Students resided in the same geographical area. Each class meeting lasted approximately three hours for total face-to-face time of approximately 48 hours. Online technologies were not used in this course. The professor employed a mix of textbook study assignments, lecture with class-wide discussions, some collaborative group work, and authentic assessment tasks requiring individual work. The group work involved two to three students working collaboratively on a single project assigned by the instructor.

The blended course covered legal and ethical aspects associated with teaching disabled students and consisted of both face-to-face and asynchronous online components. Like the traditional course, students resided in the same geographical area. Assignments emphasized practical application, authentic tasks, collaborative action research, and group projects, all complemented with textbook readings. The course started with an initial face-to-face session followed by two Friday evening and Saturday sessions, spread evenly throughout the 16-week semester, for a total of approximately 14 face-to-face hours. These sessions were conducted either on the main campus or at remote sites, chosen based on their accessibility to students and included activities such as guest speakers, group project presentations, group simulations, interactive videos, and discussions. The online component was delivered using the *BlackboardSM* e-learning system, which allowed for presentation of online content and the extensive use of student-student and student-professor asynchronous dialogue as extensions of the face-to-face sessions.

The fully online course covered curriculum and instructional design and was delivered entirely online using the *BlackboardSM* e-learning system. Unlike the other two courses, students were geographically dispersed throughout the U.S. The online professor used a mix of textbook study assignments, collaborative online discussion topics using group discussion boards consisting of 12 to 15 students each, and authentic assessment tasks requiring individual work. The only collaborative group work in the course was the weekly problem-oriented discussion topics posted

by the instructor. These topics required students to interact with each other as they moved toward achieving consensus on solutions to the issues raised by the instructor. In order to encourage participation in the discussion boards, active and constructive online interactions accounted for 10 percent of the course grade.

## **Instrumentation**

The Classroom Community Scale (CCS) was used to measure connectedness and learning (Rovai, 2002). This instrument consisted of 20 self-report items, such as *. feel isolated in this course* and *. feel that this course is like a family*. Following each item was a five-point Likert scale of potential responses: *strongly agree, agree, neutral, disagree, and strongly disagree*. The participants check the place on the scale that best reflects their feelings about the item. Scores are computed by adding points assigned to each of the 20 five-point items, with 10 items allocated to each subscale. These items are reverse-scored where appropriate to ensure the least favorable choice is always assigned a value of 0 and the most favorable choice is assigned a value of 4. The connectedness subscale represented the feelings of students regarding their cohesion, community spirit, trust, and interdependence. The learning subscale represented the feelings of community members regarding the degree to which they shared educational goals and experienced educational benefits by interacting with other members of the course. Scores on each subscale can range from 0 to 40, with higher scores reflecting a stronger sense of classroom community.

The results of a factor analysis confirmed that the two subscales of connectedness and learning were latent dimensions of the classroom community construct (Rovai, 2002). Cronbach's coefficient alpha for the full classroom community scale was .93. Additionally, the internal consistency estimates for the connectedness and learning subscales were .92 and .87, respectively. In the present study, Cronbach's coefficient alpha for the full classroom community scale and the connectedness and learning subscales were .92, .90, and .84, respectively.

End-of-course student evaluations were also used to obtain anecdotal data regarding student perceptions of their respective courses. These evaluations are voluntary on the part of each student and are submitted anonymously directly to the university. Instructors receive written copies of comments disaggregated by course after course grades are submitted to the university registrar.

## **Procedures**

The CCS was completed by the traditional and blended course participants during face-to-face meetings proctored by the course's professor while fully online course participants completed the CCS via an online survey. All participants completed the pretest during the second week of the semester and the posttest during the final two weeks of the semester. Participants were unaware of their final course grades when they completed the CCS.

## **Design and Data Analysis**

A causal-comparative design was used to determine whether the mean differences in sense of community measured at the end of traditional, blended, and fully online graduate courses, as reflected by the composite dependent variable of the two CCS subscales of connectedness and learning, were larger than expected by chance after adjusting for preexisting differences in the two subscales. A multivariate analysis of covariance (MANCOVA) was used to analyze the data

in order to provide statistical matching of groups based on the pretest results, since random assignment of participants to groups was not possible in this study. Effect size was calculated using the eta squared ( $\eta^2$ ) statistic and interpretation was based on Cohen’s (1977) thresholds of .01 for a small effect, .06 for a moderate effect, and .14 for a large effect. Assumptions tested and specific statistical procedures used in the analyses are described in the following results section.

## Results

A total of 51 (75.0 percent) of the students were females and 17 (25.0 percent) were males. Overall, 13 students (19.1 percent) reported their age as being 25 years old or less, 16 (23.5 percent) were between 26 and 30, 18 (26.5 percent) were between 31 and 40, 18 (26.5 percent) were between 41 and 50, and 3 (4.4 percent) were over 50 years old. For ethnicity, 53 (77.9 percent) reported being white, 10 (14.7 percent) were African-American, 2 (2.9 percent) were Hispanic, and 3 (4.4 percent) were bi-racial. Chi-square contingency table analysis provided evidence that there were no significant differences in the composition of the three courses by gender, age, or ethnicity. The pooled pretest means (with standard deviations in parentheses) for the connectedness and learning subscales were 28.75 (4.90) and 32.53 (3.66), respectively, while the pooled posttest statistics were 31.57 (6.18) and 34.44 (4.67), respectively. The means and standard deviations for the two subscales by course are displayed in Table 1.

**Table 1.** Descriptive Statistics

Variable	<u>Pretest scores</u>		<u>Posttest scores</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Traditional course ( <i>n</i> = 24)				
Connectedness	32.63	4.12	32.50	4.85
Learning	34.38	2.39	35.88	3.55
Blended course ( <i>n</i> = 23)				
Connectedness	26.70	4.10	32.70	4.42
Learning	30.57	2.76	34.26	3.74
Fully online course ( <i>n</i> = 21)				
Connectedness	26.57	3.83	29.29	8.45
Learning	32.57	4.61	33.00	6.20

*Note:* *N* = 68. Scores can range from 0 to 40 for each variable, with higher scores reflecting a stronger sense of classroom community.

A one-way MANCOVA was conducted on two dependent variables: posttest connectedness and posttest learning. The independent variable was type of course (traditional, online, and blended).

The two covariates were pretest connectedness and pretest learning. Data screening revealed no univariate or multivariate within-cell outliers at  $p < .001$ . Results of evaluation of normality, linearity, singularity, and multicollinearity were satisfactory. Table 2 displays all Pearsonian bivariate correlations for the dependent variables and covariates. The homogeneity of slopes assumption was tested by examining two interaction effects for each dependent variable: type of course x pretest connectedness and type of course x pretest learning. The assumption was tenable although the partial  $\eta^2 = .11$  for the type of course x pretest connectedness interaction associated with posttest connectedness was of medium size, a cause for some concern. The assumption of homogeneity of variance-covariance matrices was not met, Box's  $M = 16.06$ ,  $F(6, 96620.57) = 2.56$ ,  $p = .02$ . Consequently, Pillai's criterion, instead of Wilks' lambda, was used to evaluate multivariate significance because of its robustness to moderate violations of this assumption.

**Table 2.** Inter-correlations

Variable	1	2	3	4
1. Pretest connectedness	1.00	.25	.57	.41
2. Posttest connectedness		1.00	.57	.85
3. Pretest learning			1.00	.67
4. Posttest learning				1.00

Note:  $p < .05$ .

The MANOVA revealed that the combined dependent variables were significantly affected by course type, Pillai's trace = .23,  $F(4, 126) = 4.09$ ,  $p = .004$ , partial  $\eta^2 = .12$ . Tests of between-subjects effects were also conducted to investigate the impact of type of course on individual dependent variables. Both connectedness,  $F(1, 63) = 9.37$ ,  $MSE = 20.70$ ,  $p < .001$ , partial  $\eta^2 = .23$ , and learning,  $F(1, 63) = 4.74$ ,  $MSE = 11.06$ ,  $p = .01$ , partial  $\eta^2 = .13$ , differed significantly.

The blended course possessed the highest estimated marginal mean (i.e., the adjusted posttest mean) of the connectedness variable ( $M = 34.91$ ), followed by the traditional course ( $M = 30.78$ ) and the online course ( $M = 28.83$ ). Based on these estimated marginal means and the results of Sidak's  $t$  test, which adjusts the observed significance level for the fact that multiple comparisons are made, participants in the blended course scored significantly higher on the connectedness posttest, after adjustment based on pretest results, than either participants in the traditional course,  $p = .04$ , or the online course,  $p < .001$ . The difference between participants in the traditional course and the online course was not significant. The blended course also possessed the highest estimated marginal mean for learning ( $M = 36.17$ ), followed by the traditional course ( $M = 34.03$ ) and the online course ( $M = 33.01$ ). Based on Sidak's  $t$  test, the participants in the blended course scored significantly higher on learning than those in the online course,  $p = .01$ , after adjustment based on pretest results. The differences for other pairwise comparisons were not significant.

## Discussion

The present study examined the relationship of sense of community between traditional classroom, blended, and fully online higher education learning environments. After adjusting for course pretest differences, the combined dependent variable of connectedness and learning differed significantly among the three courses. The effect size, as measured by partial  $\eta^2$ , was medium. The blended course possessed a significantly higher adjusted mean connectedness score than either the traditional or online courses with a large effect size. The blended course also possessed a significantly higher adjusted mean learning score than the online course, but with a medium effect size.

An examination of the variability of connectedness and learning scores by course, as reflected by their standard deviations as well as by the significant differences found in their variance-covariance matrices, showed that the scores of online course students were substantially more diverse than either the two other courses. Moreover, the distribution of these two community variables among online students revealed a decidedly negative skew. These results suggest the existence of one or more confounding variables. Such variables are likely to be related to student characteristics, such as learning style preference, that facilitate the development of strong feelings of community in some online students, while other students remain at a psychological distance from their peers in the same learning environment.

Often cited characteristics of successful online students include interest in the material taught, self-motivation, independent and self-directed learner, critical thinker, family support, positive and timely feedback, accepts responsibility for own learning, organized, and practical knowledge in the use of computers (Irizarry, 2002). Student deficiencies in any of these factors could possibly result in a weak sense of community and explain the relatively large variability and negative skew of sense of community variables among students in the online course. Since students in the blended course exhibited similar sense of community and variability as students in the traditional course, offering the convenience of fully online courses without the complete loss of face-to-face contact may be adequate to nurture a strong sense of community in students who would feel isolated in a fully online course.

The ability of the blended course to generate stronger feelings of community than the fully online course was expected, based on the frequent online student complaint of feeling isolated (e.g., Haythornthwaite et al., 2000; Morgan and Tam, 1999). Additionally, the frustrations some students feel in fully online courses, particularly those who are dependent learners, are less self-regulated, and need frequent direction and reinforcement from a visible professor, are eased when combined with periodic opportunities for face-to-face interactions. Fully online learning environments also require technological ability and frequency of usage that varies from student to student based on individual characteristics. Accordingly, all these differences influence the benefits that each student derives from online environments and help explain why some students are not fully satisfied with online courses and feel isolated. Likewise, discussions in traditional classrooms, where vocal students can dominate and discussions may be superficial, spontaneous, and limited, can frustrate those students with a more introverted personality and thus help explain why sense of community in the blended course was stronger than in the traditional course.

All student comments regarding the blended course were positive. Many initially expressed concern regarding the online component of the class at the initial face-to-face session. They were not sure that they could handle the technological aspects and the required independent learning. They were also uncertain how they would feel about communicating with other students and the

professor online. Nonetheless, students predominantly ended up expressing the benefits of the online portion of their classes. As one student explained in the anonymous end-of course student evaluations of the course, “As a teacher, I would never have made it through this semester without the practical guidance of this course along with the freedom of the online component.” Another student wrote: “I feel the experiences this program has given me have better prepared me for the classroom than any lecture I had in my traditional undergraduate work, and I’ve been teaching for six years.”

Students felt that the authentic nature of the assignments tied nicely with what they were doing in their own classrooms everyday as practicing K-12 teachers. One student wrote, “this course was rigorous, yet extremely workable for teaching professionals because the assignments directly impacted my teaching practices during the year.” Several blended students also commented that they would not have been able to complete the course without the online component, as they needed to continue working while attending school. They also pointed out, however, that the face-to-face weekend classes were a valuable component both academically and in building professional relationships and a strong sense of community. Students often left class on Saturday and tried a new technique, such as implementing a new behavior management plan or using a new academic strategy, the very next week. Having strategies modeled in class, participating in simulations and group work, as well as face-to-face feedback from peers and instructors, were all considered important to the overall learning experience. Although such behavior may have occurred in the other two courses, students did not mention it in their end-of-course evaluations.

Students provided a mix of negative and positive comments about the fully online course. Negative comments addressed the limitations of the text-based nature of CMC. A typical negative comment was:

Trying to understand abstract concepts from only printed words in the discussion forums was and is still difficult for me. I have to be able to visualize within a context. I need a more visual approach. I need the professor to draw pictures and diagrams or show slides as he speaks.

Additionally, there were some student-professor misunderstandings, possibly due to the reduced social cues in text-based discussions. One student wrote to the professor: “Some of your responses to other students appeared sharp and frank. So instead of calling you, I just depended on my own wit and received help from my colleagues.” The professor’s view was that his communicator style was direct, concise, and to the point in order to minimize misunderstandings and manage time in responding to numerous messages each day. There was no evidence of such misunderstandings in the blended or traditional courses, suggesting that the opportunity for face-to-face discussions allowed everyone to become acquainted with each other, which may have assisted in the interpretation of subsequent text-based communication in the online course.

Positive comments regarding the fully online course centered on the value of reflective thinking and the extra time to process information. “I noticed that I process the information better when it is presented online, because I have to analyze it myself before I hear someone else’s interpretation of what I am learning,” was one online student’s comment. The extra time to process information allowed students to give more in-depth answers and promoted critical thinking skills. However, the professor’s skills in facilitating online discussions are essential to the success of the course. A comment written by one student underscores this point:

*[The professor]* corrected gaps in understanding immediately when they occurred on Blackboard. This was of great benefit, especially to those individuals who spent large amounts of time on Blackboard. We were able to discuss at length with him any misconceptions or errors in lingo. The level of difficulty of this course is such that the instructor must be vigilant, pointed, and on top of the learners each step of the way, if concepts are to be purely assimilated and applied. I feel that face-to-face is ideal for teaching a course as this, but if (and ONLY if) an instructor can master the online format, as our professor has, is it doable as an online course.

Course quality can vary due to a number of factors including available technology and the capabilities of professors who design and teach the courses. While technology has the great potential to enhance student's active learning, the use of technology requires a compatible pedagogy to achieve its benefits. Consequently, within each type of course, sense of community among students is likely to co-vary based on the values and abilities of the professor.

Such findings are suggestive of the need for faculty training and university faculty development centers. A designated university-wide faculty development center with a learner-centered philosophy is essential to the success of any technology-based distance education program (Bakutes, 1998). Additionally, issues such as tenure, merit, and promotion policies, faculty workload, and the changing roles of professors need to be revisited and revised, as needed, based on the new higher education schoolhouse. Faculty promotion and tenure committees need to adapt promotion and tenure criteria based on the learning paradigm. According to Senge (1990), as cited in Barr and Tagg (1995), changes to the university in support of the learning paradigm are as important as the decision or desire to shift towards the learning paradigm. Consequently, all issues regarding change, to include any moves toward increased use of blended learning, need to be addressed by the school's strategic planning process.

The ability to generalize findings beyond the present study is limited because only three courses at the same university were sampled and the learner characteristics, course content, course design, and pedagogy used by the professors in the present study may not be representative of other professors and other settings. Additionally, the researchers exercised no experimental control over the courses examined in the present study and cause-and-effect relationships were not confirmed.

## **Conclusion**

The blended concept of learning is highly consistent with the three areas of change identified in the introduction – thinking less about delivering instruction and more about producing learning, reaching out to students through distance education technologies, and promoting a strong sense of community among learners. Indeed, the concept of blended learning may be a synthesis of these areas as the learning environment becomes more learning-centered, with emphasis on active learning through collaboration and social construction of understanding. Such a concept is moving toward O'Banion's (1997) vision of a learning college as a place where learning comes first and educational experiences are provided for learners anyway, anyplace, and anytime. Graham B. Spanier, president of The Pennsylvania State University, referred to this convergence of online and traditional instruction as the single-greatest unrecognized trend in higher education today (Young, 2002).



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August – 2004

## ***Reviewer Commentary to “Blended Learning and Sense of Community”***

**Daniel V. Eastmond**

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Let me begin by saying that this article was a pleasure to review. It was well-written, well-researched, and makes an important contribution to our field. I have organized my commentary into three areas: 1) response to the article itself; 2) reflection upon my own relevant experiences; and 3) a perspective from a virtual university that does not offer blended learning.

### **Response**

I agree with the author that the blended learning model provides the best of both worlds: the interpersonal connections and relationship establishing experience through face-to-face encounters, as well as the sustained academic dialog with peers and instructor(s) online throughout the course. Since the research presented here dealt with courses about different subjects, conclusions about actual learning performance and mastery of material will differ based upon the content and methods that these courses employed. Readers must remember that the valid conclusions of this research are limited to students self-report of their sense of community and amount of learning that took place. The correlation between these learning scores and actual student performance would be a good follow up project.

We need further research in our field that investigates the effectiveness of various instructional formats, as presented in this study, including:

- Weekly class sessions versus weekend programs (with or without a distance component)
- These same formats supplemented by online discussion boards
- Several weeks of face-to-face sessions that shift to months of online with a closing in-person closure class
- Putting the face-to-face session in the middle of the course for formative evaluation purposes, rather than at the end
- Combining blended sessions with the beginning, middle, and final face-to-face class in an abbreviated (50 minutes to three hour) length

Such research would reveal whether all of the advantages the author outlines still hold true in various configurations, and which were more effective than others.

## **My Journey**

I began my online distance experience as a doctoral student supporting the launch of blended learning courses in the early 90s at Syracuse University. Most students and professors knew each other already from other courses, but the initial session did welcome a few new-comers and was directed toward the curiosity and anxieties associated with continuing our academic work online. Learning how to use the computer conferencing software in a lab environment was much easier than it would have been at a distance, especially with these technically unsophisticated users. We conducted a mid-course half-day session that allowed people to gather again and evaluate their experiences so that we could make mid-course corrections. The response was positive and by the end of the semester, both faculty and students were pleasantly pleased how effective a blended online course could be. Several years later, I taught blended courses as a faculty member at the University of South Dakota. One course was about distance education; it included purposely designed sessions of teaching from different interactive television (ITV) sites, as well as a six-week long stint of strictly online fare with a closing face-to-face session. This not only brought the class together, but also provided the first-hand exposure to various distance delivery systems that students need to experience. In other courses, I found it convenient to schedule independent study, ITV sessions from other campuses, and online threaded discussion sessions during the semester when I knew that I would be out of town. This enriched the learning experience of students whose only background was face-to-face, opening them to the splendor of distance education. (An important part of course orientation was the provision of essential training on ITV and Web communication tools to these on-campus students so that they could effectively participate in these sorts of sessions).

In contrast, several of my experiences have been with programs that were offered entirely at a distance, including my current position at Western Governors University (WGU). WGU is a competency-based national higher education institution offering distance programs in information technology, business, and teacher education. My first completely online course was from the Open University of the United Kingdom, while at Syracuse University, and it created a totally new paradigm of instructional possibilities as I interacted with over 25 students and four moderators on five continents. SUNY Empire State College's Center for Distance Learning, where I provided academic support, engaged in some of the earliest online distance programs (without blended opportunities), and the tremendous growth and satisfaction of their student population (which includes students nationally and from other colleges through the SUNY Learning Network) is one of the most successful distance enterprises in the United States. Finally, I was sold on the efficacy of strictly online distance courses when I taught four courses for Boise State University's instructional and performance technology program over a several year period. With students located throughout the nation (including Alaska), a graduate assistant in another state, and the rich learning environment created by the extensive experience base of working professionals who applied course concepts immediately to their daily practice, created an exhilarating, quality education experience, unrivaled by most face-to-face classrooms in which I have participated.

## **Why Strictly Distance Delivery?**

So the question remains: Why would an institution run a strictly online distance program if the hybrid format is superior for both community and learning? First and foremost is access – the aim to provide an education to individuals that is independent of time and place, so that working adults can fit this opportunity within the demands of their busy lives. In regard to my particular institution, WGU, blended courses would seem to prohibit students' rapid self-paced movement

through modularized learning resources to refresh and develop just the needed competencies because of the time, place, and content structures the course demands. Another important aspect, diversity, emerges from distance programs that are national, even international in scope. These programs allow people from many professional areas, geographic regions (states, provinces, or nations), urban and rural, cultural and political, age and ethnicity, and even people employed during different work shifts to interact together online. The result is good andragogy: adults bringing their expertise to the collective learning environment to address and apply the content of instruction. These factors of access, diversity, and tailored instruction create a quality distance education experience quite apart from blended instruction.

Another question arises: How do virtual institutions compensate for a weaker course community than would be present in a blended format (as the article argues)? My institution and others are taking programmatic and even institutional initiatives to create and sustain learning communities and student affiliation and loyalty throughout the time a student pursues their degree. This includes at WGU: 1) providing orientation courses that build community, technical, academic, and lifestyle skills to become a successful distance student; 2) fostering cohort groups so that peers work together through a great deal of their degree, supporting and being accountable to each other; 3) mentoring with a dedicated faculty member who works directly with the student throughout their degree; and 4) through a competency-based approach that places performance criteria as the basis of student progress, allows flexible use of learning resources, and acknowledges prior learning.

In conclusion, blended learning courses certainly prove to be effective for both community development and learning. This article corroborates the growing scholarly support of this with some solid evidence. Such in-person sessions are however “costly” in terms of overall access by the length of distance to which such practices restrict courses, programs, and the institution. There are compensating activities that can be intentionally incorporated that can make up for not having face-to-face sessions. At present, it seems that blended courses are most appropriately used within campus-based programs that are venturing into distance education as a means of warming up faculty and students to its possibilities. Such programs may never have the intention of hosting entirely distance offerings, and if so, blended learning courses are important in opening up additional access and providing some of the enhanced learning environments that are available through online communities. I do not predict that face-to-face learning will go away, but its prominence will diminish, as blended courses in all of their varieties become more of the norm. Of course, it will be interesting to see whether the same learning dynamics continue in blended courses as online technology becomes more ubiquitous and class members, students and faculty, become comfortable in community-building and learning strictly at a distance.



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August – 2004

## ***Authors' Response to Reviewer Commentary by Eastmond***

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We endorse the reviewer's comments regarding blended learning and the recommendations for follow-on research. Our intent, therefore, is to use the opportunity of this response to elaborate the answer to a rhetorical question presented by the reviewer and to suggest additional research.

### **Fully Online versus Blended Programs**

The reviewer asks: "Why would an institution run a strictly online distance program if the hybrid format is superior for both community and learning?" and then answers with the observation that "access" is key, as well as "rapid self-paced movement through modularized learning resources to refresh and develop just the needed competencies." We agree that the diverse locations of some students and/ or the purposes of some programs may not make blended learning feasible or desirable for all programs. However, a brief survey conducted by the authors of Internet promotional materials for online programs revealed that many institutions publicize convenience as the centerpiece of online distance programs, to include the use of the "no campus residency" claim as a marketing tool to attract more students. This promotional theme raises a significant criticism about distance education – some schools appear to emphasize convenience over quality. For example, one university's webpage included the following: "What makes [institution's name deleted] unique is that there are absolutely no campus residency or onsite requirements. All course work is done completely through the Internet with the guidance of faculty mentors, from the comfort and convenience of home or office. [Name deleted] is the first regionally accredited university in the country to make this type of learning environment available, particularly to those seeking doctoral degrees." That's it! No claims of a quality learning experience are made. Such language is seen as a reflection of the market-driven nature of distance education programs, in which schools are engaged in intense competition with each other. At issue is the extent to which marketing considerations are driving distance education course design.

We believe that the major criterion for designing distance education programs should be related to learning, not marketing. We also feel distance education programs should include an appropriate face-to-face component, if feasible and educationally relevant, even if this component only entails an initial campus residency at the beginning of a relatively lengthy and academically challenging program. Most regionally accredited doctorates in the U.S. of which the authors are aware, require campus residencies. If a centralized residency at the school's campus is not feasible, use of multiple decentralized residencies at diverse locations conducted by school faculty should be considered.

## **Follow-on Research**

The reviewer makes a good point regarding the need for further research on the area of “weekly class session versus weekend programs (with or without a distance component).” This issue was addressed when designing the components for the blended model described in our study. The needs of this specific group of students were considered when choosing the weekend format, as most of the students were full-time working teachers and some lived as far as 50 miles away from the meeting site. Consequently, this community of students felt that the Friday night/ Saturday sessions were their preference. However, in an effort to be flexible and meet the needs of various diverse groups of students, further research is appropriate regarding various options for in-person meeting days and times.

We recommend that gaps in learning and sense of classroom community by race in fully online and blended learning environments also be added to this list of follow-on research. Our research provides evidence of the relationship between sense of classroom community and learning, and highlights the importance of community building. A recently completed study by one of the authors provides evidence to suggest that the racial achievement gap that has been widely reported in many traditional educational programs also exists in fully online university courses, and that this gap covaries with the classroom community gap (i.e., as the gap in classroom community gets smaller, so does the gap in achievement). Although the course sampled in the study included graded weekly group discussion topics, course assignments involved only independent work, which may have contributed to Black students possessing weaker sense of community and achieving lower grades than their White peers in the predominately White online environment (59 percent White; 37 percent Black; 4 percent other). Perhaps more collaborative group work and less independent work would have produced better results for minority students.

John Ogbu (1995), a noted University of California anthropologist, attempted to explain the academic underperformance of many minority students in traditional classrooms based on cultural and communication factors. He suggested that students enter the classroom with modes of interaction that reflect their home culture, and that often conflicts with the culture of the school. Since communication is central to educational processes, effective communication is essential to the reduction of potential problems associated with the clash of cultures in the classroom and to ensure the establishment of an appropriate teaching/ learning environment. This is particularly important in online programs, where communication is mostly limited to the written word and often represents the only contact between members of the classroom community. Ogbu theorized that the academic environment must be facilitated by cultural connections identifying and linking communication as a significant element in the teaching and learning process. As such, cultural contexts are essential to communication effectiveness.

Differences in cultural backgrounds and associated social values may be barriers to forming a strong sense of community and to academic success in online multicultural classroom environments. Consequently, racial issues that influence community in the traditional classroom environment can also affect the virtual classroom, despite the often heard assertion that the Internet erases racial differences and that people are more often judged on their ideas rather than their skin color. Some racial and ethnic groups, such as African Americans, place higher emphasis on communal values, which include knowledge that is valued, how learning occurs, and communication patterns of working together for the good of community (Flannery, 1995). While these values are not to be viewed as monolithic for an entire race of people, they have been proven valuable to note when educators are looking for pedagogical markers that differentiate the learning processes of African American groups who have little to no significant cultural contact

with the learning patterns of other cultures (Hale, 2001). The major implication for professors of African American students is to use a pedagogy that encourages them to explain their understanding of subject matter within a collaborative and cohesive group context.

The concept of schools as communities, each with its own school ethos and student support system, is particularly important in distance education where student persistence and learning are issues, and where mixed groups of students will have expectations arising from their own local communities that may differ with the accepted norms of schools from other communities. Perhaps the achievement gap can be closed by designing and presenting online and blended courses that respond to the culturally-diverse backgrounds of all students. Future research should be directed at identifying collaborative and facilitative online instructional strategies that foster a sense of community and increase academic achievement among culturally diverse students. If we can determine how to increase sense of community among minority students in predominately White online learning environments, perhaps we can concentrate on forming strong classroom communities and rely on these communities to promote high achievement among all students.

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August – 2004

## ***The Relationship between Self-Regulation and Online Learning in a Blended Learning Context***

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### **Abstract**

This study reviewed the distance education and self-regulation literatures to identify learner self-regulation skills predictive of academic success in a blended education context. Five self-regulatory attributes were judged likely to be predictive of academic performance: intrinsic goal orientation, self-efficacy for learning and performance, time and study environment management, help seeking, and Internet self-efficacy. Verbal ability was used as a control measure. Performance was operationalized as final course grades. Data were collected from 94 students in a blended undergraduate marketing course at a west coast American research university (tier one). Regression analysis revealed that verbal ability and self-efficacy related significantly to performance, together explaining 12 percent of the variance in course grades. Self-efficacy for learning and performance alone accounted for 7 percent of the variance.

**Keywords:** self-regulated learning; blended learning; online learning

The advent of the personal computer and the Internet in the 1970s, and their subsequent refinement and global diffusion, have occasioned a revolution in education generally and in distance education specifically (Bandura, 1997). Within the industrialized world, online education, either singly or as part of blended (part online, part face-to-face) education models, has become increasingly extensive in a wide array of learning domains (Bates, 2000, 1995; Edelson and Pittman, 2001; Kearsley, 2000). The dramatic growth of online education is demonstrated by recent reports from the National Center for Education Statistics (Sikora and Carroll, 2002) and the Council for Higher Education Accreditation (2002).

Bates (2000) characterized distance education as a continuum ranging from mixed face-to-face and distance teaching/ learning on one end to complete distance teaching/ learning on the other end. Distributed education represents an eclectic blend of technologies and modalities to enable both synchronous (real time) and asynchronous (anytime) teacher-learner and learner-learner interactions in a single course or program. Blended education is a form of distributed education, utilizing both distance and face-to-face modalities to deliver instruction. This paper is intended as a contribution to investigating the role of learner self-regulation in a blended learning context.

This review will first discuss social cognitive self-regulation theory as the theoretical framework underpinning the research. It will then describe within that framework five self-regulatory attributes identified in the distance education literature as important elements of distance learner success.

## **Theoretical Framework**

Much distance education research has been atheoretical. It has focused on three general areas: descriptive studies of distance education programs, group academic outcomes comparison studies (distance class versus face-to-face class), and studies matching individual learner traits with media variables (Perraton, 2000, 1995; Saba, 2000). These approaches, while necessary and valuable in their own right, have generally lacked a pedagogically relevant theoretical underpinning and have not generated advances in teaching/ learning theory that have served to benefit both distance teachers and learners (Diaz, 2000; Phipps and Merisotis, 1999).

Moore (1993) developed transactional distance theory as a descriptive framework for understanding distance education programs. Moore's theory consists of three primary descriptive variables: interaction (dialogue), structure, and autonomy. He contended that these three interrelated variables are characteristic of all distance programs. While interaction and structure concern primarily how a distance course is designed and conducted, and hence "belong" to the course designers and instructors, the third variable, autonomy, is centered on distance learners themselves and their ability to control their own learning.

Numerous distance education researchers have identified learner autonomy as an important factor in academic success (Holmberg, 1995; Jung, 2001; Kearsley, 2000; Keegan, 1996; Peters, 1998). Merely knowing the importance of this factor in distance learning, however, does not help in understanding precisely how autonomous distance learners function, how they exercise their autonomy effectively, or what specific factors are involved in successful autonomous distance learning.

The social cognitive perspective of self-regulation provides a framework for online education research that can offer insights into the functioning of autonomous learners. Working within this perspective, Zimmerman (1989) defined academic self-regulation as the extent to which learners are meta-cognitively, motivationally, and behaviorally active in achieving their learning goals. Self-regulated learners set task-specific learning goals and employ appropriate strategies to attain those goals. They monitor and evaluate their progress and adjust their learning strategies as necessary. They motivate themselves and focus on learning in the face of distractions. They seek assistance as necessary and ensure that their learning environment is conducive to learning. In short, self-regulated learners are active, adaptive constructors of meaning who control important aspects of their cognition, behavior, and environment in attaining their learning goals (Pintrich, 2000).

Zimmerman (1998, 1994) argued that a learner's personal choice and control are a defining condition for self-regulation. This emphasis on personal choice and control, important elements of learner autonomy, is important for distance learners (Doherty, 1998). Zimmerman (2002) pointed out that self-regulation is also important because it addresses a major educational goal, i.e., it enables the development of lifelong learning skills. The advent of online education has provided a context ideally suited to this pursuit of on-going education.

## **Self-Regulatory Attributes Predictive of Distance Learner Success**

Based upon a review of the literature, five self-regulatory attributes were selected as being especially important for distance learner success: motivation (self-efficacy and goal orientation), Internet self-efficacy, time management, study environment management, and learning assistance management (see Table 1). Each of these self-regulatory attributes and related psychological processes is discussed below.

### ***Motivation***

Motivation for learning focuses on why learners choose to learn (Pintrich and Schunk, 1996), and is a dimension of distance learner autonomy frequently cited in the distance education literature (Bates, 1995; Holmberg, 1995; Kearsley, 2000; Keegan, 1996; Moore, 1998; Olgren, 1998; Schrum and Hong, 2002). Simply knowing that motivation is an important variable in successful distance learner autonomy, however, is not particularly helpful. It is necessary to isolate specific components of motivation that can contribute to learner autonomy. Two important components of motivation are beliefs about one's personal efficacy (ability) for mastering a specific task and the personal goal orientation one brings to a course of study.

Personal perceptions of self-efficacy are a critical element of motivation (Bandura, 1997; Pintrich and Schunk, 1996). Bandura (1997) defined self-efficacy as individuals' judgments of their abilities to plan and carry out the necessary behaviors to achieve specific goals. Linnenbrink and Pintrich (2002) pointed out that adaptive self-efficacy beliefs can function as enablers of academic success. Learners with high self-efficacy are likely to employ adaptive self-regulatory learning strategies and study skills. Learner perceptions of personal efficacy, therefore, have a reciprocal relationship with the self-regulatory processes that affect motivation and performance. A high sense of self-regulatory efficacy enhances task performance efficacy, which in turn motivates further self-regulation in pursuit of further academic attainment.

Self-efficacy has been noted as important in successful distance learning (Gibson, 1998). A study of online learners by Wang and Newlin (2002a, 2002b) found that self-efficacy for course content as well as self-efficacy for technology skills were predictive of learner performance in the class. A study by Joo, Bong, and Choi (2000) indicated that self-efficacy for self-regulated learning related significantly though indirectly (through more specific self-efficacy variables) to student performance. A study by Zhang, Li, Duan, and Wu (2001) found that self-efficacy was positively related to students' goal orientation and self-regulatory learning skills.

A second component of motivation is a learner's personal goal orientation. Pintrich, Smith, Garcia, and McKeachie (1991) defined goal orientation as a learner's general goals or orientation toward a course. Intrinsic goal orientation is defined as the degree to which a learner participates in a learning task in order to meet a personal challenge, satisfy personal curiosity, and/or attain personal mastery over the elements of the task. Task performance, therefore, is an end in itself and not a means to an end. Intrinsic goal orientation contrasts with extrinsic goal orientation in that the latter signifies participation in a task as a means to an end (such as grades or rewards) and not as an end in itself.

Beatty-Guenter (2001), in reviewing the literature on course completion rates for distance students in Canadian community colleges, identified goal orientation as a significant attribute of those learners who completed their courses. Thompson (1998) noted that the fact that distance

learners set clear goals is an important element of performance. Gibson (1998) suggested that it is important for distance learners to be able to assume control over their learning goals, methods, and evaluation strategies. Several research studies have found that goal setting by distance learners contributes to performance (Curry, Haderlie, and Ku, 1999; Schrum and Hong, 2002; Whipp and Chiarelli, 2001). Learners who are goal oriented (either intrinsically or extrinsically) are more likely to set specific learning goals than learners with poor goal orientation. Those learners with an intrinsic goal orientation, however, are more likely to set mastery oriented goals.

Motivation, then, is a key element of autonomous learning. One component of motivation is self-efficacy – i.e., learners’ judgments about their ability to accomplish a task, as well as their confidence that they possess the skills to perform the task. Another component is a learner’s goal orientation, either intrinsic or extrinsic. It is important to note that there are other components of motivation not so prominent in the distance education literature – e.g., the value learners ascribe to specific learning tasks (how important, interesting, or useful they are to the learner), control of learning beliefs (the learner’s belief that success in performing a task is determined by his or her own efforts and not by an external agent), and affective factors (e.g., test anxiety).

### ***Internet Self-Efficacy***

Experience with technology is another important element of success for online learners (Schrum and Hong, 2002). Wang and Newlin (2002a, 2002b) found that both self-efficacy for learning course content, as well as self-efficacy for technology skills, were predictive of learner performance. Joo, Bong, and Choi (2000) found that Internet self-efficacy was an important variable in online learner success. Developing positive beliefs (self-efficacy) about one’s ability to work effectively with Internet technology is in part a result of successful experience using that technology. Ensuring that online learners are both comfortable and competent with using the technological tools central to their study experience is an important consideration in online learning.

### ***Time Management***

A third important element of distance learner success is the ability to effectively manage learning time (Kearsley, 2000; Phipps and Merisotis, 1999). Palloff and Pratt (1999) pointed out that interacting in a Web-based course can require two to three times the amount of time investment than in a face-to-face course. Roblyer (1999) noted that students who have difficulty managing time are more likely to achieve less in a distance course or drop out altogether. Gibson (1998) pointed out that a key construct relating to distance learners’ persistence is their self-efficacy for learning at a distance and that personal perceptions of competence (self-efficacy) are related to learners’ perceptions of their ability to manage time effectively.

Students who use their time efficiently are more likely to learn and/or perform better than students who do not have good time management skills. Self-regulated learners know how to manage their time because they are aware of deadlines and how long it will take to complete each assignment. They prioritize learning tasks, evaluating more difficult from easier tasks in terms of the time required to complete them. They are aware of the need to evaluate how their study time is spent and to reprioritize as necessary (Zimmerman and Risemberg, 1997).

## ***Study Environment Management***

Self-regulated learners are proactive in managing not only their study time, but also their study environment (Zimmerman and Martinez-Pons, 1986). They are sensitive to their environment and resourceful in altering or changing it as necessary. Since they do not study in a structured and controlled classroom context, online learners must be able to structure their own physical learning environment, whether at home or elsewhere. Whipp and Chiarelli (2001) found that social environmental structuring strategies were important attributes of successful online learners.

In terms of physical space, online learners generally have the option of accessing their courses via computers at home or elsewhere (e.g., library or computer lab). If they are working at home, they have the option of where the computer is situated – a quiet place such as a den or bedroom, or a louder more distracting environment, such as a living room or kitchen. If learners are unable to restructure their learning environment at home, they can access their course from a university or library computer. Learners must also ensure that they have access to and are proficient at using the equipment they require in order to study effectively – e.g., a computer of sufficient RAM and with the necessary software to access course materials, whether text, video, and/ or graphic. Mastery of these elements contributes to the learner's control over the virtual space within which online learning occurs.

## ***Learning Assistance Management (Help Seeking)***

Self-regulated learners also are aware of the important role other people can play in their learning. One of their distinguishing characteristics is their ability to seek academic assistance in an adaptive manner to optimize learning. Several authors have noted the importance of help seeking behavior in distance learning (Hara and Kling, 2000; Holmberg, 1995; Wang and Newlin, 2002a, 2002b). Autonomous distance learners are able to seek appropriate learning help from others. Since an element of online education is social isolation from classmates and instructors, online learners need to be proactive in employing the technology, through email, chat rooms, bulletin boards, as well as occasional face-to-face meetings, to lessen the social distance involved in their learning situation. Henderson and Cunningham (1994) argued that effective use of instructional technology systems requires that the learner be sufficiently motivated and self-regulated to effectively and efficiently utilize the features of the technology. In an online learning context, this means that learners either have or mindfully develop their skills in using the specific elements of the technology that permit interaction with other learners and with instructors. Online learners must be able to determine where and how to seek help, and make decisions concerning the most appropriate sources for such help.

## **Summary**

Learner autonomy (or independence) is a critical factor in successful online distance learning. Autonomy, however, is not a monolithic construct. As indicated above, it is comprised of a number of self-regulatory learning attributes that together contribute to learner autonomy in online learning contexts (see Table 1).

A critical component is motivation for learning. Two elements of motivation are efficacy beliefs and goal orientation. Efficacy beliefs reflect a learner's confidence to successfully accomplish a learning task. Goal orientation refers to the reasons why a learner engages in a learning task. A second component of online learner autonomy is experience with Internet technologies, which

contributes to the learner's confidence (self-efficacy) in effectively using the technology in order to learn. A third component of autonomy is the learner's ability to manage study time effectively and productively along with the other time demands in his or her life. A fourth component is the learner's ability to manage their study environment to ensure that it is supportive of learning and to restructure it as necessary. A fifth component of autonomy is the learner's ability to seek learning assistance as and when necessary and in the appropriate manner through the appropriate channels. This latter component involves knowing when help is needed, knowing where to seek that help, knowing how to request the help, and knowing how to evaluate the effectiveness of the help received (Aleven, Stahl, Schworm, Fischer, and Wallace, 2003).

These five components of learner autonomy are self-regulatory learning attributes that have been identified in the self-regulation literature as important factors in classroom-based learning. They have also been cited in the distance education literature as important elements of distance learning success. The purpose of this research was to investigate whether they are also significant predictors of academic success in a blended (part face-to-face, part online) learning context.

It is important to note, however, that these are not the only variables that contribute to self-regulatory behavior, merely those that have been selected for investigation in this study based upon their prominence in the distance education literature. There are other self-regulatory attributes, both motivational and behavioral, that comprise self-regulated behavior. These include such components of motivation as the value learners assign to specific tasks, locus of control beliefs, and affective factors. They also include cognitive and meta-cognitive learning strategies such as rehearsal, organization, critical thinking, and elaboration, among others. Any of these self-regulatory attributes also may be potentially significant aspects of online learning success.

**Table 1.** Selected Self-Regulatory Attributes and Related Psychological Processes Comprising Online Learner Autonomy

<b>Self-Regulatory Attributes</b>	<b>Psychological Processes</b>
Motivation	Efficacy beliefs: confidence in ability and skills to successfully perform specific learning tasks Goal orientation: reasons why a learner engages in a learning task
Experience with Internet technology	Internet self-efficacy: confidence in using and/or learning the technologies employed in online education
Time management skills	The ability to manage and structure learning time effectively and productively
Study environment management skills	The ability to ensure that the study environment is conducive to learning and restructure it as necessary
Learning assistance management skills (help seeking)	The ability to know when help is needed, identify sources of help, obtain help, and evaluate the help received

## **Method**

### ***Participants***

The research participants ( $n = 94$ ) were students in a blended undergraduate marketing class at a west coast American research university (tier one). The course consisted of eight sections, three of which employed online learning. Students were free to select the section they wished to register in, blended or traditional.

The course was blended in the ratio 75 percent online to 25 percent face-to-face, the mix decided by the course professor. Other mixes are possible depending upon the needs of the programs employing them. The course consisted of weekly topic modules for which the lectures and assignments were posted on the class website, and which the students were expected to regularly access and complete. They would meet with lab instructors for a 45-minute session once every two weeks. Each online module consisted of four elements: introduction, focus topics (assisting the students to focus on key points in the module), tasks (assignments for that module), and reading guide (comprehension questions to assist students understand the main points in the online lecture and/ or in an assigned textbook chapter). The professor was online three days each week for two hours each day. Students could contact the professor online at those times and receive immediate feedback regarding any questions or problems that they might have been having with the course. Assessment consisted of four elements: two mid-term tests worth 44 percent of the final grade for which the material tested was taken from the online modules; class participation, 4 percent; a marketing simulation, 30 percent; a video group project, 22 percent.

The age range of the sample was 18-41 ( $m = 20.6$ ). The sample was split evenly between genders, 47 male and 47 female. The ethnicities represented were 46 (48.9%) Caucasian; 14 (14.9%) Asian; 10 (10.6%) Hispanic; 6 (6.4%) African American; and 18 (19.1%) of unknown ethnicity. Thirty-eight (40.5%) were sophomores, 39 (41.5%) were juniors, and 17 (18.1%) were seniors.

### ***Instrumentation***

The criterion variable was the students' online academic performance, operationalized as their final grades scaled as percentages. Six predictor variables were selected from the literature review based upon their hypothesized importance for performance in online blended learning. Five were self-regulatory variables: intrinsic goal orientation, self-efficacy for learning and performance, time and study environment management, help seeking, and Internet self-efficacy. The first four variables were operationalized in the form of the relevant subscales on the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, and McKeachie, 1991).

The MSLQ was developed over a period of three years in the 1980s and early 1990s, during which it was validated through factor analyses, reliability analyses, and correlations with measures of achievement (Pintrich, Smith, Garcia, and McKeachie, 1991; see also, Pintrich, Smith, Garcia, and McKeachie, 1993; Winne and Perry, 2000). It contains 81 items in two sections, a motivation section and a learning strategies section. The motivation section contains 31 items in six subscales: intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performances, and test anxiety. The learning strategy section contains 50 items in nine subscales: rehearsal, elaboration, organization, critical thinking, meta-cognitive self-regulation, time and study environment management, effort regulation, peer learning, and help seeking. The MSLQ subscales selected for this study (with

their reported alpha reliability coefficients) were intrinsic goal orientation (.74), self-efficacy for learning and performance (.93), time and study environment management (.76), and help seeking (.52).

Internet self-efficacy was operationalized through the eight-item Internet Self-Efficacy Scale developed by Eastin and LaRose (2000). Construct validity of the scale was obtained by a confirmatory factor analysis. As social cognitive theory suggests, Internet self-efficacy correlated positively with Internet usage, prior Internet experience, and outcome expectancies. It correlated negatively, as expected, with Internet stress and self-disparagement. Also, Internet self-efficacy was unrelated to measures of general psychological well-being (Eastin and LaRose, 2000). The reported alpha reliability coefficient of this scale was .93.

Verbal aptitude, operationalized as the 50-item verbal IQ section of the Schubert General Ability Battery (1986), was included as a control variable because online education remains largely text-based. It was assumed that those learners with higher verbal IQ would tend to perform better in online education than those students with lower verbal IQ, regardless of the degree of their academic self-regulation. The Schubert General Ability Battery was validated through being correlated with four other mental ability tests administered to entering college students, with the word meaning section correlating in a range from .55 to .80. The General Ability Battery also was normed with a variety of sample populations and found to discriminate between groups that are expected to differ in the ability measured. The battery was normed at three academic levels, high school, college, and graduate school, and found to discriminate among those levels with the scores increasing as academic level rose. A test-retest reliability coefficient of .67 was reported for this subscale.

The survey instrument used in this study consisted of 82 items in four sections. Section one was eight demographic items adapted from the MSLQ. Section two was 24-items measuring four self-regulatory attributes: intrinsic goal orientation, self-efficacy for learning and performance, time and study environment management, and help seeking, also adapted from the MSLQ. Section three was the eight-item Eastin and LaRose Internet Self-Efficacy Scale. Section four was the 50-item word meaning section of the verbal IQ measure from the Schubert General Ability Battery.

## ***Procedure***

A non-experimental correlational research design using non-random sampling was employed to explore the predictive value of the six independent variables in terms of the criterion variable (final grades).

The research questionnaire was distributed to students in the blended sections of an undergraduate marketing class at an American west coast university over two offerings of the course, Spring and Fall, 2002. Students took the questionnaires home to complete, and those wishing to participate in the research returned the completed questionnaires during the next on-campus session. Of a total of 352 questionnaires distributed, 94 useable questionnaires were returned, representing an overall return rate of 26 percent.

## **Results**

The study employed both descriptive and inferential statistics. The descriptive analysis included an overview of the demographics of the sample and means, standard deviations, and simple



correlations of the variables investigated in the study, as well as reliability analysis of the subscales. The inferential analysis was a stepwise multiple regression run on SPSS Version 9.0. The level of significance used for the analyses was .05.

Reliability analysis revealed that all subscales had good internal consistency reliabilities: intrinsic goal orientation (.71); self-efficacy for learning and performance (.92); time and study environment management (.80); help seeking (.67); Internet self-efficacy (.93); and verbal ability (.82).

Simple correlations of all the variables in the study (see Table 2) revealed that self-efficacy for learning and performance and verbal ability correlated significantly with final grades at  $r=.29$ ,  $p<.01$  and  $r=.26$ ,  $p<.05$  respectively.

**Table 2.** Pearson Product-Moment Correlations of the Variables. N = 94

	1	2	3	4	5	6	7
1. Intrinsic Goal Orientation	-	.467**	.314**	.118	.009	.072	.157
2. Self-Efficacy for Learning and Performance	.467**	-	.324**	.044	.128	.150	.291**
3. Time and Study Environment	.314**	.324**	-	.052	.012	-.045	.146
4. Help Seeking	.118	.044	.052	-	-.086	-.247*	-.102
5. Internet Self-Efficacy	.009	.128	.012	-.086	-	-.043	-.089
6. Verbal Ability	.072	.150	-.045	-.247*	.043	-	.264*
7. Final Grades	.157	.291**	.146	-.102	-.089	.264*	-

Note. \*Correlation is significant at the 0.05 level (2-tailed). \*\*Correlation is significant at the 0.01 level (2-tailed).

The significant correlation between intrinsic goal orientation and self-efficacy ( $r = .47$ ,  $p<.01$ ) reflected the relationship between them as attributes of motivation. The significant correlation of time and study environment management with intrinsic goal orientation ( $r = .31$ ,  $p<.01$ ) and self-efficacy ( $r = .32$ ,  $p<.01$ ) indicated the relationship between learner motivation and the behavioral strategies involved in learner control of study time and study environment. The small negative correlations of help seeking and Internet self-efficacy with final grades indicated that as grades increased help seeking and Internet self-efficacy decreased marginally.

The partial regression coefficients (b) in the model for the significant predictors were 1.74 (self-efficacy) and .236 (verbal ability). The standardized regression coefficients (Beta) in the model were .257 (self-efficacy) and .225 (verbal ability). Approximately the same relationship held between verbal ability and final grades.

A stepwise multiple regression analysis revealed that only self-efficacy for learning and performance, and verbal ability made significant contributions to predicting the variance in final grades (R Square value = .134; Adjusted R Square value = .115;  $F_{2,91} = 7.06$ ,  $p < 0.05$ ). The regression model with two predictors (self-efficacy and verbal ability) was significantly related to

the criterion variable (final grades),  $F_{2,91} = 7.058$ ,  $p < .01$ . Adding the second predictor (verbal ability) to the regression model rendered a significant R square change of .05,  $F_{2,91} = 5.215$ ,  $p < .025$ . Self-efficacy and verbal ability together accounted for about 12 percent of the variance in final grades. None of the other predictor variables made significant contributions to the regression model.

The semi-partial correlations for each of the significant predictor variables were self-efficacy,  $r(91) = .254$ ,  $p < .011$  and verbal ability,  $r(91) = .223$ ,  $p < .025$ . The semi-partial correlation for self-efficacy squared gives a value of .07, indicating that self-efficacy accounted for 7 percent of the variance in final grades, with verbal ability held constant. The semi-partial correlation for verbal ability squared rendered a value of .05, indicating that verbal ability accounted for 5 percent of the variance in final grades with self-efficacy held constant. Together, therefore, self-efficacy and verbal ability accounted for about 12 percent of the variance in final grades. The other self-regulatory variables did not contribute significantly to the regression equation.

## Discussion

The sample studied was likely one in which self-regulation was not problematic. Since it was comprised of students at a tier-one research university with rigorous selection procedures, the sample likely was relatively highly self-regulated. How the course modules were presented online also probably influenced the results. Embedded within each module was a number of self-regulation enhancing elements, including focus topics and a reading guide.

The significant and positive relationship between verbal ability and performance (final grades) was not surprising. It was assumed that verbal ability, as a measure of intelligence, would have a significant and positive relationship with performance generally, given the heavily text-based nature of the course.

Self-efficacy has been demonstrated to be an important aspect of performance in classroom-based learning (Pintrich and Schunk, 1996). The significant correlation between self-efficacy and final grades in this study supported findings by Wang and Newlin (2002a, 2002b), Joo, Bong, and Choi (2000), and Zhang, Li, Duan, and Wu (2001) that there is a significant and positive relationship, either direct or indirect, between self-efficacy and performance in online education. Given the importance of learner motivation indicated in the distance education literature (Bates, 1995; Holmberg, 1995; Kearsley, 2000; Moore, 1998; Olgren, 1998), and the role played by self-efficacy as a critical component of motivation, a closer scrutiny of online learner self-efficacy perceptions by course designers and instructors therefore seems appropriate. Self-efficacy perceptions should be assessed pre-course in order to identify learners potentially at risk of course dropout or low performance. Efficacy enhancing activities and feedback should then be designed into the course as a means of assisting these students to successfully complete the course.

The blended nature of the course also likely contributed to the research findings. The sample studied was part of a blended class and this may explain why help seeking was not a significant predictor of final grades, since the students were receiving regular input from the class professor and lab instructors as well as other students during the on-campus meetings.

The blended nature of the class may also explain why time and study environment management and Internet self-efficacy were not significant predictors of performance. Regular on-campus meetings would lessen the need for individual time and study environment management since much of that management was built into the course, thus increasing its structured nature and

reducing both the importance of and the scope for learner autonomy. As course structure and interaction between students and instructor increase, the importance of learner autonomy decreases (Moore, 1993; Moore and Kearsley, 1996).

The lack of a significant relationship between Internet self-efficacy and academic performance may be partly explained by the blended nature of the class. Students were not entirely dependent upon the Internet, as they would have been in a purely online distance course, thus lessening the importance of individual autonomy in this variable as well. Also, the nature of the sample may have been such that Internet proficiency was high.

In summary, this research found that of the self-regulatory learning variables selected for investigation, intrinsic goal orientation, Internet self-efficacy, help seeking, and time and study environment management were not significant predictors of performance in the sample studied. The study did find a significant and positive correlation between self-efficacy and course grades and also between verbal ability and course grades. Correlation, of course, does not prove causality. It can, however, indicate that a pattern of influence between two variables may exist – i.e., in this case, that self-efficacy and verbal ability may both be significant predictors of performance in online blended learning contexts. Further research is required to test this relationship.

In terms of verbal ability, course designers and instructors should be aware that online text-based presentations demand as much verbal intelligence as course readings in equivalent classroom-based courses. This of course raises issues of online course design and course entry criteria for students. Depending upon the target clientele, text material may be “written down” to a lower grade level, or greater reliance may be placed upon video and/ or graphic presentations. However, given that universities offering pure online and/or blended courses are likely to wish to maintain (or be required to maintain) equivalent content and grading standards for both classroom-based and online offerings, student selection criteria therefore must also be equivalent for both course types.

In terms of the relationship found in this study between self-efficacy and performance, course designers, administrators, and instructors should be aware that learners with low self-efficacy perceptions will likely be less autonomous and will therefore have greater difficulty completing the course successfully than those learners with high self-efficacy perceptions. It is important, therefore, to identify such at-risk students prior to the beginning of a course in order to either direct them to a face-to-face course where less learner autonomy is required or to implement efficacy enhancing activities and feedback in the online course.

There are several suggestions for further research. First, research should be conducted employing a sample from a less homogeneous population than that employed in this study. Community college students studying online are likely to exhibit greater individual variability in terms of their self-regulatory skills. Secondly, although age and gender were not part of the research design for this study (they were included in the demographic section simply to provide a richer profile of the sample), such individual difference variables should be investigated in future research into the relationship between self-regulation and online learning generally. A third area meriting further research is investigation of the predictive value of those components of motivation (e.g., extrinsic motivation, value beliefs, control of learning beliefs, affective factors) and learning strategies (e.g., critical thinking, elaboration, meta-cognitive self-regulation, effort regulation) not included in this study. A fourth research area worth pursuing concerns identifying precisely which efficacy enhancing interventions are most effective in an online context.

Finally, there is also a need to investigate whether there are significant differences in the self-regulatory attributes that contribute to performance in different types of online education – e.g., blended versus purely online courses, more highly structured versus less highly structured courses, and the various blended course models now being designed and implemented in higher education. Research is required to investigate the unique characteristics of various blended learning models employing different blends of technologies, as well as different blends of face-to-face and online delivery of instruction, and how those varied characteristics affect learner performance.

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## ***A Peek into the Life of Online Learning Discussion Forums: Implications for Web-based distance learning***

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### **Abstract**

Supporting quality learning in online discussion forums is an intricate task, particularly for e-tutors aspiring to facilitate vigorous interactive learning environments. I argue that the key to successful online discussion forums is the ability of e-tutors to provide learners with feedback well informed in the meaning making and knowledge advancement processes emanating from learner interactions. In this paper, a newly developed concept of providing e-tutors with the information they require is explored, exhibiting the Event Centre (EC) concept, through which tutors are able to obtain periodic “snapshots” of the occurrences throughout discussion forums, which highlight processes of meaning construction and knowledge advancement. The EC concept provides e-tutors with visual images that depict the links and routes through which participants using text messages convey meaning, construct knowledge, and create Socio-Informational networks within discussion forums.

**Keywords:** e-learning; online discussion forums; e- tutoring; visualising social networks; monitoring online learning; online constructivist learning

### **Introduction**

The technology applied by Online Discussion Forums accommodate the potential for e-tutors and e-learners to engage in continuing tutorials, rich in dialogues and reflections, and generate processes of meaning construction and knowledge advancement. Accomplishing the full potential entailed in the technology requires feedback support that is well informed in meaning construction and knowledge advancement processes, that in turn support students’ understanding and knowledge construction (Rowntree, 1997).

In my role as a “participant observer” in an online tertiary course, I realised that reading and responding to students’ messages on a message-by-message basis had its merits, particularly in encouraging interactions and social negotiations of ideas and meaning making (Jonassen, Davidson, Collins, Campbell, and Bannan Haag, 1995). At times, however, I felt that this sporadic manner of response to students was lacking the overview needed to support ongoing processes through which knowledge is developed and advanced over a period of time. As an e-tutor, I needed prompt access to the process as a whole, so as to identify significant turning points or defining moments in the meaning making processes. The more intensive the interactions in the discussion forum became, the more I felt the need for a tool that would enable more than merely sporadic, message-by-message feedback to support students.

In this paper, I argue that for e-tutors to be able to provide learners with relevant, well informed feedback, there needs to be a mechanism that would enable:

- Periodic processing and analysis of large amounts of information generated by the interactions occurring throughout Online Learning Discussion Forums (OLDF)
- Periodic and easily obtainable “snapshots” of the interactions underpinning the generation of content through which e-tutors will be able to detect significant points in the discussion, highlight meaning and knowledge construction instances, and for providing relevant feedback

The two issues raised here reveal the complexity of the information needed, as they imply the analysis of large quantities of information, while maintaining close investigation of the content conveyed, mindful of key instances in the processes of meaning and knowledge construction.

I will begin this paper by addressing issues related to using online discussion forums as interactive learning environments; I will then review existing approaches for analysing Online Learning Discussion Forums (OLDF); and proceed to describe the development of a new concept presented in this paper, called the Event Centre (EC) concept, which attempts to provide e-tutors with an accessible tool of analysis based on visualisations of the occurrences in discussions forums, and significant instances of the meaning construction process which emerge throughout the discussion. In the final section, I outline the potential entailed in the EC concept for providing relevant feedback, thereby supporting meaning making and knowledge construction (albeit, not exhibiting the processes themselves, as this would be beyond the scope of this paper).

## **Internet as an Interactive Learning Environment: A paradigm shift for e-Learning**

Online learning discussion forums are predominantly embedded in e-learning, which is primarily a form of technology-mediated learning used for the benefit of distance learners. Historically, distance education has always relied on technology for reaching learners. Earlier forms of technology used for distance learning – i.e., television – lacked the central essence of quality teaching, specifically the ability to interact with the learners. The necessity to provide interactivity turned the attention to computer-based learning (Rosenberg, 2001). Computer-based learning provided Human-machine interactivity; however, it failed to provide human feedback so important for successful learning (Laurillard, 1993).

Apart from the inability to cater for human feedback, all earlier used learning technologies were primarily based on “the sage in the box” model. This predominant model of teaching and learning in technology-mediated learning was based on that of the “traditional classroom” concept, wherein the teacher or an alternative source of authority, transmitted a fixed body of knowledge to students. This traditional approach has been contested by constructivist principles, where learners are encouraged to take an active part in the learning process and construct their knowledge by interacting with learning materials and their peers (Sherry, 1996). Distance learning was able to embrace constructivist principles with the arrival of computer networks, allowing people to interact with other people for mutually constructing knowledge. For distance learning, particularly in tertiary education, the arrival of computer networks introduced the potential for a paradigm shift in the perception of teaching and learning (Kanuka and Anderson, 1999).

## **Online Learning Discussion Forums as Social Interactive Learning Environments**

Jonassen and colleagues (1995) believe that the computer networks infrastructure running online discussion forums, enable the application of constructivist learning theories, which emphasis the importance of social interactions for the construction of knowledge. Constructivist principles provide a set of guidelines for creating learner-centred, collaborative environments that support reflective and experiential processes. Within the constructivist approach, learners and teachers are urged to construct meaning, understanding, and relevant practice together through social interactions (Jonassen et al., 1995). This approach is associated with the Vygotskian view that learners co-construct meanings actively and continuously in a social context (Young, 1997, p.107). For Vygotsky (1978) shared meaning is created especially in the Zone of Proximal Development (ZPD), which he defines as: “the difference between the development of the individual’s performance in ‘independent problem solving,’ and in ‘problem solving under adult guidance’ or in collaboration with more capable peers” (Vygotsky, 1978, p. 86).

Tharp and Gallimore (1991) argue that teaching occurs when assistance is offered at points in the ZPD at which performance requires assistance. They propose that there are three major mechanisms for assisting learners through the ZPD: modelling, contingency management, and feedback (Tharp and Gillmore, 1991 as cited by Bliss, Askew, and Macrea, 1996). In this paper, I will focus on the third mechanism – feedback.

### **The Importance of Human Feedback and “Customised Learning Assistance”**

A survey conducted by McCollum et al., (McCollum, Calder, Ashby, and Morgan, 1995) showed that students ranked feedback, or assistance in learning, as the highest factor in determining course quality. Rowntree (1997) describes feedback as “the key to quality in education and training” (p. 58), and suggests that “feedback is what enables us *all* to learn from our experience . . . What learners need is something *personal* – a response from another human being that challenges or confirms their understanding and helps them overcome errors or encourage them towards new insights” (Rowntree, 1997, p. 58).

Laurillard (1993), in her analysis of university teaching, emphasises the importance of feedback provided through dialogic interactions, wherein tutors can provide intrinsic and adaptive feedback. Laurillard suggests that: “No simulation or technology is able to give truly intrinsic or fully customised feedback, the closest they can manage is ‘extrinsic feedback.’” Online tests self-assessment questions and other artificial sources of formative feedback cannot provide the degree of depth or insight required for customised learning assistance . . . in the ways a human tutor can” (Laurillard, 1993, p. 153). The emphasis Laurillard puts on human dialogue and feedback highlights the importance of giving e-tutors the necessary tools for providing what she refers to as “customised learning assistance.”

Customisation of the learning process provides an opportunity for students to have course materials interpreted in ways meaningful to them. This is why tutors need to be aware of students’ conceptual processes and difficulties (Ramsden, 1988). Providing tutors the tools necessary for obtaining this information is crucial for the customisation of the learning and the provision of relevant feedback.

The literature acknowledges the importance of feedback for learning, and implies that e-tutors involved in implementing constructivist learning approaches in online environments would benefit from having analysis tools to help them identify significant instances of meaning construction, so as to better support these processes. In the search for such analysis tools, the following section summarises existing research done in the realm of online discussion forums.

## **Existing Approaches to Studying Online Learning Discussion Forums**

Prevalent research approaches studying Online Learning Discussion Forums (OLDF), encompass a wide variety of research methodologies applied across a wide array of research perspectives, ranging from quantitative measurements of “log-in frequencies” (Monroe, 2003), to descriptive “quantitative content analysis” that measures the frequency of contributions per student (Bullen, 1998; Weis and Morrison, 1998, as cited by Rourke and Anderson, 2004), through to inferring from quantitative content analysis for assessing learning processes in online contexts (Kanuka and Anderson, 1998), or alternatively applying “qualitative content analysis” techniques for studying the quality of the messages as artifacts of critical thinking and argumentation content (Jeong, 2003).

Quantitative and qualitative content analysis techniques provide valuable information about learning processes; however, Rourke, Anderson, Garrison, and Archer (2001) argue that content analysis techniques present researchers with a number of difficulties, some of which are of pragmatic nature, as content analysis is a time consuming technique, particularly as described in the scenario portrayed by Rourke and Anderson (2004). Other difficulties are of a methodological nature, for example objectivity, reliability, replicability (Rourke et al., 2001).

Although OLDF could predominantly be described as social constructivist learning environments (Ferdig, Roehler, and Pearson, 2002), most studies conducted within the realm do not seem to attribute much attention to the interactions and the social dynamic processes occurring in OLDF, and the meaning making and knowledge advancement these portray (Collins and Berge, 2001; Jeong, 2003), although Levin, Haesun and Riel (1990) attempted to study interactions by developing an approach they called “Inter-Message Reference Analysis,” where messages were analysed by coders who determined whether a message was referring to a previous message. These researchers, however, admit that this method proved ambiguous in some cases (Wang, 2000).

Adopting the “login” quantitative approach would grant e-tutors reasonable access to periodic updates concerning students’ login behaviour patterns. Information obtained through this approach, however, is stripped of the content conveyed by participants. On the other hand, content analysis techniques, both quantitative and qualitative, are not readily inclined to periodic updates, as the processing of text messages is time consuming, and at times not generalisable even within a specific OLDF.

Furthermore, neither “login” nor “content analysis” techniques provide a descriptive, analytic framework that would enable studying online interaction and the affect these may bear on learning, just by looking at the data, without having to make any inferences (Rourke and Anderson, 2004).

As such, I argue that the approaches presented in the available research are not well-equipped for the analysis requirements needed for supporting constructivist learning and providing learners with informed feedback.

## **Developing a New Concept for Studying OLDF: The Event Centre (EC) concept**

The idea underlying the Event Centre – herein called the EC concept – simply suggests that people participating in online discussion forums, or more specifically, discussion threads, are in fact taking part in various conversational events, which linked together comprise a discussion thread. Each of these conversational events may involve constant or varying groups of participants.

In attempting to study the evolution of discussion threads, their content and participants' activities, I chose to break down the process into three stages:

*First stage* – “who talked to whom?”

*Second stage* – “who talked to whom” and on “which occasion?”

*Third stage* – “who talked to whom,” on “which occasion,” and “about what?”

In the first stage, in attempting to discover “who talked to whom,” I applied Web usage mining, which allowed me to discover and analyse useful information from the Web-data, and use it for trailing users' behaviour on the Web (Wang, 2000), as well as discover patterns of usage (Srivastava, Cooley, Deshpande, and Tan, 2000). The e-learning system running the discussion forums comprising my data-set is based on an SQL server, which automatically generates a triple coding for every message posted to forums:

1. *Thread Key* – identifying the discussion thread to which the message belongs
2. *Parent Key* – indicating the affiliation of the message to another message in the thread. The “Parent” key code affiliates originating messages with their associated responding messages. A responding message will adopt the post key of the originating message as its “Parent” key, positioning itself as the “child” of the parenting message.
3. *Post key* – is the specific identification number assigned to each post

By manually extracting the server's generated key codes, I created Table 1, which lists in the left column the names of participants coupled with the “Thread” and “Post” keys. Combining the participant with the message coding enabled me to associate a participant with a specific message. The right column of Table 1 lists the “Thread” key coupled with “Parent” key of the messages sent by the participant showing on the left.

**Table 1.** Participants and “Message Affiliation”

Participant Key Codes	Message Affiliation Key Codes
Mary-100-100	100-0
Bob-100-344	100-100
John-100-542	100-100
Dianne-100-678	100-344

Table 1 contains the information needed for discovering “who posted,” “which message,” as well as “in response to whom.” The manner in which the information is represented, however, is not very clear, and is quite inaccessible when trying to analyse whole discussion threads, which are much longer than the small sample shown in Table 1.

I converted Table 1 into a binary matrix, (Table 2). The zeros (0) in the matrix indicate no entries; the ones (1) indicate entries. The matrix format is better suited for visually depicting who responded to whom, by simply following columns containing more than one entry.

**Table 2.** Participants Posting Messages

Participant/ message	100-0	100-100	100-344
Mary – 100-100	1	0	0
Bob – 100-344	0	1	0
John – 100-542	0	1	0
Dianne – 100-678	0	0	1

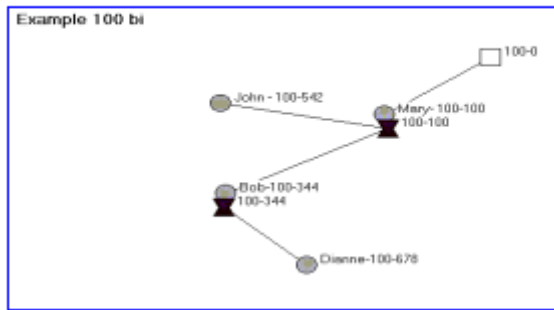
Table 2 shows that Bob and John responded to the same parenting messages marked 100. Identifying the original or “Parent” message and its responses was possible by following the second part of the key codes, which are highlighted in bold fonts in Table 3. Identical second parts of the code meant people were responding to the same message, creating a conversational event where participants responded to an originating message.

**Table 3.** Event Centres Formation

Participant / Response	100-0	100- <b>100</b>	100- <b>344</b>
Mary – 100- <b>100</b>	1	0	0
Bob – 100- <b>344</b>	0	1	0
John – 100-542	0	1	0
Dianne – 100-678	0	0	1

To gain a clearer visualisation of the conversational events and their participants, I converted the matrix of Table 3 into a graph. Figure 1 marks participants in grey circles and conversational events in black shapes. The white square identifies the initial message at the start of the discussion.

**Figure 1.** Participants and Conversational Events

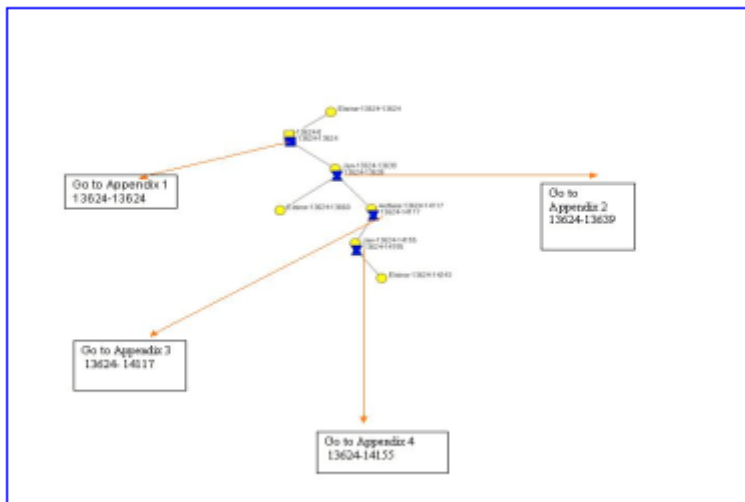


Identifying the conversation events completed the *Second Stage* relating to “who talked to whom” and “on which occasion.”

The concept emerging from this process perceives the activities in online discussion forums as interactions between people, communicating with other people in different conversational events, which I chose to name “Event Centres.” An Event Centre (EC) is formed when one or more participants respond to a message posted on the discussion thread. The various ECs, and the participants contributing to them, form networks of people connected by events.

Addressing the third stage, “*who talked to whom,*” “*on which occasion,*” and “*about what,*” the EC concept enables the visualisation of the participants of each EC with the relevant messages and responses associated with it. Figure 2 indicates the participants in each EC, by linking participants to the messages they contributed in the particular EC. (Full content of messages can be found in the referred appendices).

**Figure 2.** Socio-Informational Network



A Web-view of this concept is available on: <http://etalk.bravehost.com>. This Web-view demonstrates the EC concept, which I manually constructed myself. Further technological development needs to be done, however, for the EC to be accessible and ready for practical use by e-tutors or researches interested in processes occurring in online discussion forums.

## Research Population and Data Scope

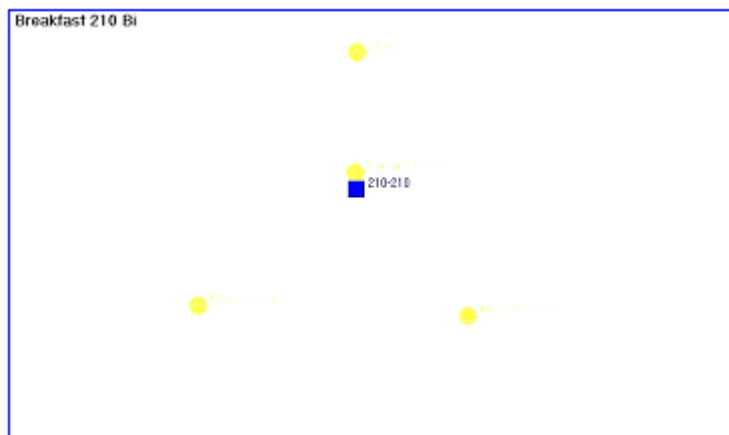
By archiving the messages generated by a group of 19 educators participating in a Master's level distance-learning course, I used the EC concept to analyse the data collected. The group I observed used the online discussion forums activated throughout the course for dialogue and reflection. The course lasted 10 months, during which 32 different discussion forums were activated, producing 299 discussion threads. For the purpose of this study, I chose to include the 131 threads showing three and above contributions, while ignoring the shorter threads.

## Applying the EC Concept for Data Analysis Findings

By processing the 131 threads, using the method described in Tables 2 and 3, and Figure 1, reoccurring patterns in the dynamics underpinning the emergence of Event Centres (EC) within my data, could be detected. In categorising the patterns that emerged, I focused on following the links spawned from one EC to the next. For visual clarity purposes, I discoloured the activities of the members in each EC, highlighting only the ones linking one EC to another.

Six observable categories of patterns emerged from my analysis. Two uninvolved colleagues and myself, carried out categorising each of the 131 threads, according to the six categories.

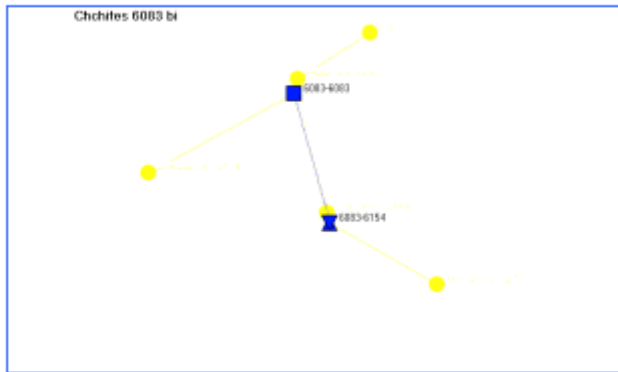
**Figure 3.** Category 1, The Uni-Focal or the “Star”



Category 1 reveals Uni-Focal dynamics, resulting in a single EC consisting of the initial EC (marked in a square shape). This pattern emerges when all participants respond to the initial EC, creating a star-like shape of all responses directed to one single point. This is why I chose to call this category the “Star.”

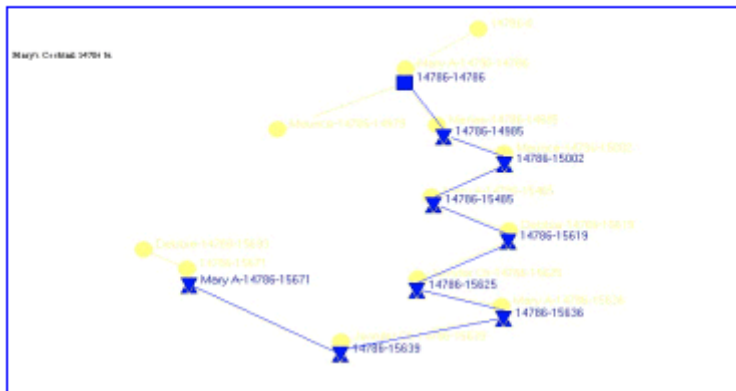


**Figure 4.** Category 2, “The Duo-Focal”



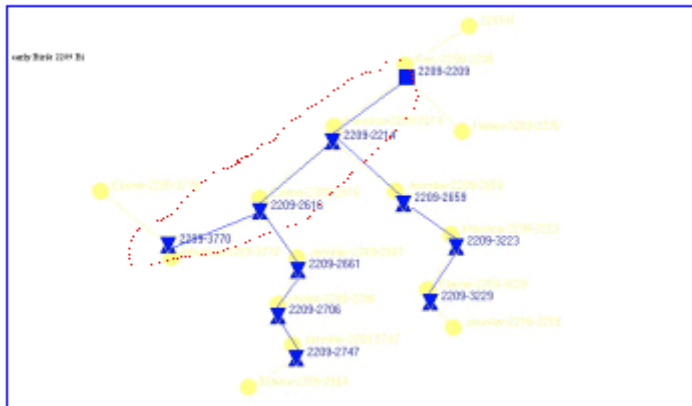
Category 2 reveals Duo-Focal dynamics, resulting in two EC; one is the initial EC (marked in a square shape), initiating the emergence of an additional EC. This pattern emerges when one or more participants engage in responding to a response made to the initial EC, so that a second EC emerges.

**Figure 5.** Category 3a, “The Chain”

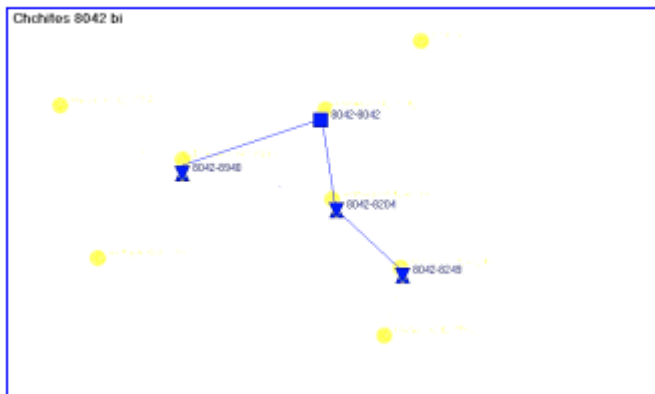


Category 3a, The Chain, reveals multiple EC linked in a chain like format, suggesting that the dynamics in this case were produced by respondents replying to a previous message.

**Figure 6.** Category 3b, “The Multi-Chain”



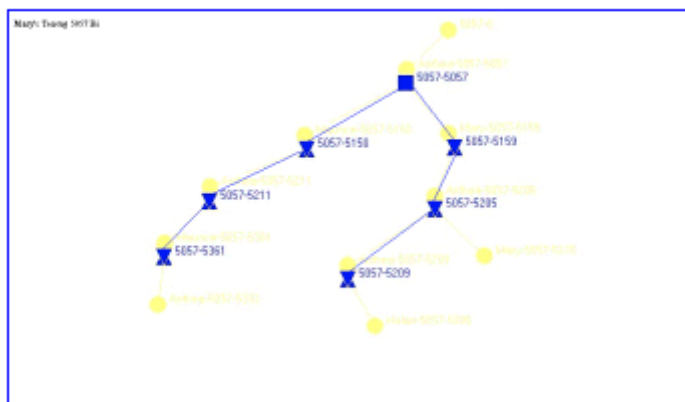
**Figure 7.** Category 4a, “The Branch”



In Category 3b, Multi-Chains emerged when responses triggered by various EC on the primary chain (inside the dotted area) emanating from the initial EC (marked as a square), evolved into multiple chains or threads of discussion.

In Category 4a, The Branch, the initial EC (marked as a square), generates two separate responses, which may provoke some continuum in either branches.

**Figure 8.** Category 4b, “The Branch and Chain”



Category 4b, The Branch and Chain, depicts chains evolving from each of the branches creating two or at times several chains.

The Multi Chain (3b) differs from The Branch and Chain (4b), in that in the 3b Multi Chain pattern, a primary discussion is emerging from the initial message, and this is the primary chain that spawns additional chains; whereas in The Branch and Chain (4b) pattern, two or more chains emanate directly from the initiating message. For the purpose of this paper, I defined chains as a sequence of three and above messages, excluding the initial message. At this point, this definition is arbitrary, and further investigation into this matter is needed.

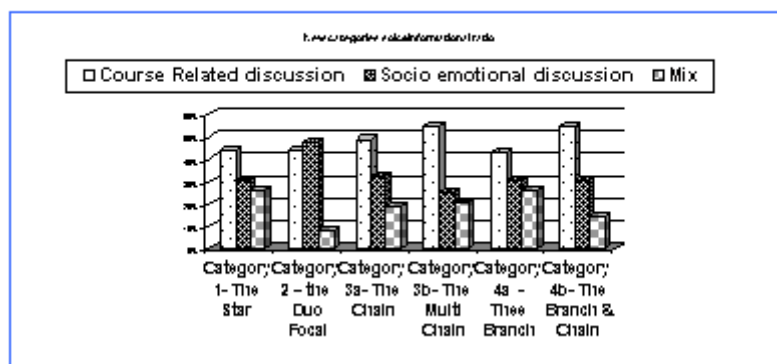
Studying the content of the messages posted in the discussion forums comprising my data set, using the EC as my unit of analysis, I was able to identify two key discussion topics:

1. *Course related discussions* – i.e., references to course readings or theories discussed in the course; tasks related activities; instructions and requirements related activities
2. *Socio emotional discussions* – i.e., expressing personal perspectives, personal experience, empathy; or posting personal messages; humour

Using “quantitative content analysis” techniques, I coded all the EC in my data set. I created a third category titled the “*mix*” for cases in which the content of the EC related to both categories of discussion topics.

The graph below shows the total number of messages coded in each of the coding categories:

**Figure 9.** Socio Informational Ratio



Categories 1, 2, 3a, and 4a, show an average of 45 percent course related discussions, while Categories 3b and 4b show an increase of 10 percent, with a soaring 55 percent of course related discussions.

## **Patterns as Information Conveying Structures**

The above findings indicated a relationship between patterns, and represent structures created by members’ actions and the amount of information flowing within them. This realisation pointed me in the direction of Social Network Analysis (SNA), which is an intellectual tool for the study of social structures generated by social action (Scott, 2000; Wellman and Berkowitz, 1988). Social Network Analysis maps social structures and describes their patterns using tools derived

from mathematical graph theory, thereby enabling the visualisation of structures as well as mathematical analysis of the social actions and relationships constructing them (Wellman and Berkowitz, 1988).

Pursuing the relation between structure and information flow, I chose to apply one of the mathematical tools used by SNA, the “Information Centrality” routine. “Information” in the context of “Information Centrality” routine refers to “the level of ability to transmit, to communicate”(Stephenson and Zelen, 1989). Stephenson and Zelen’s concept suggests that the more central a participant is in the network, the higher their ability to transmit or communicate. The individual’s centrality – or “Actor Information Centrality” as it is referred to in SNA literature – can be extended to “Group Information Centrality,” measuring the average “information,” (or the ability to communicate), across all the individuals in the network (Wasserman and Faust, 1994, p. 192-8)

By measuring Information Centrality across all 131 threads of my data, and categorising them in their appropriate category across the six various categories, I was able to measure the level of “information” in each category. Table 4 ranks each of the six the categories’ levels of information centrality in a descending order.

**Table 4** Category Levels of “Information Centrality”

Category	Level of Group Information Centrality
1. – The Star	9.1
4. – The Branch	0.81
3a. – The Chain	0.71
2. – The Duo-Focal	0.46
4b. – The Branch and Chain	0.36
3b. – The Multi Chain	0.16

Table 4 distinctly shows that Category 1, The Star, holds the highest levels of Information Centrality; while Category 3b, The Multi-Chain, and Category 4b, The Branch and Chain, are at the low end of the scale.

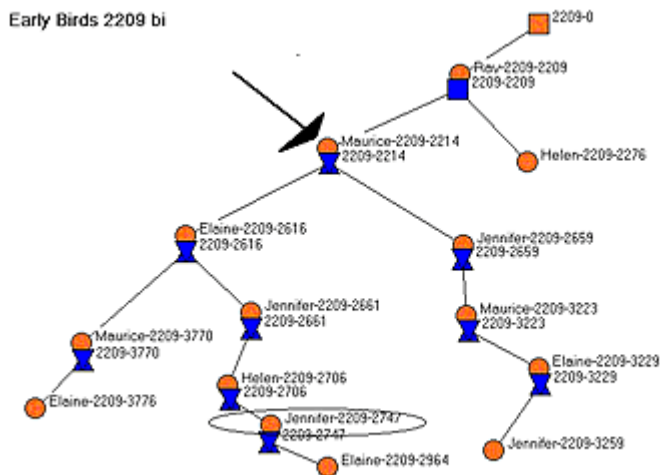
SNA’s Information Centrality measures distinctly rated Category 1, The Star, as the most efficient pattern for disseminating information, exhibiting a level of 9.1, which is far above all the other categories. High levels of dissemination do not necessarily ensure that all the information disseminated is course related. However, the Star pattern showing this measurement indicates the dynamics in which information is conveyed.

## **Dynamics of Information Flow in Discussion Forums**

By re-engaging SNA as a tool for the study of social structures generated by social action (Scott, 2000; Wellman and Berkowitz, 1988), I looked at what the patterns might tell me about the dynamics of information flow in different pattern categories. On one end of the spectrum, there was The Star pattern (Category 1), which illustrated centralised dynamics wherein all participants respond to a single message sent by a specific person, hence rendering that person a central position in the group, controlling all transfer of information. This type of dynamics grants the central participant high levels of power, control, and authority. At the other end of the spectrum, The Multi Chain (Category 3b) and The Branch and Chain (Category 4b) show decentralised

dynamics, where no single person can be identified as having more control or authority than the others (Ioannides, 2003). In The Multi-Chain and The Branch and Chain, the dynamics seem to flow among dyads of participants, granting all participants less hierarchical opportunities for communication and access to information, although some participants in the network hold a more central position than others, for examples participants situated at the intersection between chains. Figure 10 demonstrates these differences – i.e., the participant marked by the arrow, is at a more central position than the member marked in the circle.

**Figure 10.**



## **Dynamics of Information Transmission and Learning Paradigms**

Comparing the findings of SNA Information Centrality with those of Content Analysis within the context of learning paradigms reveals an interesting notion. Content Analysis clearly identified pattern Category 3b, The Multi Chain, and Category 4b, The Branch and Chain, as conveying high levels of course related discussions; however they ranked low on the SNA Information Centrality measurements (Category 3b at 0.16, and Category 4b. at 0.36). Whereas Category 1, The Star, rated high in the Information Centrality (9.1), but not as high as course related discussions are concerned (44 percent in Category 1, as compared to 55 percent in Categories 3b and 4b).

These two different measuring concepts highlight the debate around the meaning of learning. The SNA Information Centrality approach implies the paradigm that perceives learning as the dissemination of information – or the “sage in the box” paradigm (Sherry, 1996). In this paradigm, Category 1, The Star, would be the preferred model, as it is obviously capable of effective dissemination of information. Categories 3b and 4b, on the other hand, appeal to the paradigm perceiving learning as a two-way communication process wherein learners engage in dialogue among themselves, with their e-tutor, with the learning materials, and social interactions are perceived as supporting the construction of knowledge (Sherry, 1996).

The two different methods of measurements highlight two different perceptions of the meaning of information:

The SNA Information Centrality measurement implies the perception of information is a commodity, which is disseminated from a central resource, accessible and reachable by all participants.

Contents Analysis implies the perception that information is an entity that is constructed by many participants, each contributing their portion, and each enjoying the mutual processes of sharing and constructing an entity collaboratively.

## **Discussion**

E-tutors are expected to support quality learning, not by simply transmitting information, but rather by facilitating intensive and engaging debates among learners. Achieving these expectations require informed decisions regarding the support and feedback needed at various points of the learning process. Creating such an intensive and closely supported learning environment, however, may increase workloads for e-tutors. In attempting to sustain quality learning, e-tutors will face a conflict situation wherein the more intensive the discussion, the more messages will be generated, thereby creating an ever increasing quantity of information for e-tutors to read, process and provide feedback on.

The EC concept suggests a way of reducing the amount of messages e-tutors will need to process, while obtaining the high levels of information vital for sustaining informed decision making to support quality learning. The visual patterns represented by the six categories described earlier in the paper can serve as indicators, highlighting the probability of members' involvement in course related discussions, as shown earlier, where patterns depicted in Category 3b, The Multi Chain, and Category 4b, The Branch and Chain, showed levels of 55 percent course related discussions. E-tutors can utilise these patterns as content indicators to identify levels of course related discussions, and focus their reading around a selected sample of messages from each of the pattern categories emerging in their discussion forums. The dynamics of the interaction represented by the EC patterns may indicate instances where critical thinking, or social presence, can be detected; however, pursuing these issues is beyond the scope of this paper.

Visual patterns also reflect on the style of moderation and the tutor intervention practiced, illustrating centralised and non-centralised dynamics of interactions, and indicating levels of authority and influence delegated to participants in the discussion. For example, Category 1, The Star, depicts a centralised situation where a specific individual holds more authority and can practice more influence than any other participant in the group. Having obtained this information, the e-tutor can decide whether this style of moderation practiced meets the learning goals of a particular task or phase in the process.

These visual patterns also highlight influential or dominant individuals within the participants, pointing out those individuals who assume critical positions within the network. e-Tutors could benefit from this information, as they could focus on reading messages generated by these key participants, reducing their necessity to read the less influential messages posted by less critically positioned participants. Additionally, e-tutors may choose to assign the influential individuals as co moderators, acting as "teachers' assistance."

The graphic representations facilitated by the EC, enable e-tutors with a powerful tool for conducting periodic formative assessment of the learning dynamics within the discussion forums. The visual maps afforded by the EC concept clearly depicts learning situations where participants are engaged in dialogue or whether students are expecting ready answers from the "sage on the



## **Implications and Future Research**

The EC concept offers e-tutors periodic snapshots of the interactions occurring in Online Learning Discussion Forums (OLDF), helping them visualise the dynamics underpinning the content, and the ways in which they affect the meaning making processes.

The visualisation offered by the EC concept help facilitate:

1. Quality learning, where frequent well-informed and relevant feedback is provided to the learners
2. Efficient processing of large quantities of messages, offering e-tutors the necessary information for informed moderation, while managing their workload and reducing the amount of messages e-tutors need to read
3. Feedback for e-tutors on their own moderating style
4. Maintaining focused course related discussions
5. Formative assessment of the meaning making process

Further study and development is needed for making the EC concept accessible to e-tutors. Development of the technological aspects of the EC concept will enable its application using any of the prevalent Learning Management Systems – i.e., WebCT, Blackboard and many others.

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## ***Washington Online Virtual Campus: Infusing culture in dispersed Web-based higher education***

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### **Abstract**

Started in 1997, WashingtonOnline Virtual Campus (WAOL) consists of a consortium of 34 community colleges around Washington State to provide asynchronous online learning. WAOL bears many of the features of a loosely coupled organization with its geographically dispersed frontline instructors, fragmented external environment, modularity of courses and supervision, and its use of enhanced leadership and technology to communicate a culture. Recent surveys of its administration, instructors, and staff found disparities in various constituencies' perspectives on the organization's culture, decision-making, values, brand or reputation, communications, and WAOL's authorizing environment. Research suggests that WAOL benefits from some aspects of loose coupling: greater adaptive abilities and responsiveness to the State's college system; "fast" course development and launching; and isolated breakdowns. There is, however, a persistent difficulty in conveying a cohesive culture. There is a perception of WAOL's invisibility among its varied constituencies. This organization is at a crossroads, with the threat of colleges disconnecting from this consortium. WAOL should redefine its direction and purpose, such as coupling with local universities to provide not only associates degrees but full Baccalaureate and/or Masters degrees. It may strengthen its position by improving learner supports, publicizing its decisions, creating a stronger sense of virtual community among the instructors (as in its recent creation of an online community for instructors), increased participative decision-making and use of line faculty and staff insights, and greater course varieties.

**Keywords:** leadership; culture; organizational culture; consortiums; partnership; disintermediation; virtual organization; loosely coupled organization; distance learning; virtual culture; technology mediation

### **Introduction**

When public colleges enter the competitive distance learning (DL) environment for the delivery of higher education and training, they enter the market with distinct advantages and disadvantages. The advantages could be their reputation, their insightful knowledge of their respective learners, the brain trust and skills of faculty, and organizational savvy. Yet, because of tight funding issues as non-profit entities, such organizations often need to function in partnerships and consortiums, often in highly politicized environments. Virtual consortiums have the added challenge of creating a cohesive culture across wide geographical distances, among diverse members with unique specializations, in order to function as a unit. As one researcher has

asked about virtual environments: “How does leadership play itself out in an environment where trust is difficult to build, influence is difficult to express, self-leadership is required, and communication is often ambiguous?” (Zigurs, 2003, p. 342).

## Skunkworks to Establishment

In 1997, Washington State started the Washington State Community and Technical Colleges ONLINE Consortium to make distance education available. Its mission would be “to facilitate new collaborations among colleges in order to improve the educational system of Washington State for students who would otherwise not have educational opportunities” (History and Mission, 2003, n.p.). WAOL’s role has been to increase capacity and access to “anytime anywhere learning through online delivery, support online learners by providing comprehensive online student services, support colleges offering online instruction, and support faculty and staff who serve online learners.” Participative decision-making criteria included pragmatic issues: time-to-delivery of courses, costs versus benefits, academic credibility, administrative implementation and flexible improvability.

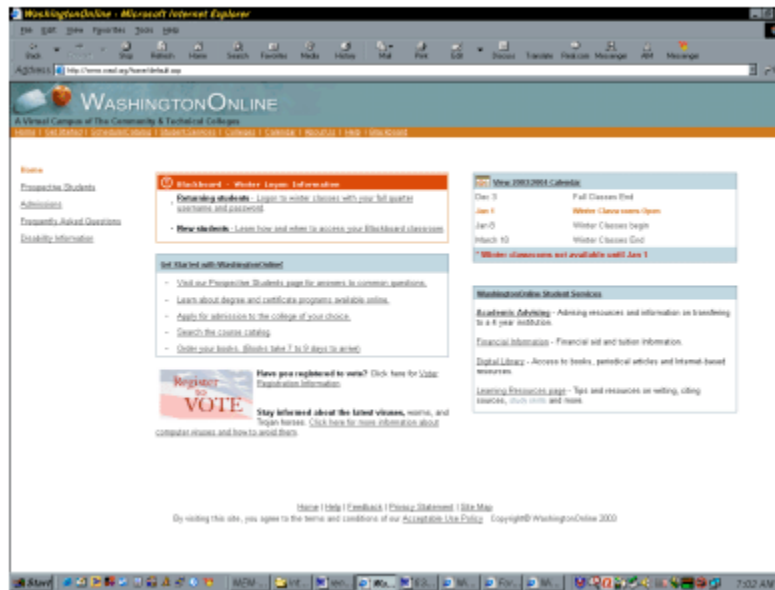
The U.S. Department of Education released an “Issue Brief” in Feb. 1998 that observed the limited nature of distance learning offerings nationwide: “In Fall 1995, a third of the institutions offered distance education courses, another quarter planned to offer such courses in the next three years, and 42 percent did not offer, and did not plan to offer, such courses in the next three years. A much greater percentage of public than of private institutions offered distance education courses: 58 percent of public two-year and 62 percent of public four-year institutions, compared with two percent of private two-year and 12 percent of private four-year institutions. The percent of institutions offering distance education courses also varied by institutional size and geographic region, with fewer small institutions and fewer institutions in the Northeast offering distance education” (U.S. Department of Education, 1998, p. 1). As for the prevalence of the technologies in use, this report found that only a quarter of the institutions offering distance education courses in Fall 1995 used the Internet; the others used two-way interactive video, one-way pre-recorded video, and other technologies (U.S. Department of Education, 1998).

Foremost among WAOL’s achievements has been the institutionalizing of distance education statewide. Broughton, Managing Director of WAOL, says: “WAOL went from a skunkworks-nobody-knows-if-it-will-work short-term project, to an institution within the community and technical college system. WAOL was originally under the radar in many ways, which was an advantage in moving quickly. Now it is very visible and has a terrific technical infrastructure that makes it both more efficient and less flexible” (Broughton, 2003c, p. 1).

Today, WashingtonOnline Virtual Campus (WAOL) serves learners who access the combined higher education and certificated offerings of Washington State’s 34 community colleges. Thousands of students take college courses through WAOL annually, with over 450 electronic classrooms quarterly. WAOL has trained over 1,000 instructors and has about 350 active instructors at any one time. A range of student services is offered online via the World Wide Web. These include admissions, academic advising, bookstore, career resources, digital library and electronic database access (ProQuest), financial information, learning resources, learning centers, student access and student community. WAOL’s website ([www.waol.org](http://www.waol.org)) has become more informative. Its site map shows the service-oriented approach built on a simple and easy-to-navigate structure. The courseware has changed several times: Embanet’s *FirstClass*, to *WebCT*, to *Intralearn*, to the current *Blackboard* setup. The software has had to meet the requirements of functionality, flexibility, technological stability, ease of operation, and user friendliness. WAOL

Virtual Campus emphasizes life-cycle cost of technologies and focuses less on first-cost, for responsible asset management. WAOL supports ProQuest database access and the use of Collegis services for addressing student technology problems 24 hours a day, 7 days a week. Nearly US \$1 million has been spent on the development of courses since 1997 (Carlson, 2003, n.p.).

Figure 1: WashingtonOnline Screen Clip



This research paper will examine WAOL’s current organizational culture and how the WAOL leadership keeps the disparate parts of WAOL connected. This will also probe ways to strengthen this organization as it approaches its seven-year mark. This paper will propose some ideas on how to strengthen geographically-dispersed loosely coupled virtual higher education organizations.

## Research Questions and Approach

Culture may be defined as “the sum total of *all the shared, taken-for-granted assumptions that a group has learned throughout its history*” (Schein, 1999, p. 29). Culture, while often unconscious, determines an organization’s “strategy, goals, and modes of operating” (p. 14). This slice-of-life cultural analysis will examine how culture manifests in this loosely coupled organization. Emailed surveys of current administrators, staff and faculty were sent out in December 2003 and again in January 2004. These qualitative surveys asked for open-ended descriptions of WAOL’s organizational culture in relation to its course design, technology decisions, policies, practices, and treatment of students – all major “flex” points of decision-making responsibility. How do administrators, instructors, and staff perceive how this current culture has come about? By design? Evolution? Happenstance? The survey also probed what respondents through comprised WAOL values; the brand or reputation of WAOL; the method(s) by which culture is communicated; how a sense of organizational cohesion is created; how quality standards for teaching are established; how decision-making is made (centralized, dispersed); areas for improvement in communicating culture, and the authorizing environment of the organization. (See the appendix for a complete copy of the survey.) In addition, artifacts such as policies and emails from WAOL were examined. Two emailed interviews were also done with Broughton, the Managing Director of WAOL. The results of the surveys were collated into a

rubric, and the comments were analyzed for themes and recurrent ideas. Anomalies were also recorded and analyzed, in the context of researched information about WAOL. An assumed limitation of surveys involves its inability to address all relevant issues. Oftentimes, surveys address espoused values rather than hidden ones (Schein, 1999). Online surveys also have a tendency of low response rates (Watt, Simpson, McKillop, and Nunn, 2002).

## **WAOL Organizational History: 1997 – Present**

A state-level ad hoc group met to consider the distance education options in Spring 1997. They debated whether to create a separate virtual college with its own accreditation (after the Western Governors University model) or to provide services through a distributed model. “This entailed creating a platform that an individual student could access in order to choose among a number of courses offered by various colleges. The student would remain enrolled at his or her home campus, but would be able to take a course offered by any other campus over the Internet” (Bleak and Chabotar, 1999, p. 3).

Moneys for the early years were piecemeal, with germination funds coming from the community and technical college presidents’ respective budgets (interest from the Educational Technology Initiative). This starting amount would be US \$530,000 for the first two years. The money was managed by Spokane Falls Community College (SFCC), where WAOL would be housed. By the end of 1998, ONLINE had offered its first and second groups of courses. In January 1999, it offered its full first, second and third groups of courses, and redevelopment of its first term courses had begun by March 1999. The use of courses created by lead-instructors, overseen by fellow professors in the field, and taught by college instructors (with some minimal modification), set curricular standards for the Washington State branding. WAOL also allowed hosting of individual college-based courses (owned by the respective higher educational institutions) and the teaching of co-owned courses between WAOL and the colleges. The groundwork had been laid around coursework, technology, and collaborative faculty and administrators. An additional Fund for the Improvement of Postsecondary Education grant in 1999 further strengthened this fledgling organization. “Today, the grant is nearly over and all our budgets are for the first time in one place,” writes Broughton (Broughton, 2003a, n.p.).

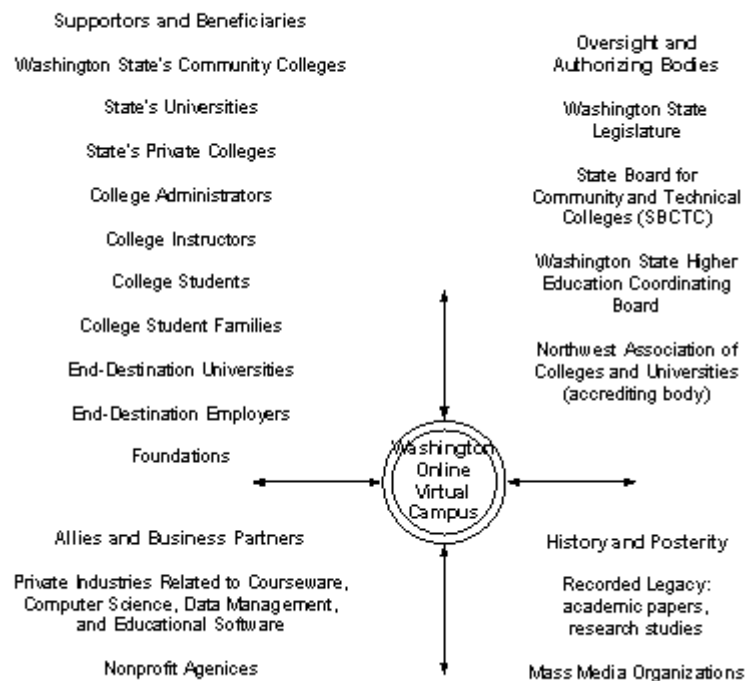
## **Authorizing Environment**

Various stakeholders influenced this upstart. As a complex organization linked to a large open-systems heterogeneous system of various community colleges, state-level agencies (the State Board for Community and Technical Colleges), and its micro-environment of SFCC, WAOL was highly dependent on its external environment for funding and college student enrollees. It not only had to self-manage, but coordinate public relations, educational course creation and delivery, technological innovations in courseware, and its identity within the higher education structure of Washington State. WAOL strategically grafted itself as a “shell” structure on the existing 34 State community and technical colleges. As the “WAOL About Us” part of the SBCTC site explains: “WAOL is not a college, so it does not directly register students, grant credit or determine grades. To register into a WAOL VC course, you need to enroll in a community or technical college that offers the course or courses you want to take. Once you are accepted as a student of the college, you can then register into the online course” (“WAOL About Us”, Dec. 2003, p. 1). External survival issues include the use of a mission (strategy and goals), means (structure, systems, processes), and measurement (error-detection and correction systems), in levels of organizational culture (Schein, 1999).

As a learning organization par excellence, WAOL used its sensing mechanisms to gauge the faculty and community-wide attitudes towards distance education. To anticipate fast-moving changes in a limited budgetary environment, it reached into private industry for understandings of Web-based courseware and changes in the field. It set state-wide policy for distance education – the academic standards, the courseware technologies, the grading scale, and the employment of faculty. It created a syllabus and other form templates. It created an online training course for prospective online instructors. It built a semi-private Web presence for administrators and faculty and a public Web presence for adult learners. This organization identified relevant research on distance education – its methods, technologies, leadership practices, and policies – and integrated the learning into their own procedures. It soft-sold distance education to a skeptical faculty through state-level conferences and its mere existence, and it reached out to the public through mass media. It formed alliances with industries like The Boeing Company for mutually-beneficial collaborations and funding.

Accreditation of the partner community colleges, credentialing of the professors, their direct supervision in their respective work places, and the high standards of course creation and measurable course outcomes for each WAOL course, ensure the courses' legitimacy and academic and professional transferability. This approach saves moneys because there is no new physical plant, no capital-funded buildings. Rather, the structure built is in cyberspace and through political, business, and educational alliances. Much effort goes into the maintenances of such strategic alliances which are "fragile," but yet must be "strong enough to withstand a rapidly changing competitive landscape," notes Isabella (2002, p. 48). Successful alliances require collaboration, mutual compatibility, and the realization of the difficulty of achieving the shared aims alone (Dyer, Kale, and Singh. 2001). Figure 2 shows the complicated stakeholder issues in WAOL's authorizing environment.

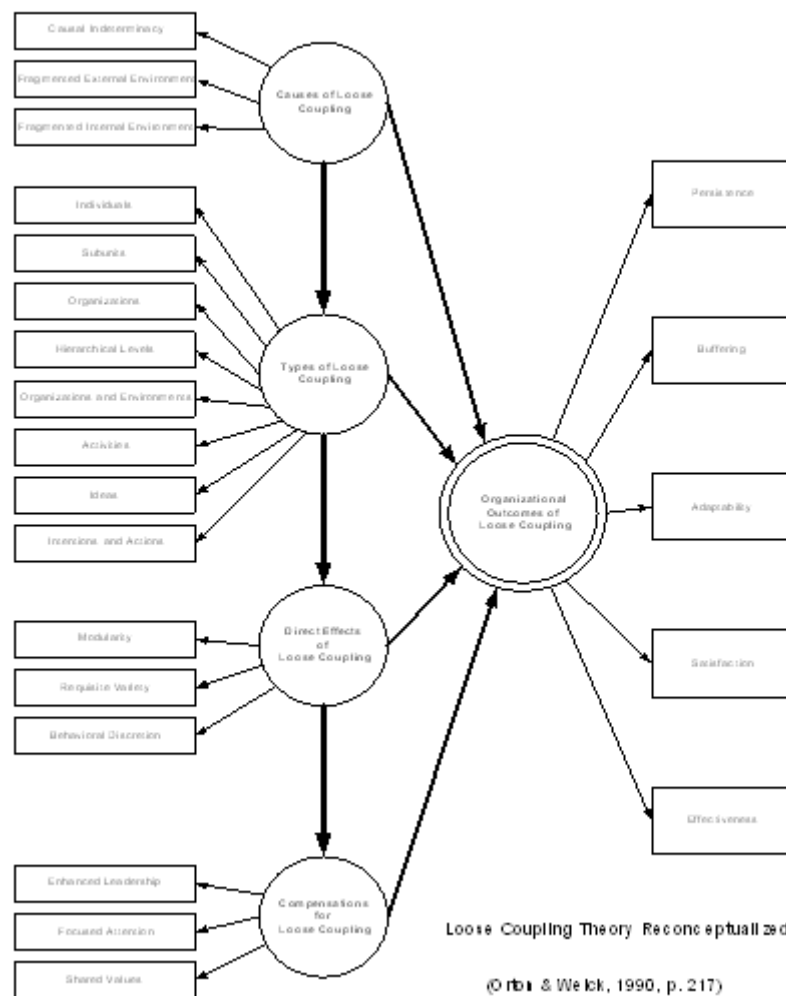
**Figure 2.** WashingtonOnline Authorizing Environment



## WAOL as a Loosely Coupled Organization

WAOL apparently fits Orton and Weick's re-conceptualization of a loosely coupled educational organization in its fragmented external environment. Its wide number of external stakeholders adds a degree of "causal indeterminacy" to this organization (Orton and Weick, 1990). WAOL-linked institutions function as a combination of geographically-dispersed relatively autonomous independent units, which influence each other as modular building blocks. Different layers of administrative hierarchy also lead to greater dispersion of power. Relatively speaking, WAOL also fits this model because it is "relatively inexpensive to run, because it takes time and money to coordinate people" (Weick, 1976, p. 8). The task-induced tight coupling may mean ad hoc committees and temporary groupings within WAOL to achieve particular governance decisions, technological setups, exchanges of information or course development, but such tight couplings are transitory. Whether or not loose coupling is effective has been studied in various organizations, with mixed results. Raghunathan and Beekun (1989) concluded that in terms of strategy, loose coupling efficacy depends on a combination of environment and strategy (as cited by Orton and Weick, 2001).

**Figure 3.** Orton & Weick's "Loose Coupling Theory Reconceptualized"





Frontline colleges and instructors have behavioral discretion in the educational approaches, albeit within the defined boundaries of the lead course setup. Courses have evolved in different ways on campuses, with requisite variety. The “organic evolved culture” applies to these various institutions based on the need for local adaptations and “mutations.” Campus instructors practice self-determination about the curricular issues, based on the course curriculum set by the lead instructors (Orton and Weick, 1990, p. 217). Different campuses demonstrate varying subcultures and diverse levels of institutionalization of the DL model.

To maintain high academic quality, WAOL supports planned online and email interactions between learners and instructors in lieu of face-to-face socializing, in-class discourses, and classroom community cohesion. This aligns with best practices in the research literature: “An online course, properly crafted, builds in many opportunities for students to advance their learning through responses and discussions. Ideally, this interaction is neither haphazard nor left to serendipity, though spontaneity may figure in it” (Maeroff, 2003, p. 42). While some online courses require synchronous study – e.g., a set time when all learners would “meet” online in a shared MOO/ MUD (multi-user object oriented or multi-user domain space), with an instructor coordinating real-time discussions and calling on students electronically – the WAOL courses are asynchronous for convenience and flexibility. To address learning disabilities and preferences, the various courses entail a variety of teaching and learning approaches. Students are encouraged to reach out to instructors by email, phone, or in-person for support and direction. Electronic resources, simulations, downloadables, and lectures are available for student use throughout the quarter. Ongoing assessment through assignments, quizzes, and interactivity in classes strengthens academic rigor.

Loose coupling makes WAOL more adaptive and responsive to the needs of the Washington State’s college system. Courses may be created and launched within a quarter. WAOL has sensitive sensing mechanisms regarding the external and internal environments – with its ties to state government in Olympia through the Washington State Board for Community and Technical Colleges (SBCTC) its distance learning coordinators on each campus, its faculty spread throughout the State, and its direct access to learners through email interchanges and surveys.

Job satisfaction may be another effect of loose coupling “because it affects efficacy, conflict, security, and social contacts.” Specifically, the modularity of such organizations may encourage more frontline self-determination and sense of efficacy. Objectives may be set at the local level. Agreement on controversial issues may not be necessary between certain loosely coupled units. Also, a haven of psychological safety may exist where “deviance and experimentation” are protected (Meyerson and Martin, 1987, as cited by Orton and Weick, 2001, p. 215). The creation of smaller units of frontline instructors at a college may offer “increased task visibility, monitoring and social exchange among employees” (Orton and Weick, 2001, p. 215). Adaptability is yet another effect of loose coupling. This effect suggests that the organization may experiment more, share collective judgment and integrate dissent more effectively than organizations that are tightly coupled. In a loosely coupled organization, breakdowns may be isolated and kept from ripple effects throughout the organization through buffering.

Making changes through a loosely coupled organization, however, may be difficult. WAOL trains staff in each college, but staff turnover is constant, so training also must be continuous. Any change in process or policy must go through multiple organizational structures. The effects of the loose coupling may be observed as in a number of factors: persistence, buffering, adaptability, satisfaction and effectiveness (Orton and Weick, 1990). Persistence, defined as “stability, resistance to change, and continued operation,” is seen as an outcome of loose coupling. Theorists

argue that changes are easier to execute in tightly-coupled homogeneous organizations. WAOL, therefore, may have reduced responsiveness to centralized planning and change because of its loose organizational structure (Orton and Weick, 2001). For example, its attempts to unify DL on college campus has resulted in more dispersed individualized distance learning course offerings independent of WAOL.

WAOL works with and as state-level administration. The Advisory Committee directing WashingtonOnline Virtual Campus consists of members of various constituencies from DL administrators to industry personnel. Deans and department heads lie outside the direct hierarchical setup. Line instructors, including lead ones (who create original courses or who order books and do administrative work for particular clusters of courses, such as all English 101 courses), exist outside of this structure, too.

WAOL is a permeable organization, with a low cost of entry for instructors – once instructors have become part of the community college system. In other words, instructors must meet the hiring requirements for the community college system, with job descriptions listed with various human resources offices. Once an instructor is in, their competence is assumed, and the instructor becomes an atomized actor in relation to the learners via this system. To teach particular courses, instructors need to request a particular course, and the DL administrators on each campus would have to sign off on the assignment to keep the decision-making local. Entry for learners is also relatively low-cost, in terms of tuition and open-college entry standards (usually a pre-test with a range of pre-college and college-level score outcomes in math and English).

## **Online Faculty Training**

WAOL created a four-week online training course for instructors desiring to teach through them. The curriculum addressed issues of WAOL policies, pedagogical approaches to online teaching, community building, online communications, and courseware technologies. This course also imbued incoming instructors with their cultural stamp – of high quality and student-centered services. This course is one major source of WAOL branding and culture-building. It socializes instructors into WAOL standards and practices. Here, the course builds a common language and shared concepts, creates a sense of WAOL identity, and defines the nature of authority and relationships. It also defines the allocation of rewards and status, all elements of Schein's internal integration issues in cultural layers of organizational development (Schein, 1999, p. 30). Organizational learning continues past the course – with frequent broadcast emails to instructors, an online shared space for collegial exchanges, annual representation at the SBCTC New Faculty Orientation in the Fall, and the occasional WAOL-sponsored conference.

This over-arching structure has meant that faculty would be hired through the campuses and supervised by the deans or department heads. While this simplified human resources management, that setup may have left a supervision gap for the instructors. Only in the situation of a student complaint would a campus's DL coordinator get involved. After all, on-campus personnel do not often lurk online or solicit student surveys from learners of WAOL online courses. WAOL itself does not have the staffing to provide such evaluations, and can not evaluate instructors directly because of contractual issues in this collective bargaining system. Instructors, who teach based on their higher education and experience, learn by doing. Then, many learn by doing or "intra-task learning," as is typified by those who work in virtual environments (Lindbeck and Snower, 2000). Statistically, faculty remain with WAOL for varying periods, but some have been with WAOL from its inception. Some have quit after a year or two, according to Broughton.

Some teach “more or less according to other factors in their lives” (Broughton, 2004). One even has been teaching from out-of-state.

## **Oz Effect Technologies**

Leadership exploits current technologies for the “Oz effect.” Administrators maintain a listserv to communicate with instructors; they use this to notify them of deadlines, new technologies, and staff changes. Individual email accounts maintained by the staff also ensure their accessibility. Telecommunications is also used for more timely issues, such as grade queries. A toll-free telephone number helps core staff connect with all their constituents. A faculty section on the WAOL website offers an easy way to exchange digital information and files. The richness of interactive communications technologies allows for a number of connection points for WAOL instructors. WAOL’s “tele-presence” coalesces around its information provided by its website and the listserv messages. The various connections are formal, but staff members maintain a colloquial tone and timeliness in responses that welcome communication. These professional relationships are typified by trust. “When we do not trust the competence of people, we supervise them. Traditional organization hierarchies suggest cascading rungs of police and inspectors. When people’s jobs occur in different functions, we coordinate them . . . These presumptions of incompetence are the roots of towering hierarchy, functional isolationism, and over-specialization” (Whitney, 1994, p. 127). Research on virtual universities suggests that tight coupling is an important pre-requisite for control and governance (Guri-Rosenblit, 1999, p. 172).

## **WAOL Culture: Survey results**

Leaders embed cultural elements through primary and secondary means. Primary embedding mechanisms involve what leaders “pay attention to, measure, and control regularly,” how they react to critical incidents, observed criteria for scarce resource allocation; deliberate role modeling and coaching; the distribution of rewards, and the “observed criteria by which leaders recruit, select, promote, retire, and excommunicate organizational members.” Secondary “articulation and reinforcement mechanisms” may involve structural elements: “organizational design and structure; organizational systems and procedures; organizational rites and rituals; design of physical space, facades, and buildings; stories, legends, and myths about people and events; formal statements of organizational philosophy, values, and creed” (Schein, 1999, p. 98). How has WAOL evolved? Three administrators, 21 instructors and two staff members responded to the emailed survey. The following provides an overview of the survey results, with a special focus on lessons learned that may be useful for other similar “virtual” organizations.

### ***Administration***

One outstanding aspect of the administration was their view of themselves as the middle-person between various entities. Two of the responses observe that WAOL only has a limited role in course development, contingent on funding. WAOL strives to be “supportive of helping find ways to make good ideas happen.” Technology decisions are seen to be “at the mercy of vendors and CTC (community and technical colleges) system resources,” as well as student accessibility. WAOL administrators find themselves caught between various stakeholders. One respondent described policy-making as “trying to balance the needs for order/ structure/ consistency to expedite services for all in the CTC system against limited resources and many competing interest/ viewpoints.”

Personality clashes unduly affect such organizations, particularly if the decision-making is “fairly closed and directive.” Operational decision-making falls to the responsible staff member, but non-operational ones apparently are made by higher administration – which is perceived as not fully connected with frontline management and staff concerns. Another suggests that major decisions are made by a core team within WAOL. Other times, a more public process is followed via “system councils and commissions to get as much feedback and buy-in from colleges as possible.” Major decisions regarding policy are addressed by the Washington Association of Community and Technical Colleges (WACTC) WAOL Executive Board, often with approval by the appropriate commission (Instruction, Student Services, or both). As one notes: “The matrix is as complex as are the relationships to the many constituents in the CTC system.”

### ***Participative Leadership***

One administrator describes the necessary dynamics of a consortium to have every stakeholder feel involved in every decision, given the highly public environment. The stakeholders may be perceived to be the students, but also involve the State’s 34 community colleges and the State’s college’s presidents and legislators. With so many competing interests, it may be difficult to show a “strong cohesive image with clear goals,” writes one administrator.

The organization’s culture evoked a broad divergence of opinions. One suggested that the culture is a mixture of all three factors (design, evolution and happenstance) as well as the personalities of those involved. Another suggested that the decisions of the original Steering Committee have remained unchanged through these years, so this respondent opted for “deliberate design.” Another suggested that evolution plays a role because of gaps in leadership, and happenstance because “we all work independently and don’t have much direct supervision so that has created a fairly loose structure.”

The administrators unanimously agree that WAOL uses a service-oriented model to sustain student-centered learning. One emphasizes the “single-point contact” approach: “WAOL’s goal is to provide access to students in a way that is easy to figure out, always available, and of high quality. Another named “inclusiveness, responsiveness, innovation, accountability . . . Because WAOL is sort of an ‘outsider’ (not affiliated with any college), we have to maintain good relationships with all the colleges and need to be perceived as being flexible and accommodating of colleges’ needs.”

### ***Brand Under Radar***

The brand “penetration” into the larger awareness seems low. “I think the brand is little recognized outside the current college staff who engage with the WAOL endeavor and the students who are taking classes. Most community members who are not attending classes remain unaware of its existence. For those who have taken classes, taught, or administer DL programs, the reputation is that WAOL does a difficult job well.”

### ***Electronic Acculturation***

Communications with frontline instructors seem based around email conversations and the acculturation through the four-week training program. Lessons from the culture are reinforced through interactions. “All instructors are required to take a completely online training course that uses the WAOL instructional design model. When instructors contact our office, we try to

‘remind’ them of the rules we live by, for instance, that classes are supposed to be interactive, etc. The internal WAOL site <http://www.waol.org/info> has a lot of information about the WAOL standards and culture as well. WAOL encourages instructors and college staff to use this site. WAOL instruction staff has periodic meetings where we talk about what is working and what isn’t. We brainstorm solutions to problems. I think it is very important that we stay open all the time to new ideas and to the possibility that we really can figure out a way to fix everything.”

### ***Electronic Connectivity in Question?***

While its website is informative, a recent survey by WAOL found that “most users are not spending much time on our website. We need to work on that or figure out another way to communicate to our users.” In other words, the opt-in piece needs to be stronger for this high-tech distributive model to work fully. Even at the college level, many do not understand WAOL in the way administrators would like – as trying to “help colleges serve their students better. I think some college staff see WAOL as a competitor.” This administrator continues: “I also think some college staff and some students think WAOL has more power than it does.”

### ***Low Culture of Sharing Courses***

The concept of sharing courses has worked only for some. This administrator writes: “We need to figure out how to share courses among colleges better. This job will require both a cultural shift and possibly a different cost model.”

WAOL has struggled to promote a sense of cohesion given its disparate physical locations. One administrator described weekly phone meetings which are effective for “specific, shared task(s).” They have also tried face-to-face meetings, which are less successful because of their brevity and the hindrance of travel. One writes: “At one point, we figured out that we were trying to work too much in a hierarchy and decided that we should just call each other more often. For instance, if you get an email and are not sure what the other person wants, just pick up the phone instead of getting mired down in emails that are being misunderstood. If you need something, don’t go up the chain and hope that your request goes back down to the right person. Instead, just call (or email) the person you need help from.”

### ***Faculty***

Twenty-one faculty members of the 350 currently teaching for WAOL responded to the survey or six percent. One faculty suggested that the lack of instructional support and guidance after the initial four-week WAOL course caused hardships. “There is a great deal of freedom; however, there was also a lack of support and guidance. The two don’t always work best, especially when starting into a new way of learning. In my experience, faculty were to receive assistance from their peers regarding curriculum development; however, the course design consisted of one online class. In retrospect, I think having a series of short courses would have been helpful.”

Faculty do not perceive much power regarding the choice of courseware technologies, with a number responding that they do not have “any input” on changes to the course platform. A majority said they were not familiar with the administrative decision-making that went into the selection of courseware. Several mentioned the need to be forewarned of upgrades to the software earlier. One anomalous response suggests a line-level of power and decision-making: “I have been able to make all of the technology decisions with my technical advisor from my college and

this has proven to be an outstanding experience.” Others express a non-interest in the decision-making regarding technologies.

### ***Course Stasis***

One faculty member expressed frustration at the inflexibility of changing some content: “I am a seasoned instructor and am not impressed with the lack of changes in the course content over time. I am appalled by the use of the same discussion questions and virtually the same test questions quarter after quarter.” Some faculty members noted that instructors are “free to customize the course as we want within a certain framework” or to “tweak” the courses as needed. Another observed that the courses tend to be “traditional” versus “dynamic or avant-garde.”

### ***Policies on the Front Lines***

A number of respondents were apparently unaware of WAOL policies. One decried the administration for focusing less on education than on a commodity. “The administrators are not all educators. That is a mistake. Many of the policies are not informed by education needs. At times has the fill of a product/ commodity-driven policy format.” Others expressed their own non-participation, but satisfaction nonetheless: “Clear enough, flexible, in process and getting better.” Another described WAOL policies as “open, instructive and fair.” Specific policies were criticized. The limited grade spread (an “A” is a 4.0 instead of a range from 3.5 to 4.0), the disallowance of unregistered students to access the Blackboard site before the second week of the quarter, precipitous technology changes without sufficient instructor preparation (e.g., switch to Web submission of grades, registration for course assignments, upgrading of courseware), and the lack of student emails for some accounts, were all concerns.

Faculty expressed concern at the lack of student awareness of WAOL, while acknowledging its popularity. Some learners do not realize their instructor for their courses would not necessarily be on the learners’ own respective campus. They observed that each of the colleges have different levels of service for learners. Faculty perceive WAOL’s culture as a product of both evolution and happenstance. One sees WAOL as a result of “the needs of part-timers to eat” as well as a welcoming of “younger persons more likely to know the technology and more likely to be hungry enough to invest in the level of amount of work that is needed to develop a course.” Others see turf wars as causal agents in WAOL’s current culture: “We knew we needed to get into online, but turf wars are a hassle with colleges and WAOL and some other tri-college organization in the State fighting it all out for the students and the bucks.” Some cited the organization’s integrity and push for student access to “equal education.” Some who say they are not aware of WAOL values, express a correlating apathy regarding the culture. “Don’t know, don’t care. It’s my course and my values in teaching it that matter to me.” The question on WAOL brand engendered quite a bit of confusion. “Low contact, market driven,” one writes. Another lists “reputable and pioneering,” “tight and efficient,” and “positive.”

A majority of instructors said that they “never talk” to any WAOL instructors who are not in their own discipline; rather, they discuss issues with their own campus peers. Several suggest that improved communications – through a listserv or e-newsletter – would be useful for two-way communications, instead of the one-way broadcast emails. Not surprisingly, faculty members describe “significant isolation associated with this form of teaching.” While some know other online instructors, they do not feel WAOL particularly fosters such interrelationships. Many connect tenuously through “regular emails, but I think a sense of cohesion is lacking. We all teach

for our own campuses and have little if any link with each other.” Approximately 50 percent of respondents advocated greater cohesion, while the others expressed their lack of desire for greater cohesion.

Instructors highlighted various ways that they establish quality standards: customizing courses, being accessible, staying on top of technological glitches, soliciting student feedback, setting high standards and expectations for student behaviors (particularly being respectful, responsible and fully prepared for the assignments), staying on top of developments in respective fields, making standards of instructor-student interactions explicit from the beginning, and providing individualized attention and help. Others want more feedback and peer exchanges regarding their teaching. “I would like to know how other teachers handle problems, records, new ideas . . . An online newsletter telling us what’s up at WAOL and some new “tips” each term/ month would be great!”

Only one respondent seemed to have had direct decision-making input (in drafting WAOL guidelines) but felt rebuffed. “Although it seemed like they were asking for input, there seemed like there was already a direction in which they wanted to head.” Even lead instructors seem to eschew participative decision-making: “Major WAOL decisions regarding curriculum and instruction appear to be made and executed centrally, including assigning instructors to classes.” Yet another described never being asked for feedback on any decision. This respondent continues: “The decisions just sort of appear to drop out of nowhere via email. Some say that decision-making within WAOL is “dictatorial,” with an overemphasis on “teaching efficiency.”

## ***Staff***

Two staff members highlight the limitations to WAOL’s power as a consortial organization. “WAOL as an entity set up the initial requirements for course design, and had a peer group for each developing course review the curriculum to make sure it was appropriate. WAOL can suggest design features, but cannot enforce adherence. WAOL provides the technology for the courses, but cannot develop or affect curriculum,” reads on response. Another mentions financial constraints.

Policymaking apparently hails back to the original founding vision. Staff see strong adherence to stated policies. “WAOL staff strives to practice what it preaches. A great deal of communication is sent to colleges and faculty to make sure participants are aware of how to use WAOL to their best advantage.” Changes in policies are affected by more than just staff or management desires.” Another expresses a sense of frustration with changes in WAOL’s structure with its integration into the SBCTC, with more human involvement and a lack of understanding by “very upper management.”

Echoing the findings from administrators and faculty, the staff expressed positive observations about service to students. “No student request is discounted, and we always try to solve a problem before it escalates, or forward it to the person who is authorized to deal with it,” writes one staff respondent. Another writes: “Excellent treatment of students!” and highlights WAOL’s professionalism and timeliness. Staff members express awareness that every email, telephone, or one-on-one communication carries some of its culture forward.

Staff respondents emphasize student feedback for checking quality standards. Some colleges apply more oversight in surveying students who take online courses. Problems with instructors are relayed to the respective colleges for their management. Instructors with repeated “issues” are

brought to the attention of the hiring colleges. According to staff, quality is maintained by listening to its various constituents. “WAOL-related services also rely on feedback from DLC’s (distance learning councils), faculty and students. Problems are resolved as soon as possible, with corrections made so they do not recur. Staff monitors services vendors to make sure they are meeting our expectations, and steps in to correct any shortcomings.” While staff observes cohesion at their direct work levels, one observed a lack of cohesion at the higher levels of management. One observes that some standards-setting may be contravened by union intervention. Both staff respondents suggest that decisions are made in a centralized way after much information-gathering and consensus building. One notes that not all staff feedback or recommendations were followed.

WAOL makes decisions with forethought: “All changes have to be weighed carefully because not just one entity is affected. The challenge is trying to decide which changes are necessary, then how to best time, communicate, and implement any change to a greatly diversified group. The bottom line stakeholder is the student body. How they are affected depends on what change needs to be made.” Staff members see distance learning coordinators as key contacts in communicating changes to WAOL faculty, support staff at the college levels, and students.

## **Analysis**

### ***Adding Value***

Competition has sprung up with WAOL for the offering of homegrown college-created online courses delivered off their own servers, with their own individual contracts, with courseware providers like Blackboard. With the budget crunches of the early 2000s, these partnerships have been under pressure. Many institutions have built their own former-fledgling distance education offerings, and many are balking at paying WAOL fees, so there have been withdrawals of offerings of WAOL courses. Some colleges are now only offering WAOL courses where their own faculty members are unable to provide a particular course, in order to lower chances of competition for full-time equivalences (FTEs).

WAOL needs to fight the disintermediation of its consortium members by offering additional value through new services or additional alliances. Broughton suggests that WAOL may work with four-year colleges to offer value to the community and technical colleges and students. “I think we probably will in the next year, and if we do, I think we will make certain that the partnership benefits community and technical colleges and their students, and that the partnership is one that could be offered to other colleges as well.” says Broughton (C. Broughton, 2003c, p. 2). Broughton believes that colleges stay connected with WAOL, because the cost to belong is low at US \$6,500 per year and because it offers value. WAOL also offers a comprehensive course listing for the colleges at no direct cost to the institutions. It offers technical backend that is easier for colleges to use. With over a million hits a month, the website adds value (Broughton, 2003b).

### ***Transforming Culture through Internal Sharing of Expertise***

WAOL could strengthen its position by creating a “collective mind” of shared knowledge among its dispersed members, who share a “cognitive interdependence” (Yoo, 2001). Failure to exchange information in a useful manner, may blunt a “team’s capacity to learn” (Cramton, 2002). It needs to capitalize on line-staff expertise and insights for some of its changes. Researchers suggest the benefits of the “collegium” among “people who have equal influence,



equal information, and a decision scheme of majority rule are able to apply multiple perspectives to situations and combine their perspectives to create a collective judgment. Because of the relative advantages of the loosely coupled form in creating collective judgment, it is not surprising that collegium forms . . . are heavily represented in loose coupling literature” (Orton and Weick, 2001, p. 214). Dissent must be preserved for loosely coupled organizations to survive, something called “unified diversity” by Eisenberg (1984) (as cited by Orton and Weick, 2001). Dissent may lead to improved adaptability, creativity and survival (Orton and Weick, 2001). WAOL employs quarterly student surveys, email communications with faculty and DL administrations, frequent telephone communications, and real-time responses for error-detection.

### ***E-leadership Needed***

Weick’s (1993) concept of “theatrical improvisation” as a metaphor for organizational change suggests that it occurs from “ongoing, unplanned, and situated adaptations of organizational members in their everyday work life.” Building on this, Orlikowski (1996) suggests that such changes may be “shared, amplified, and sustained” for long-term organizational change (as cited by Avolio, 2000). Applied in the context of e-leadership, as is the case for WAOL’s hybrid leadership, Avolio’s Adaptive Structuration Theory suggests the need for leaders (administration and faculty) to create social and knowledge structures that are accessible and effective “to produce a change in attitudes, feelings, thinking, behavior, and/ or performance with individuals, groups, and/ or organizations. E-leadership can occur at any hierarchical level in an organization. It may be associated with one individual, or shared by several individuals as its locus changes over time” (Avolio, 2000, p. 616). This theorist cites a study by Kahai and colleagues that showed that “group members were more supportive of each other using a groupware system designed to enhance collaborative interaction when the leader was more participative versus directive” (as cited by Avolio, 2000, p. 621). There are risks to introducing new technologies to a group, so such changes should be actualized with care (Avolio, 2000).

### ***Clan Orientation***

Orton and Weick (2001) suggest that tight cultural couplings or “clan orientation” through shared values and communications – are critical in holding a loosely coupled organization together (p. 213). This organization’s culture seems to be dominant on some key points: ease of access, professional and timely staff responses, and support of learners and instructors. Beyond a few core values, however, much disparity apparently exists depending on the various lead instructors and other faculty for courses and different colleges’ leadership and support for DL. The organization’s continuance of its name WAOL for the Virtual Campus shows that its geographical and academic branding “trademark” value is to be protected. Brand value in online programs is critical. Goldberg and Seldin note that regional institutions will now face “an overwhelmingly crowded competitive scene” from national and even international levels (Goldberg and Seldin, 2000, p. 300). WAOL assiduously protects its reputation. As a non-profit state-funded organization, WAOL has stayed close to its roots as a non-commercial entity, with no sales of student email lists, no advertising. “We are seeing the emergence of a new type of organization that undermines the familiarity needed to sustain trust. New information technologies are resulting in what some call a ‘virtual organization,’ where personal contact among employees is transitory or even non-existent. People are being asked to trust others whom they know little or not at all. They are being asked to make themselves more vulnerable to others than ever before” (Shaw, 1997, p. xiv). WAOL has long-standing links to the community which enhances its level of mutual trust, but more work may also be done in this area.

## ***Requisite Course Variety***

Building on a history of locally-developed courses, this organization may broaden its course offerings. While the learning is “anytime, anywhere,” it is not also “any path, any pace.” The pegging of the WAOL quarter to that generally of the various community colleges of the state influenced the 10-week quarter schedule of WAOL, because of instructors’ need to submit grades by certain deadlines for colleges through WAOL’s administrative offices. WAOL may support the development of courses that are co-taught by instructors at different schools; courses that combine for interdisciplinary studies; course that create virtual communities with others abroad; courses that involve a travel component; hybrid varieties or a number of other permutations. An online or email-based tutorial service may be made available to learners.

Broughton identifies WAOL culture as “collaborative, consortial, experimental, (and) mellow” (C. Broughton, 2003c, p. 1). According to the research literature on loosely coupled systems, leadership usually manifests as “strong” or “subtle.” WAOL apparently follows the latter course, described by Boynton and Zmud (1987) as “to simultaneously provide centralized direction and coordination, while recognizing the value of increased discretion.” (Orton and Weick, 2001, p. 212) Weick himself advises that educational administrators pay more attention to the “glue” that maintains loosely coupled systems: “Since channels are unpredictable, administrators must get out of the office and spend lots of time one on one – both to remind people of central visions and to assist them in applying these visions to their own activities.” (Orton and Weick, 2001, p. 212) Research on loosely coupled organizations would suggest that more “focused attention” on the various relationships and “small step strategies” on carefully selected targets within the system would be useful in enhancing the organization (Orton and Weick, 2001). The growing popularity of e-books and online libraries may well strengthen WAOL’s delivery of digital course materials. How ready is WAOL Virtual Campus to broaden its mandate, and can it bring its allies and detractors along with its virtual future?

## **Application to Other Settings**

One may argue that a “virtual” leader of a loosely coupled virtual higher education organization needs to promote a coherent culture in order to unify the widely disparate elements of a geographically-dispersed organization. The “shimmer” between self-identity as stand-alone units and team identity as part of the whole may be disruptive to the larger organization’s coherent identity. Feelings of disconnection by line faculty and staff, and misperceptions about intentions behind administrative decisions may threaten a decentralized organization’s functions. Engaging the far-flung elements of a loosely coupled organization into the heart of decision-making through participative leadership may be one hedge against disconnection.

Ways to build cohesion include the consistent interchange of information among the members of the group. This information should be made available among the various constituent members in an open exchange to avoid information siloing, whether this compartmentalization of information comes from geographical, cultural, departmental, field, language, college, or other divides. Addressing such pooling of information resources will require planning and continuing support.

Another important virtual leadership element would be the ability to transition the organization to face evolving external realities and competition. To keep the organization intact through the needed changes, the constituent members will need to be heard and their concerns addressed; the diversity of ideas needs to be encouraged through respectful communications and openness. The early-state attentiveness to its constituents through sensing mechanisms is important to maintain

for a holistic 360-degree perspective. Particular attention should be paid to schisms between different internal constituents, simply represented here as administration, faculty and staff. “Virtual” leaders should demonstrate leadership through clear communications – through messages, policies, and consistent embodied/ practiced actions – to maintain a sense of institution focus and unity. An active and continuing public relations push for brand penetration may also promote the organization and its service to a wide range of stakeholders.

Strategic alliances which are mutually rewarding should be maintained, and those that no longer support the consortium should be discontinued. An evaluation of these partnerships should be established not based on past practices per se but on current benefits and future potentialities. New consortium partners that may bring benefits to the learners should be brought on, even if that involves a change in mandate or temporary discomfort as changes are made to reorganize the “modules.” Fresh constituencies may be served, and with their integration, other changes may be made to the structure. Savvy leaders must pay attention to organizational needs for change based on other adjustments. From the loose coupling perspective, leaders need to identify the parts of the organization that need tightening, those that need loosening and those elements that need to be disconnected altogether.

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## ***Interaction and Immediacy in Online Learning***

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### **Abstract**

This article presents the concepts of interaction and immediacy and discusses their theoretical frameworks, implications, and relationship with one another. The authors propose the development of a new conceptual model and recommend additional antecedent research.

**Keywords:** distance education; interpersonal interaction; immediacy; theory; theoretical framework

### **Introduction**

In the historical progression of distance education from correspondence courses to online learning, opportunities for interpersonal interaction have increased. Early correspondence courses enabled learners and instructors to interact, albeit with a significant time lag between message production and reception. Videoconferencing made it possible for learners and instructors to interact in real-time, and it also facilitated learner to learner interaction, although the required equipment often made this means of distance education too costly for mainstream use. With the emergence of the Internet, particularly email and the World Wide Web (WWW), it became possible to promote high degrees of interaction within a technologically mainstream and cost-effective learning environment.

This progression has not only been driven by the myriad of interactive opportunities available in the online environment, but also by the belief that high levels of interaction, particularly those which promote social engagement, can have positive effects on the learning experience. Indeed, numerous studies suggest a positive correlation between relationally supportive online environments and cognitive learning (e.g., Gunawardena, 1995; Wegerif, 1998; Rovai, 2002). Collaboration with faculty and other students can be a strong motivating force for learning (Johnson and Johnson, 1999) and online instructors are frequently encouraged to actively construct a positive social dynamic in parallel with the content delivery (Palloff and Pratt, 1999). Failure to fully consider the relational dynamics in the online setting may produce greater feelings of isolation among distance learners, reduced levels of student satisfaction, poor academic performance, and increased attrition.

Interaction alone, however, is insufficient to create a positive social dynamic in the online classroom. Although increased interaction among participants may lead to more opportunities for positive social penetration, it may also lead to competition, “flaming,” and other forms of negative communication. Research demonstrates that the integration of verbal and non-verbal immediacy communication behaviors lets instructors move from mere interaction to authentic intimacy and interpersonal closeness. In short, an instructor’s understanding of interaction and immediacy dynamics will affect the nature and quality of communication in the online learning environment.

Accordingly, this article will highlight the concepts of interaction and immediacy, and discuss their theoretical frameworks, implications, and relationship with one another. The authors will also recommend additional research related to interaction and immediacy, and propose the development of a new conceptual model.

## **Interaction**

Interaction is at the heart of the online learning experience. One of the foundational theories in distance education is Moore’s transactional distance theory, which emerged from his doctoral research into educational programs where the instructor and student were physically separated (Moore and Kearsley, 1996). Transactional distance was conceived as a function of dialogue, structure, and learner autonomy. Moore postulated that distance was a pedagogical phenomenon, rather than a function of geographic separation, which existed in face-to-face classes as well as distance classes. According to Saba (1999), this was a significant shift in the pedagogical perspective toward distance education, which “moved the discourse on the subject from its Newtonian paradigm and grounded it in a contemporary postmodern science. According to this dynamic (time-sensitive) and systemic (self-organized) view of mediated communication, what is important is communication and construction of knowledge” (para. 6).

Moore (1989) acknowledged that: “Interaction is another important term that carries so many meanings as to be almost useless unless specific sub-meanings can be defined and generally agreed upon” (p. 1). Therefore, he proposed three distinct types of interaction in distance education: learner-content, learner-instructor, and learner-learner. *Learner-content interaction* is the process in which students examine, consider, and process the course information presented during the educational experience. According to Moore and Kearsley (1996), “Every learner has to construct knowledge through a process of personally accommodating information into previously existing cognitive structures. It is interacting with content that results in these changes in the learner’s understanding” (p. 128). *Learner-instructor interaction* is communication between the instructor and the student in a course. In the case of online learning, such interaction usually occurs via computer-mediated communication and is not strictly limited to instructional communication that occurs during the educational experience, but may include advising, offline communication, and personal dialogue. Finally, *learner-learner interaction* is communication between two or more students in a course. Such interaction often occurs via asynchronous computer-mediated communication, although it may include other forms of interpersonal and small group communication, online and offline, that occurs during the duration of a course.

This threefold interaction construct has been extended and adapted by subsequent researchers in the area of distance and Web-based learning. Hillman, Willis and Gunawardena (1994) added *learner-interface interaction* to reflect the growing role of technology in the distance education process. They noted: “When dealing with any tool, it is necessary for the user to interact with the device in a specific way before it will do his or her bidding” (p. 34). They also distinguished

between learner-interface interaction and the necessary mediation of an interface which occurs in any interaction, by noting that for the technically-challenged learner, the interface itself becomes “an independent force with which the learner must contend” (p. 35). Burnham and Walden (1997) observed interactions within a distance education environment and concluded that *learner-environment interaction* should be added to the model. They defined learner-environment interaction as “a reciprocal action or mutual influence between a learner and the learner’s surroundings that either assists or hinders learning” (Findings section, para. 2).

Anderson and Garrison (1998) added *teacher-teacher interaction*, *teacher-content interaction*, and *content-content interaction* to the mix. Teacher-teacher interaction considers the professional development efforts of teachers to engage one another in order to enhance their own pedagogical abilities. Such interaction might occur at conferences, in seminars, or through informal electronic communication (p. 105). Teacher-content interaction, generally viewed as a prerequisite to the distance course, is proposed as another component in the interactive model, because new technologies enable teachers to interact with the content far more easily and creatively than in the past. The authors note: “The opportunity for teachers to interact with the learning content provided by other teachers is increasing dramatically as a result of the WWW” (p. 108). Similarly, they note the growing sophistication of online tools such as databases, search engines, and intelligent agents, and propose content-content interaction. While they note that this is the most embryonic type of interaction, more recent technologies such as blogs, wikis, and content syndication aggregators merely increase the likelihood of content-content interaction actually occurring in a meaningful way.

Although not explicitly defining her model as *learner-context interaction*, Gibson (1998) drew on ecological systems theory and proposed a model of the distance learner in context. Gibson argues that the distance learner simultaneously engages and interacts with multiple contexts which extend beyond the classroom, such as family, workplace, peer groups, and larger institutions such as government, mass media, and organized religion, extending out to interaction with the larger culture (p. 117).

Dating back to Moore’s threefold model of interaction, these approaches have generally emphasized the “who” of interaction at the expense of the “what.” In other words, these various models of interaction have largely focused on which entities were interacting rather than clearly defining the nature of interaction itself. Wagner (1994) distinguished between interaction and interactivity, and noted that neither concept had been sufficiently defined. She thus wrote: “Simply stated, interactions are reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutually influence one another” (p. 8). In distance education, such interactions are interpersonal and occur within an instructional context. She distinguishes between such human interaction and interactivity, which she describes as a characteristic of the technology itself. “Interactivity may eventually be viewed as a machine attribute, while interaction may be perceived as an outcome of using interactive instructional delivery systems” (p. 26).

Anderson (2003a) revisited the issue of defining interaction in distance education. After surveying a variety of definitions and characteristics of interaction, he returned to the Wagner (1994) definition as a suitable foundation. “Despite concerns about the application of Wagner’s simple and broad definition of interaction, her definition does seem to include the essential components and nature of interaction without compromising or restricting the wide range of possible types of interaction” (p. 130). He then proposed a comprehensive model of interaction which included student-teacher, student-student, student-content, teacher-content, teacher-



teacher, and content-content interaction. In a follow-up effort, Anderson (2003b) confirmed his previous definitional conclusion, but distinguished between “interaction leading to learning in any informal context and those types of interaction that occur in a formal interaction context” (Interaction and Education section, para. 1). He then developed a more sophisticated interaction model of e-learning incorporating all six types of interaction in an expansive framework, which covers a variety of online learning models including independent study, paced collaborative learning, structured learning resources, and communities of inquiry.

## **Immediacy**

Mehrabian (1967) defined immediacy as the extent to which selected communicative behaviors enhance physical or psychological closeness in interpersonal communication. In other words, immediacy can be understood as “those communication behaviors that reduce perceived distance between people” (Thweatt and McCroskey, 1996, p. 198). Immediacy can have verbal and non-verbal forms. Non-verbal immediacy would therefore be understood as a sense of psychological closeness produced by physical communicative behaviors such as facial expression, eye contact, posture, proximity, and touch. Verbal immediacy would thus be a sense of psychological closeness produced by word selection. For example, the use of the word “we” fosters increased relational closeness and is considered more immediate than the comparable statement “you and I.” Anderson (1979) summarizes the impact of immediacy:

The more immediate a person is, the more likely he/ she is to communicate at close distances, smile, engage in eye contact, use direct body orientations, use overall body movement and gestures, touch others, relax, and be vocally expressive. In other words, we might say that an immediate person is perceived as overtly friendly and warm (p. 545).

Mehrabian (1971) found that such non-verbal behaviors increased sensory stimulation, thus resulting in more intense, affective, and immediate interactions (p. 77). Mehrabian suggested that *non-verbal* behaviors such as leaning toward another, assuming a position close to another, touching another, facing another, and looking into another’s eyes are immediacy producing behaviors. Additional non-verbal immediacy producing behaviors include positive head nods, purposeful gestures, and vocal expressiveness (Andersen, Andersen, and Jensen, 1979). Mehrabian (1971) and later Gorham (1988) described *verbal* immediacy behaviors as linguistic differences in expression from which feelings of like and dislike are inferred. Asking questions, using humor, addressing individuals by name, initiating discussion, and sharing personal examples are verbal behaviors which produce immediacy and contribute to a sense of psychological closeness.

Although immediacy was originally developed in the interpersonal communication context, it has been frequently used in instructional communication research during the past two decades. With the rapid diffusion of the Internet into a mainstream communication medium, there has been a clear emphasis on the dynamics of interpersonal communication in the online environment. Although not necessarily referencing the immediacy concept by name, there is significant conceptual overlap between examinations of traditional immediacy producing behaviors and discussions of online interpersonal communication dynamics.

## **Interaction and Immediacy Intertwined**

Online education environments offer the opportunity for increased interaction – regardless of how many types of interaction are considered – than previous models of distance education. In particular, there has been significant emphasis in the literature about how to promote interpersonal interaction with the tacit understanding that high levels of interaction will produce positive results, particularly results related to social dynamics. Such an emphasis on (and perceived benefits associated with) interpersonal social dynamics is consistent with the constructivist framework, which appears to be dominant in online learning pedagogy. An unstated assumption, however, appears to be that promoting interaction will lead to positive communication behaviors such as instructor immediacy, social presence, and community in the online classroom. Accordingly, much of the literature (particularly best practices texts) integrates the concepts of interaction and immediacy into a seamless presentation extolling the benefits of social interaction.

De Verneil and Berge (2000) noted: “It is important in most Web-based instruction that a designer explicitly includes learning in social context... since the learning process takes place within a social framework” (p. 236). They argued that promoting student interaction through class discussions, are integral to effective online learning. Harasim (1989) examined online courses and drew a similar conclusion about the value of student interaction and discussion. She added: “*Knowledge building* occurs as students explore issues, examine one another’s arguments, agree, disagree, and question positions. Collaboration [learner-learner interaction] contributes to *higher order learning* through *cognitive restructuring* or conflict resolution, in which new ways of understanding the material emerge as a result of contact with new or different perspectives” (p. 55) (emphasis added).

Kearsley (2000) declared: “The most important role of the instructor in online classes is to ensure a high degree of interactivity and participation” (p. 78). Parker (1999) similarly highlighted the pedagogical benefits of student interaction, but offered the caveat that while it is a much-needed component of online courses, it is less likely to occur without the careful orchestration by the instructor:

The sentiment of many faculty is to teach the same course offered on campus with the addition of a few more handouts. To those experienced in the art of distance delivery, it is evident that the addition of a few more handouts is not the solution for interactive course design . . . The challenge lies in the refocusing of the instruction to embody a component of interaction (p. 16).

Such refocusing might include the use of group projects, running dialogues about complex issues, and by making class discussion a significant part of one’s course grade. Parker also observed that the instructor role likely takes different forms throughout the duration of the course. Early in the term, the instructor is likely to lead by example and direct the discussions but, as the weeks progress, the instructor should assume the role of “provocateur” rather than “academician” and produce no more than 20 percent of the class input (p. 16). She also encouraged faculty to incorporate “real life” stories and humor to foster a discussion-friendly climate, recommendations which could be classified as immediacy-producing behaviors, even though they were not labeled as such. This is similar to De Verneil and Berge (2000) who suggest that instructors ask students to post a biography, request active participation, provide feedback to students about their participation level, provide a virtual caf#233; for socializing purposes, and make synchronous chat rooms available should students want to interact in real-time (p. 236-237).

Berge (1997) conducted a survey of instructors teaching online at the post-secondary level to better understand the pedagogy of online courses. While no single model of online learning emerged, Berge found that most instructors deliberately fostered a student-centered rather than teacher-centered environment through various instructional methods. “Predominant among these were discussion, collaborative learning activities, and authentic learning activities (i.e., inquiry, problem-based activities, case studies, projects, peer critique and support), and self-reflection” (p. 44). Woods and Ebersole (2003) reported that encouraging student interaction in personal discussion folders contribute to positive faculty/ student relationships, positive relationships among students, a sense of community, and satisfaction with the overall learning experience. In short, such efforts can be used to encourage openness among the students and ideally lead to a high level of student interaction. As interaction increases, particularly interaction of the type which promotes immediacy, opportunities for social penetration abound. These opportunities, in turn, foster a climate of interpersonal interaction that may have positive benefits for interaction in course-related discussion areas.

Although they examined distance education delivered via interactive television, Fulford and Zhang (1993) found that the perception of interaction, rather than a quantitative measure of interaction, was the critical predictor of student satisfaction. “This finding strongly suggests that learner satisfaction may be attributed more to perceived overall interactivity than to individual participation. Instructors teaching thorough interactive TV probably should be more concerned with overall group dynamics” (p. 18). In a similar vein, Clow (1999), Phillips and Peters (1999), Roblyer (1999) and Hacker and Wignall (1997) all concluded that a student’s perception of sufficient interaction with instructors and other students is positively correlated with his level of satisfaction with the overall online learning experience. A ‘sufficient’ level of interaction with faculty generally creates a “sense of personalization and customization of learning” (Boettcher, 1999, p. 43) and helps students overcome feelings of remoteness – perhaps the greatest obstacle to fostering a student’s sense of community in online distance learning (Everhart, 1999, p.12). Arbaugh (2000) found that perceived interaction difficulty was negatively correlated with student satisfaction, while perceived instructor emphasis on interaction was positively correlated with student satisfaction. Arbaugh concluded: “It appears that the flexibility of the medium and the ability to develop an interactive course environment play a larger role in determining student satisfaction than the ease or frequency with which the medium can be used” (p. 43).

Gender also appears to influence the online communication dynamics. Women are more likely to seek supportive communication environments (Brunner, 1991; Burnham, 1988; Ryan and Hicks, 1997) and thus are likely to have significantly different expectations when it comes to frequency and nature of communication online. Instructors attempting to enhance interaction must also keep in mind that messages from males engaged in threaded discussions tend to be more certain, confrontational, autonomous, controlling, and abstract than messages from females, which tend to be more empathetic, and cooperative (Blum, 1999). Arbaugh (2000) found that women participated more than men in class discussions and were more collaborative, while the men were more competitive. Herring (2000) found that female students participated more when the instructor actively promoted a civil and focused discourse. In other words, both gender and communication style influenced levels of interactivity and immediacy-producing behaviors, and were more consistent with female online communication than with male communication.

LaRose and Whitten (2000) borrowed from social cognitive theory as a framework to develop a unified construct of interaction and instructional immediacy for Web-based courses. Specifically, they sought to create a model that incorporated not only teacher and student immediacy, but also

computer immediacy, which they proposed as a result of an ethnographic content analysis of three Web courses. Within this social cognitive framework, they concluded:

There are three possible sources of immediacy in the virtual classrooms of the Web that may create feelings of closeness: 1) the interactions between teacher and students (teacher immediacy); 2) interactions between students (student immediacy); and 3) interactions with the computer system that delivers the course (computer immediacy). Collectively, these sources constitute instructional immediacy. In each case, learning is motivated either through social incentives (e.g., approval for good behavior, expressions of interest in the student) or status incentives that recognize or enhance the status of the learner. The immediacy mechanism is enactive if it results from the interaction between a specific individual learner and one of the other agencies present in the classroom. Immediacy is vicarious if it operates through the observation of other learners as they interact (p. 336).

LaRose and Whitten's three loci of interactions attempt to formalize the relationship between the basic building blocks of interpersonal interaction in the online classroom, while focusing on the resulting social dynamics (e.g., immediacy) which are often antecedent.

## **Recommendations**

Although the LaRose and Whitten (2000) model more explicitly connects interaction and immediacy than most research, it is sufficiently representative in that it presents interaction as a necessary dynamic within the online classroom, which results in positive social and educational benefits. Unfortunately, such co-mingling of interaction and immediacy insufficiently considers the extent to which immediacy is both a consequence of interaction and a contributor to it, as well as omitting the extent to which interaction can lead to non-immediate results. Accordingly, we recommend revisiting the definitional framework of interaction itself with an eye toward immediacy and other social dynamics.

Wagner's (1994) foundational definition described interaction reciprocal objects and events which influence one another. Such an admittedly broad definition successfully advances beyond a one-way or transmission model of communication into a two-way or dialogic model (Carey, 1989), although the learner-content interaction pushes the boundary as the majority of the interaction is likely to be part of the learner's "internal didactic conversation" (Holmberg, as cited in Moore, 1989, p. 2).

Building on a similar foundation of reciprocal influence, Rafaeli (1988) distinguished between three types of communication sequences: two-way (non-interactive), reactive (quasi-interactive), and fully interactive. According to Rafaeli:

Two-way communication is present as soon as messages flow bilaterally. Reactive settings require, in addition, that later messages refer to (or cohere with) earlier ones. Full interactivity (*responsiveness*) differs from reaction in the incorporation of reference to the content, nature, form, or just the presence of earlier reference (p. 119).

This model offers a significant advance to an understanding of interaction as mere reciprocal interaction, but proposes that the nature or content of the communication events distinguish between levels of interactivity.

Although considering human-computer interaction, Laurel (1991) posited that the perception of interactivity existed along a continuum which contained three variables: frequency, range, and significance. Frequency identified how often choices were available; range identified how many choices were available; and significance identified how much the choices really affected the situation. She later added the feeling of participation, indicating how immersed one felt within the experience. Accordingly, a highly interactive experience would be one in which someone had frequent opportunities to make a wide variety of significant choices and in which they felt engaged and immersed within the experience.

In contrast with these two definitions of interaction, it seems that the online learning interaction literature has been so focused on what things are interacting (e.g., learner, instructor, content, computer, environment, etc.) that we have missed the nature of interaction itself. As a result, as researchers and practitioners we have tended to see any of these pairs, which bump up against one another, as evidence of interaction. We thus propose the development of a more nuanced model, one which distinguishes between limited dyadic communication (which we will label transaction) and more qualitatively substantive communication (which we will label interaction). Transaction would be understood as a limited engagement to meet a specific need (or toward a specific purpose) of one of the participants with little intent of ongoing dialog or communication; while interaction reflects an active engagement with the expectation of some level of ongoing communication. Interaction, therefore, goes beyond transaction.

For example, in current parlance, a purely lecture or instructor note-based online course (with no discussion or question and answer dialog, just lectures/ notes and tests) would likely be classified as having a high level of learner-content interaction, a moderate level of learner-instructor interaction, and little to no formal learner-learner interaction. In the proposed new framework, such an educational experience would reflect the presence of learner-instructor transaction and, depending on the student and their approach to the course materials, either learner-content transaction or learner-content interaction. Simply reading the texts would be considered learner-content transaction, while creating new materials, seeking out additional Web materials and posting content, or reorganizing the materials into a new presentation, would reflect learner-content interaction.

Figure 1. Proposed Model of Interaction

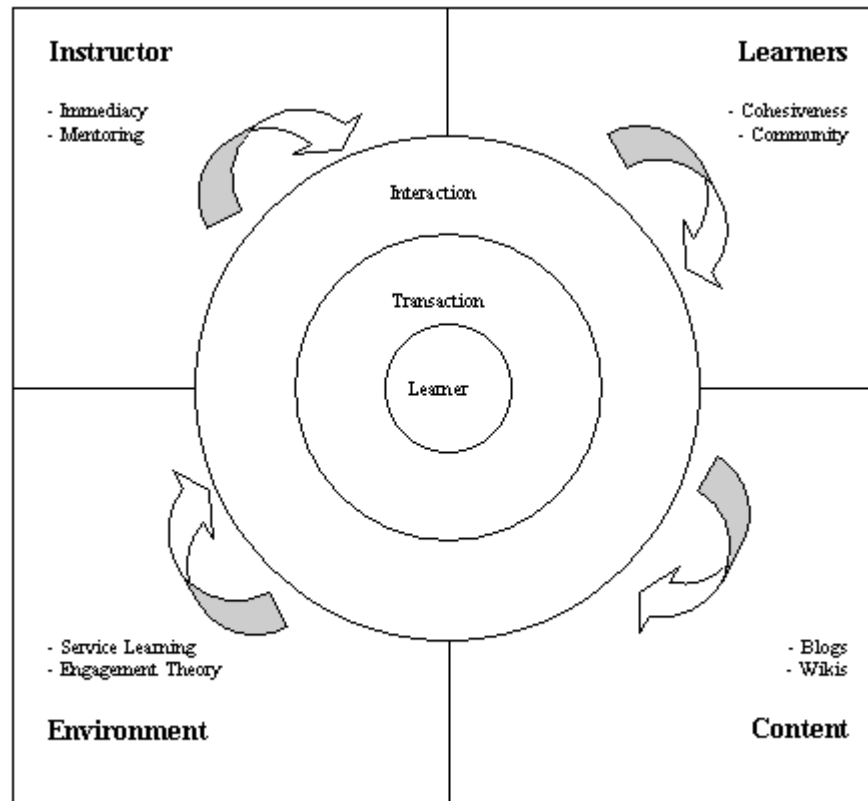


Figure 1. Proposed Model of Interaction

Figure 1 shows this new proposed model of interaction. Essentially, the learner is in the center and has opportunities for four potential realms of engagement: instructor, learners, content, and environment. In each of these realms, the learner can ignore or be deprived of engagement altogether, engage in transactional communication, or engage in fully interactive communication by moving outward from the center of the diagram. On the outer edges of the diagram are a few of results and provocateurs of interaction. Immediacy, therefore, is seen as a benefit of interactive learner-instructor communication, since active ongoing communication is likely to result in an increased feeling of psychological closeness between the learner and instructor. Similarly, the presence of such immediacy is likely to promote increased levels of interaction because learners and instructors are developing a safe and rich interpersonal environment, and this is reflected by the arrow which both comes from and returns to the interaction sphere.

Such a proposed framework goes beyond distinguishing between one-way and two-way communication, and attempts delineate between limited functional communication and rich dyadic and group engagement. Furthermore, this transactive/ interactive framework can be used to address both interpersonal interaction (learner-instructor, learner-learner) within the same framework as non-personal interaction (learner-content, learner-environment), which can otherwise be difficult.

It should be noted that there is nothing inherently wrong in this model with mere transactional communication. We do it frequently when we ask someone the time, watch the evening news, read a journal article, or listen to a recorded lecture. There are even selected social dynamics

which can result from transactional communication (e.g., para-social dynamics, some perceptions of immediacy); however, the many pedagogical and social benefits presented in online learning best practices generally pre-suppose the movement beyond transaction into interaction.

Admittedly, this is an initial consideration of this new model of online learning interaction. There remains the need for additional research and development to validate this construct. In addition, there is a significant question about whether such a model should consider both positive and negative effects of interactive communication. For example, high levels of learner-learner interaction can produce an educationally rich learning community, or it could also lead toward socially rich, yet intellectually shallow, dialogue and groupthink. Perhaps there should be positive and negative ramifications included in such a robust model of interaction. In addition, there should be additional consideration of how many technologies and dynamics are both the result of and contributor to interaction.

Regardless, there is a need for instructors to distinguish between the mere presence of particular dyadic communication and the presence of genuine interpersonal and contextual interaction as they seek to improve the online educational experience. Furthermore, the development of such a model, corresponding instrumentation, and empirical research, would further the ends of effective online education.

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## ***Faculty Opinions towards Introducing e-Learning at the University of Bahrain***

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### **Abstract**

E-Learning is an important tool for delivery, interaction, and facilitation of both teaching and learning processes. Faculty members at the University of Bahrain's College of Education are being encouraged to become involved in e-learning activities. To assess faculty opinions on e-learning, a questionnaire was sent to 30 faculty members of the University's College of Education to determine how they perceive e-learning, and how they might choose to integrate it into their everyday teaching activities. Data was collected and analyzed by using descriptive statistics. Results indicate that faculty generally perceive e-learning as a positive force in helping students' achieve their learning objectives. Answers to this questionnaire, however, also indicated areas of weakness: specifically that baseline technological and human resource prerequisites are necessary to support e-learning, and that these baseline prerequisites are not yet available at the University of Bahrain. Other baseline prerequisites are: staff training, well prepared online courses and learning materials, sufficient groundwork for the smooth transition from traditional modes of learning towards e-learning delivery, and the implementation of a more robust technological infrastructure to support all the technical aspects necessary to launch and sustain e-learning.

### **Introduction and Literature Review**

Educational processes have undergone many of changes during the last century. From print learning materials mailed to students' homes, to educational radio broadcasts, to educational television programming, to recent forays in interactive Web-based e-learning, ongoing technological changes have been reflected in the evolving role of teachers and students in the learning equation. Technological changes – particularly Web-based e-learning technologies – have resulted in new curriculum design and teaching strategies, new and emerging organizational structures, and it has even transformed learning itself. McKenzie (1998) said that technology would transform the act of teaching, whether or not teachers or students are ready for this inevitable change. According to McKenzie, when faced with new technology, students and/ or teachers would likely adopt one of two approaches: they would either embrace it or they would dismiss it. In other words, teachers and students will either learn how to use new technology, or they would ignore it – the later of which would put them at disadvantage compared to their more technologically literate peers. Ballard opined that technology is reshaping today's school systems and educational institutions by offering students new ways of seeing and learning; giving teachers new ways of teaching and imparting knowledge; and administrators new ways of organizing our educational system (Ballard, 2000).

Innovations in teaching and learning have emerged, and educators are in the midst of becoming more adept at using new educational technologies. This fact is reflected in our changing language. Terms such as “open education,” “distance education,” “distance learning,” “virtual learning,” “remote learning,” “online learning,” and “e-learning” are now part of educators’ everyday lexicon. Use of such terminology helps to define and shape the creative innovations taking place. However, many overlaps can be seen within these terms. Urdan and Weggen (2000), for instance, found that that online learning constitutes just one part of e-learning; and further define it as learning processes that take place via the Internet and in blended classroom contexts. They specified that e-learning covers a wide spectrum of applications and processes, including virtual classrooms and digital collaboration.

With the introduction of the Internet, an invention of the US Military designed for robust communication and sharing of scarce resources, and CERN (<http://public.web.cern.ch/public/>) the world’s largest particle physics laboratory and the birthplace of the Web (Hauben, 2002), there has been a boom in applications commonly known as e-business, e-commerce, e-government, and e-learning. However, as these technologies are applied in different geographic and cultural contexts (such as Bahrain), their application is often not so clear cut. How is Web-based technology used in a given cultural/ educational context? How effectively will it work? How will people deal with it? Educators the world round are seeking to come to grips with the human complexities of Web-based learning technologies.

To explain what “exactly” is taking place, terms are helpful. However, terms are still being defined. The term “e-learning,” for example, has generated many different definitions according to Carry and Willis (2001), who broadly define e-learning as any form of learning that utilizes a computer or technological network for delivery, interaction, or facilitation. Becker (1991) opines that e-learning covers a wider set of applications and processes, which include Web-based learning and virtual classrooms. Hall and Snider (2000) define e-learning as the process of learning via computers over the Internet and Intranets. For the purposes of this article, the author will say that e-learning can be defined as “acquisition and use of information distributed and perceived by technological means.”

Definitions are important, and when one adds the ability of the Internet to bridge time and space, e-learning truly has the ability to re-invent itself again and again, particularly when it is applied in different cultural contexts. Digital educational delivery knows few, if any, boundaries. e-Learning has the ability to bridge cultures and open doors to new ways of thinking. Clearly such implications are beyond the scope of this article, but are important to consider when introducing a new learning technology into any cultural context.

Cultural implications aside, there are several cogent reasons for adopting and implementing e-learning into an educational system:

1. **The growth of information technology:** e-Learning has become an ideal delivery vehicle for education and learning
2. **It is information rich:** e-Learning offers both teachers and learners access to any where, any time “information rich” resources
3. **Alternative learning strategy:** e-Learning can reach those previously denied access (e.g., students with physical disabilities)

4. **Blended learning:** e-Learning can augment traditional classroom offerings, thereby freeing up valuable resources and expanding the offering to greater numbers of campus-based students (Spender, 2001).

In light of e-learning's flexibility, Spender (2001) asserts that e-learning is the next generation of learning. However, Spender also cautions that the shelf-life of knowledge is usually very short in today's globalizing economy; therefore, one way students can meet the demands of their continuous learning curve, is to engage in e-learning a time and place convenient to them. e-Learning thus derives numerous benefits to meet the objectives of continuous learning. It:

- Offers links to useful learning materials
- Provides online materials and self-assessments to guide students' learning processes
- Increases access to content-rich learning materials
- Facilitates interest via increased interaction
- Provides immediate feedback and positive reinforcement
- Creates a flexible learning environment conducive to students' busy lifestyles and employment schedules
- Provides ongoing support for teachers
- Creates balance between different sources of information
- Facilitates dialog between and among teachers and students (Haugland and Wright, 1997)

The literature examines the importance and benefits of e-learning as an educational tool. The literature also shows that educators are concerned with increasing student access to educational resources and communication processes (Hartly and Robertson, 2001). Nonetheless, when introducing e-learning into a new context, "buy-in" from teachers is essential. Put simply, even though there is a recognized need for increased access, e-learning technologies cannot be used effectively without the full support of those who will use them (e.g., faculty and staff). For example, teachers must transition away from traditional methods of teaching, towards a more constructivist pedagogy that will enable students to derive full benefit from e-learning (O'Donnell, 1991). The literature also shows that teachers who hold "less traditional" views on education, are more likely to perceive e-learning a viable approach in their everyday teaching activities (Becker, 1991; Hannafin and Savenye, 1993; Kook, 1997; O'Donnell, 1991; Salmon, 2000) and that in general, teachers tend to hold positive attitudes towards e-learning (Kleiman, 2000; Minton, 2000; Teather, 2000).

But the process is more complicated than simply saying teachers are "open to e-learning." According to Mason (2001), comprehensive staff training initiatives are necessary to allow those involved to become proficient in the technical and educational aspects of e-learning. Training initiatives must integrate "learning about educational design" with hands-on "learning how to use the technological devices and tools" to teach. Teachers therefore must be encouraged to become active participants in the design and implementation of e-learning processes, instead of having it imposed upon them. Involving teachers in the design and implementation phases compels them to

become proactively involved, and more importantly, supportive of e-learning initiatives at the institutional level (Mason, 2001).

For e-learning to take root and grow, a robust technical infrastructure must also be in place to support all the technical aspects necessary for the production of course materials, delivery of e-learning courses, and teacher and student support (Mason, 2001).

Implementing e-learning in an institutional setting therefore requires comprehensive strategic planning. Davidson and Schofield (1997) stated that changing the educational offering through technology requires employing effective implementation plans and strategies. For example, sound e-learning course planning requires attention to developing course contents that include sound pedagogical underpinnings, and are suited for e-learning delivery (Biddara and Dias, 2003). Attention to various sub-strategies to facilitate the adoption e-learning is also required to ensure seamless integration of e-learning across an organization. Planning is clearly a complex process, one which should ideally be institution-specific (Davidson and Schofield, 1997).

At the University of Bahrain, Jamlan (2002) asserts that adoption of an e-learning model should not happen quickly, nor should it be based on an inflexible transition process. Instead, the transition to e-learning at the University of Bahrain should be flexible, gradual, and integrate with existing structures, processes and organizational cultures. According to Jamlan, “buy-in” among those individuals needed to bring about such transition at the University of Bahrain is essential. It therefore is best to combine old processes with new (e.g., educational strategies, etc.), and by substituting the old with the new, until a final “desired” model of e-learning emerges that “fits” the educational and cultural contexts unique to the University of Bahrain. Jamlan also asserts that to successfully implement e-learning, a supportive technological infrastructure must be in place, and it must be resourced with the human expertise necessary to design curriculum, offer student support, teach effectively, etc (Jamlan, 2000).

Collaboration with other institutions engaged in similar e-learning initiatives is also desirable to lower costs of introducing such a system. Laurillard (2002) concluded that collaboration with external organizations is a “must” for educational institutions contemplating introducing e-learning into its educational offerings. McKenzie (1998) furthers Laurillard’s work, contending that the implementation of e-learning educational offerings and supportive infrastructure must not be rolled out piecemeal, but instead be an entrenched element of an overall educational budget in order realize economies of scale (i.e., leveraging work and resources to lower human resource costs and expenditures on space, resources, and equipment).

Implementation of e-learning also requires that quality assurance procedures be put in place, including regular measurements such as surveys to determine if students do, in fact, receive adequate access to technology and are recipients of effective e-learning (Magnusson and Svensson, 2000).

## **The Case for the University of Bahrain**

It is clear from the brief literature review above, that “buy-in” from faculty, support staff, and students – those who will be using the system – is central to its long-term success. This paper presents the results of a survey undertaken to gauge how the University of Bahrain’s faculty members perceive e-learning. Results of this investigation are anticipated to add a Bahrain perspective to current literature on this subject. It is suggested that other educational institutions in the region, and throughout the world, might also benefit from the findings of this survey.

## **Background**

Bahrain, like other countries around the world, is exposed to the Internet and its various technical applications. As such, Bahrain is seeking to maximize its potential in all sectors of its economy, from government to the private sector. The Internet has application in many aspects Bahrain life, from commerce and banking to education and entertainment – e-government, e-commerce, e-learning, being some of the more popular applications. It is easy to access the Internet in Bahrain, and its popularity has now grown beyond that of a plaything or luxury, to that of necessity.

There have been several attempts over the past decade to utilize and integrate the Internet into Bahrain educational system, beginning with the introduction of computer literacy courses in the nation's high school classrooms in the early 1990s. First emphasis was placed on courses examining the history of computers, its components, and keyboarding skills. Over the last decade, however, Bahrain's computer education curricula have evolved to include: computer operations, applications, and technology. During this decade, a dedicated network was also established to connect all the computer laboratories in all the nation's schools. To stay abreast of these changes, teachers attended in-service workshops to learn how to use computers on a personal level and in their teaching activities.

Currently, attempts are being made by the Directorate of Curricula at the Ministry of Education to teach some aspects of the schools' curriculum online, delivered via this network. To date, however, there has been no integrated attempt to convert courses for online delivery in a coherent manner. Nonetheless, efforts are being made by Bahrain's Directorate of Curricula to deploy an integrated infrastructure and processes dedicated to e-learning. In the meantime, ad hoc attempts are underway in some schools to deliver some didactic materials online to targeted groups of students. But these ad hoc attempts are piecemeal and exploratory, and will eventually be superceded by a more comprehensive system. However, certain technological – and more importantly cultural conditions – must be accessed and addressed before a coherent e-learning strategy in Bahrain's school system can be successfully introduced.

## **The University of Bahrain's Experience**

The University of Bahrain has enjoyed a head start over that of the nation's lower schools (primary, intermediate and secondary), which are under the control of Bahrain's Ministry of Education. It is only logical, therefore, that the University of Bahrain share its knowledge and leverage its expertise, possibly by providing the foundation for the inevitable deployment of e-learning across the country.

The University of Bahrain has a long history in computing sciences. In early 1980s, the University's department of computer sciences was established to offer a BSc degree in computing sciences, followed shortly thereafter by a department of computer engineering established under the umbrella of the College of Engineering. These two departments, along with the department of business information systems, were merged in 2000 to create the current College of Information Technology, responsible for teaching computer and information technology at the University. Nonetheless, other colleges are also seeking to integrate computer and information technology into their educational offerings. The department of educational technology at the College of Education for example, offers a BSc degree in Educational and Information Technology – a trend that is being repeated in all the University's colleges. To ensure that work is not duplicated, and to coordinate the various activities underway across all the colleges, the University of Bahrain's

Information Technology Center offers technical services to all departments at the university and is responsible for information technology access campus wide.

e-Learning at the University of Bahrain originally emerged in response to the introduction of the Internet and related computer applications. Like other universities around the world, especially those in Europe and North America, the Internet was first introduced at the University of Bahrain in early 1990s. Email was the most widely used Internet application at that time, but its use was restricted (only faculty and certain administrators specializing in computer and information technologies initially had access to the Internet). At that time, virtually no thought was paid to the didactic potential of the Internet or e-learning. With ever increasing availability of Internet access across the campus, coupled with exponential growth of computing capacity, by the mid to late 1990s e-learning emerged to become a realistic alternative for those faculty interested in teaching online. A decade later, however, e-learning still remains a mere option at the University, and efforts to deploy e-learning currently remain purely ad hoc. There is no systematic use of e-learning across the University to lead students to a certificate or degree. And while it is true that some departments use e-learning in selected course offerings, the fact is that no comprehensive e-learning system is in place to guide the future expansion of e-learning activities in a holistic, comprehensive manner. And while training workshops on how to use e-learning and develop e-learning materials have been offered, and software packages are made available to those wishing to engage in e-learning, no comprehensive or compelling strategy to guide universal e-learning deployment at the University is in place either. Nonetheless, several viability studies have been carried out, all of which cite the applicability of e-learning at the University. Similarly, several proposals to make e-learning available have been tabled. These activities reveal the University's clear and present interest in e-learning. In short, the University's administration is fully aware of the impact e-learning is having in terms of both need and potential, and are they are responding by seriously examining the implementation of a comprehensive e-learning strategy to coordinate and leverage its multiple efforts underway in all its departments and colleges. Clearly, such an effort to coordinate and harness these activities is a huge undertaking, and it will take a tremendous amount of strategic planning and effective leadership to make it happen.

To achieve this end, an e-learning center has been proposed to take responsibility for the comprehensive implementation of all e-learning activities across the University. Entire programs based on e-learning study are being planned. Similarly, other e-learning related activities and initiatives, such as live teleconferencing (which is currently hardly used at the University), will be taken into account in planning the scope of the larger implementation plan. Much good work has taken place at the University of Bahrain, albeit in a scattered, ad hoc manner. The objective here, therefore, is to examine what the University has accomplished to date, and to take the "parts that work well" and incorporate them into the larger plan.

Despite the ad hoc forays into e-learning at the University of Bahrain, it remains important to discuss all the issues and ramifications of implementing e-learning. Those charged with designing this strategic framework must take stock of what has happened, and determine how to use this technology to the University's (and Bahrain's) overall competitive advantage. Those charged with this project must explore and find answers to such questions as: Why this the University seeking to integrate e-learning? What kind of e-learning must be adopted and in what context? How is it going to be implemented? How do we measure student success in e-learning? How do we measure the impact e-learning will have on society? Clearly, the University of Bahrain, like other educational institutions throughout the world, is being forced to critically examine how they want to derive benefit from the Internet and e-learning.



Knowing exactly how staff, faculty, and students perceive e-learning and Web-based technologies, is an important first step. While technology itself is inhuman, how people use technology remains very human. The way in which education is offered via the Web clearly influences students' comprehension of study materials, as well as faculty members' use of electronic teaching materials. Faculty members, by benefit of experience and training, know that learning via the Web can take place, but that it will require different or modified pedagogical methods and strategies to make it happen effectively. Some e-learning applications can enhance student learning, whereas in other instances it might not yield such impressive results. And while faculty members may feel that e-learning will better meet students' needs and desires in terms of offering flexible educational opportunities anytime and anyplace, the fact remains that little is known about how students learn online. Simply put, using e-learning in some contexts might not be such a wise investment, as compared to similar courses offered in traditional face-to-face classroom settings.

Bahrain is a young country. Those under age 14 comprise nearly 30 percent of the nation's population (GE Source, World Guide, 2004). Faced with a large population of young people that need to be integrated into Bahrain's higher educational system over the coming years, the University of Bahrain must seriously examine e-learning as a solution to classroom overcrowding (for both blended learning situations or entire programs of study). Our ad hoc experiences tell us that certain courses can be taught successfully at a distance via e-learning modalities, and it is this "ad hoc experience" that we are seeking to measure and evaluate, to see what works and what does not.

Another question that needs to be answered is: What kind of e-learning should be developed in-house, outsourced, or purchased in a box? Answers to this question rely upon numerous factors, such as what kinds of technologies are currently available, faculty's familiarity with technology, physical access to the Internet, students' perceived and real needs, and the types, quality, and quantity of e-learning courses on offer. Once answers to these and other questions are found, it is anticipated that the University will likely adopt a hybrid approach to e-learning, one which includes developing individual courses used in blended learning situations, and/or entire programs of study offered solely online.

How should the University of Bahrain implement e-learning? Research shows that is it not prudent to adopt new e-learning strategies without first fully understanding the human/ cultural underpinnings (Hara and Kling, 2000) and physical/ technological infrastructure needed to support it (Fahy, 1999). Without first defining and answering such questions, roadblocks could arise, and e-learning could become a costly "bauble" that is nice to show off, but not worth much in terms of the value it adds to those working towards completing a course or degree. What sort of technological infrastructure is necessary? Is the technology scalable as demand increases? Are staff and faculty adequately prepared to support students learning online? Do they know how to use the technology themselves, as well as understand how students should ideally interact with it? Do students know how to interact with teachers, tutors, and fellow students online? Clearly, e-learning entails much more effort than simply putting textbooks online.

While it is important to impress upon University's of Bahrain's decision makers the importance to act upon e-learning, it is equally important to ensure that any efforts undertaken are made in such a manner that all contingencies are planned for in advance. It is not a case of hurry up, implement e-learning fast, and see what happens. It is ensuring we have the right framework in place, and ensuring all work is done right the first place.

When viewed from this perspective, Jamlan (2000) asserts that the University of Bahrain is not yet ready to adopt e-learning. Vital steps must first be taken to ensure that e-learning does not become costly “bauble.” According to Jamlan, the University’s technological infrastructure is currently not robust enough to support a comprehensive e-learning initiative. Similarly, faculty and support staff are not yet prepared for what many perceive as a radical change to their teaching methods and everyday work – they may either fear or simply lack the expertise to use such technology effectively. Without the necessary level of technological and human resources available, it will be difficult to sustain the collective teamwork necessary to overcome the obstacles typical to implementing a large-scale e-learning project. Once these underlying technological and human issues and concerns are addressed, however, the roll out of comprehensive e-learning initiative across all the colleges and departments of the University of Bahrain should go more smoothly.

Students are likewise an important factor in the mix of potential problems may arise. Close attention must be paid to students’ perceived expectations versus their actual learning needs. Like teachers, students tend to be creatures of habit and used to status quo teaching methods. While it is clear that changes must take place within Bahrain’s learning system, it must be at a pace that students are comfortable with. Students must therefore be strategically transitioned to e-learning and not simply dumped into the deep-end of the ocean and told to sink or swim. Students must be transitioned from the teacher-centric environment found in traditional classroom settings, to a student-centric model of e-learning where students are in charge of their own learning outcomes, and where teachers’ roles move from the “sage on the stage” to “proactive facilitators of learning.” Students must first be taught “how to learn.” They must be given access to the new tools (e-learning) and taught how to self-direct their learning – necessary elements in a student-centric environment, which is a typical outcome e-learning. This will require that students transform how they perceive their teachers’ role, and as such, plans must be in place to transition them towards a fundamentally different view of how they perceive their teachers’ work. But before we examine students’ perceptions at the University of Bahrain, we must first examine how teachers perceive their role. And this leads us to the core of this paper.

Gauging faculty members’ opinions towards e-learning is a crucial first step towards the successful adoption of e-learning. It is important to determine the level of faculty members’ interest in e-learning, and how they perceive e-learning as either a similar – or different – teaching strategy from what they are currently using. Teachers tend to have a certain comfort level and familiarity teaching with established facilities such as classrooms, blackboards, video and audio cassettes, printed materials, and basic computer applications (i.e., Microsoft Office). However, to move faculty and staff forward into e-learning, we must first determine how faculty members feel about and perceive e-learning. Such perceptions are typically either based on hands-on experience or second-hand knowledge. A clear understanding of teachers’ perceptions, therefore, will help construct a strategy to smoothly implement e-learning at the University. Determining perceptions will also help determine whether to continue using existing e-learning elements based on personal understanding and ad hoc use, or if a more generalized approach for e-learning deployment should occur. In sum, the results of this survey will help the University to develop a “how to deploy” policy. It is anticipated the findings of the survey (outlined below) will help guide decision makers at the University, and perhaps guide other educational institutions develop appropriate e-learning solutions for their particular goals and unique cultural contexts.

As mentioned, some faculty members are already using some kind of e-learning and this fact may, in itself, be a problem – or it might not be. The data gathered from this questionnaire will therefore help make sense of current levels of e-learning usage at the University, and give

administrators the basic data they need to define and develop future, comprehensive e-learning initiatives. To date, however, there have been no studies undertaken to determine the exact opinions held by the College of Education faculty members on e-learning.

## **Purpose**

It was felt that by undertaking a detailed study, hidden issues could be brought to light and addressed to ensure these issues do not impede the adoption of e-learning at the University of Bahrain's College of Education. By identifying both the obstacles and the positive attitudes held by faculty members, the results of this study could form the basis for a College-wide e-learning implementation plan. The results could also be used to build future efforts aimed at implementing e-learning not only in the College of Education, but in other Colleges throughout the University of Bahrain. It is anticipated that with the implementation of e-learning at the College of Education, the role of faculty members will be transformed from that of traditional dispensers of knowledge (sage on the stage), to learning facilitators (student-centric model). It is also anticipated that by involving staff in building a e-learning modality unique to University of Bahrain, this "collaborative approach" would greatly improve faculty opinion towards e-learning, and give rise to grassroots level confidence building as faculty work hands-on to integrate e-learning into their current course mix and teaching strategies.

## **The Question**

"What are the opinions of the faculty members at the college of education at the University of Bahrain towards introducing e-learning in their teaching strategy?"

## **Sample**

Using the stratified random sampling technique to include both male and female staff, 30 participants (61.2 percent) selected for this study were drawn from a total pool of 49 faculty members of the College of Education, University of Bahrain.

## **Method**

One instrument (a questionnaire) was used to determine faculty opinions towards introducing e-learning in their teaching strategies at the College of Education. The questionnaire consisted of 20 positively and negatively phrased statements to preclude any response set. Several items, used in other questionnaires from other studies (Fournier, 2002), were re-phrased for this study. The questionnaire was designed to be applicable to the study's population in terms of actual and perceived working conditions. A five point Likert scale was used consisting of: 1) strongly agree; 2) agree; 3) not sure; 4) disagree; and 5) strongly disagree.

The first draft of the questionnaire was sent to a panel of referees to determine its relevancy and validity. Minor changes were suggested by the referees. Upon re-examination of a second draft, consensus among the referees on the questionnaire's design and validity reached 88.3 percent, indicating a strong validation of the questions used in the questionnaire (Nitko, 1996). A correlation coefficient, calculated 0.90 on Alfa-Cronbach value, was used to test the internal reliability of the questionnaire, indicating strong reliability ( Nitko,1996, p. 69). The final questionnaire (see appendix) was delivered to the sample of the study via regular mail.

## Data Analysis

Descriptive statistics were calculated by using the Statistical Package for the Social Sciences (SPSS) software. Statistical findings for the opinion measures found in the questionnaire are reported in Table 1.

**Table 1. Mean and Standard Deviation**

Question	Statement	Mean	Standard Deviation
3	Saves time and efforts of both teachers and students	4.57	.50
15.	Technological infrastructure is crucial	4.43	.50
1.	Provides rich resources	4.40	.97
6.	Provides massive education for learners	4.37	.81
13.	Needs well prepared online materials	4.33	.48
12.	Needs sufficient training courses for implementation	4.30	.84
17.	Institutional recognition of e-learning	4.10	.80
19.	Establishing Evaluation mechanism	4.10	.88
14.	Sufficient ground work is required	4.07	.83
2.	Provides efficiency in teaching	4.03	1.38
18.	Establishing support services such as multimedia	4.03	.93
16.	Variant teaching strategies are required	3.97	.96
11.	Standardizes the content of course materials	3.93	1.11
10.	Minimizes costs of teaching and learning	3.83	.95
20.	Implementation should be gradual	3.73	1.11
8.	Difficulty in monitoring evaluation process	3.67	1.09
7.	Easy to monitor teaching and learning processes	3.43	1.17
9.	Results in decline in learners' achievement	2.73	1.17
5.	Causes fragmentation of work and loss of consistency in learning	2.53	1.25
4.	Reduces teamwork and collaboration between students	2.50	1.25

The mean data shown in Table 1 indicates there were no negative opinions towards using e-learning held by College of Education faculty members. Only a small portion (2.5 percent) of those surveyed tended to hold negative opinions toward the introduction of e-learning. The standard deviation also reveals the spread of the score distribution to be small for most of the items, indicated that faculty members tend to hold similar opinions towards the statements about e-learning. The data collected also indicated the extent to which survey respondents provided similar responses or ratings in answering the questions. When respondents provided the same or highly similar responses, the standard deviation of their responses was small, as is shown in the survey response in Table 1. In sum, the data collected revealed that the University's College of Education faculty generally held positive opinions towards introducing e-learning.

The statistical findings for the opinion measures used in the questionnaire are reported as "frequency" and "percentages." This analysis uses the frequency procedure to tabulate the counts and calculate the percentages. The total for the percentages derived were congregated into five groups: 1) strongly agree; 2) agree; 3) not sure; 4) disagree; and 5) strongly disagree. This analysis presents the statistical findings for measure of faculty opinions towards introducing e-learning in their teaching strategies.

## **Discussion**

Results of this investigation revealed “commonly held opinions” among faculty members on the introduction of e-learning at the College of Education. These results indicate that faculty members tend to view e-learning positively. They were of the opinion that e-learning will benefit teachers, students, and learning in general. Results of this study echo earlier studies by Kleiman (2000), Minton (2000), and Teather (2000). In spite of these positive findings, some reservations toward e-learning were nonetheless revealed in the data. Most faculty surveyed expressed concern that the introduction of e-learning would require increases in staff and student numbers to make e-learning economically viable.

Results of this study also revealed other widespread opinions on the introduction of e-learning:

- e-Learning provides rich resources to students and teachers
- e-Learning can make teaching more efficient
- e-Learning can save teachers and students time and effort
- e-Learning provides students greater access to educational opportunities

In summary, the results of this survey reinforce outcomes of similar studies conducted by Haugland and Wright (1997) and Hartly and Robertson (2001). While it remains to be seen if e-learning can live-up to faculty’s current expectations and perceptions, it does indicate they are open to the possibilities offered by e-learning.

Whether based on reality or wishful thinking, other commonly held perceptions/ opinions among College of Education faculty members are:

- It is easy to monitor teaching and learning processes via e-learning
- e-Learning can minimize costs
- e-Learning can help to standardized course contents and learning materials

Survey results also indicated that faculty members do not perceive that e-learning reduces teamwork and collaboration between students, or causes fragmentation of work and loss of consistency in learning, or results in a decline in learner achievement.

These finding are encouraging and support the University of Bahrain’s College of Education adoption of e-learning. It is anticipated that e-learning will be met with minimal resistance internally. Nonetheless, this survey also revealed key weaknesses. Faculty members are of the opinion that the monitoring and evaluation processes via e-learning might be difficult. Results also indicate that many requirements must be fulfilled before implementing e-learning at the University’s College of Education: teachers and students must have sufficient training; they must have access to well-prepared online course and teaching materials; sufficient groundwork must be laid to ensure that the adoption of e-learning is embraced by all involved. More importantly, the survey also reveals that the transition towards e-learning must be done gradually. In sum, results of this study reinforce the earlier findings of Davidson and Schofield (1997), McKenzie (1998), Mason (2001), Jamlan (2002), and Laurillard (2002).

## Conclusion

It is hoped that this study will contribute to a better understanding of faculty opinions towards introducing e-learning at the University of Bahrain's College of Education. Overall, the results indicate that faculty members tend to view e-learning positively. These findings are consistent with those found in the current literature. Current literature indicates that training is necessary before students and teachers are exposed to e-learning. A clear strategy is therefore required prior to implementing e-learning. The survey also reveals that gradual implementation is desirable, until faculty are comfortable using e-learning technology and convinced of its application as a viable teaching/ learning delivery strategy. Results of this study are anticipated to strengthen the status of e-learning at the University and other distance learning institutions in the region, and other areas of world. Some important outcomes of this study point to the need for further investigation. Many questions have yet to be answered. Does e-learning increase or decrease teamwork and collaboration among students? What is the best method to monitor student progress in specific learning contexts? Is standardized content better than customized content? And if so, in which contexts is standardized content better? What are students' opinions towards e-learning? Clearly, research on e-learning is as broad and potentially complex as the technology itself. Future research may take on a collaborative form, with the University of Bahrain working in partnership with other universities throughout the world. Similar cases examining whether to, and how to, implement e-learning are in the process of evaluation. Ad hoc experiences are still happening in e-learning, and their outcomes need to be fully analyzed and assessed for their effectiveness.

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# ***Open University and Distance Education Coordination: Strategies used to consolidate distance education at the National Autonomous University of Mexico***

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## **Abstract**

This case study describes three main strategies used from March 2002 to November 2003 at the Open University and Distance Education Coordination (CUAED) of the National Autonomous University of Mexico (UNAM) to consolidate distance education at the University. The author explains how, in just 18 months, these three main strategies enabled the UNAM to emerge as model of distance education for other public and private institutions in Latin America.

Distance education in Latin America, rather than being considered a second rate educational complement for traditional higher education, must be seen as a fundamental engine for restructuring other university systems, especially the public ones (Casas Armengol, 2002).

. . . the widespread use of new technologies in an organization does constitute a major cultural change. Furthermore, for such change to be successful, leadership of the highest quality is required (Bates, 2000).

**Keywords:** distance education; consolidation; project management; strategic planning

## **Introduction**

At 450 years old, the National Autonomous University of Mexico (UNAM) is currently Mexico's most important public higher education and research institution. UNAM is the foundation upon which Mexico's public higher education system has been developed. UNAM is a public, decentralized, national, and autonomous institution that carries out teaching, research, and cultural activities throughout Mexico. Through its 23 colleges and schools, UNAM currently offers 71 Bachelor, 29 specialization, 35 Masters, and 33 Doctoral degree programs. More than half of all the research carried out in Mexico takes place at UNAM's 39 research institutes and centers. Over 6,000 continuing education activities are also offered each year to the benefit of more than 130,000 students (Agenda Estadística 2001).

UNAM's Open University and Distance Education Coordination Center (CUAED) is responsible for strengthening continuing, open, and distance education across the University and throughout Mexico. CUAED aims to expand its continuing, open, and distance education programs both within and outside UNAM. For example, CUAED shares its open, distance and continuing education course programs and its "best practice guidelines" internally across UNAM's various schools and colleges. To serve broader societal needs throughout Mexico, CUAED also identifies educational and training needs of social, government, and business organizations.

To continue to reach its mandated objectives at a time of rapidly growing demand for continuing, open and distance education, CUAED found it needed to consolidate UNAM's diverse distance education activities. As such, CUAED developed the following three strategies, which were rolled out in lock-step over an 18 month period, starting in March 2002:

- Development of the Online University Program (*Programa Universidad en Línea*) and the PUEL System
- Creation of the Distance Education High Technology Center (CATED)
- A formal agreement was agreed upon that restructured the CUAED, and created UNAM's current Board of Distance Education

The objective of this article is to broadly outline the three strategies used by UNAM to consolidate its distance education activities. This paper examines the strategic activities that took place during the development and deployment phases, which lasted 18 months. It is felt that this case study may help other universities in developing countries define their own strategies in developing their own distance education programming.

### **Strategy 1. Online University Program (Programa Universidad en Línea) and the PUEL System**

The objective of the Online University Program (PUEL) is to help UNAM's many schools and colleges to develop their own online course materials for their numerous Bachelors, Masters and Doctorate programs, and for the over 6,000 continuing education courses offered each year by UNAM.

The use of new and emerging learning technologies, such as learning management systems (LMS), are necessary to meet the demands of increasing numbers of students studying to upgrade and enhance their knowledge and skills via distance education. However, the relatively slow adoption of Learning Management Systems – the cornerstone of many emerging distance education programs – often results, due to the high cost associated with purchasing and maintaining the software (Depow 2003). Because of the high costs associated with proprietary LMS and other technological platforms used for managing online courses (e.g., *WebCT*), CUAED developed its own "PUEL" system. In sum, PUEL is a home-grown platform used by UNAM to develop and administrate its online course offerings.

LMS are intended to address a range of pedagogical and technical issues such as learning and design theory, hardware and software purchases, student support services, student assessment, student interaction, instructional strategies, security and firewalls, and staffing. The goal of this type of platform is to provide an information system that can effectively handle students, teachers, course administration, and course materials in an online environment (Bidarra and Dias,

2003). Many higher education institutions are currently using proprietary LMS products such as *WebCT* and *BlackBoard*. Nonetheless these proprietary solutions are often cost-prohibitive for many institutions, especially those in developing countries (Depow, 2003). In other words, many publically funded higher-education institutions – particularly those in developing countries – cannot afford the development or acquisition of a proprietary LMS. An alternative solution, however, can be found in the wide and rapidly emerging range of non-proprietary, open source and free software LMS packages (Depow, 2003). PUEL's main objective, therefore, is to offer UNAM's Schools and Research Centers and other public institutions the resources they need to generate their own online courses and learning materials. Launched on June 16, 2003, PUEL is offered as an open source LMS through a free licensing agreement (see [www.puel.unam.mx](http://www.puel.unam.mx) for details on this system). By November 30, 2003, over 560 licenses have been downloaded by institutions in 28 different countries (e.g., Japan, Mozambique, United States, and Canada, along with several countries throughout Latin American and Europe).

PUEL is divided into three modules: users' administration, course administration, and statistics. PUEL generates and stores activities in individual student binders, which allows students to refer to previously performed activities and receive continuous feedback from their tutors. Students can also edit and store their activities in their personal online binder. PUEL generates access reports for users which are available through webpage interfaces; it also generates statistics for each session in each course and manages different levels of security (i.e., administrator, editor, and user levels).

**Figure 1: PUEL website ([www.puel.unam.mx](http://www.puel.unam.mx))**



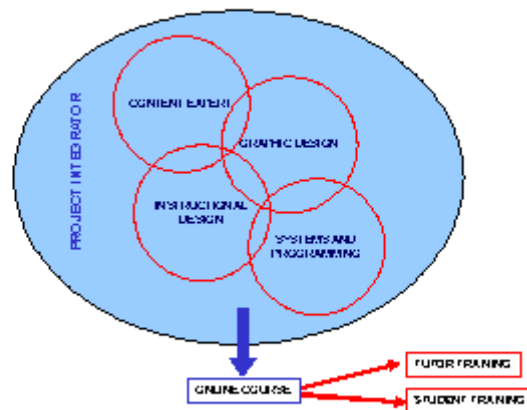
Institutions interested in starting an online program must factor in the costs of infrastructure (hardware), course contents, a technological platform or LMS, and appropriately trained staff (Uys, 2003). According to Uys: "Many aspects of the socio-economic and technological environment that are often taken for granted, must be explicitly addressed when introducing instructional technologies for open learning in developing settings. These include, among other things, participants' unfamiliarity with new instructional technologies, inadequate telecommunications infrastructure, unreliable power supply, competition for limited educational sector resources, and the need to provide basic educational facilities" (Uys, 2003).

After developing the PUEL System, the next step was to generate a scheme that would enable UNAM's numerous schools, colleges, and centers to develop their own online courses and course materials based on existing face-to-face course offerings. The basic idea here was not to reinvent the wheel, but instead to re-vamp the wheel so it could meet current and future educational demands. Because UNAM's various schools, colleges, and research centers have the necessary infrastructure and course contents, focused was therefore placed on developing and offering the

PUEL LMS. To accomplish this task, a multi-disciplinary working group called "Núcleo PUEL" was assembled to bring the necessary expertise needed to coordinate and man the project (Berruecos, Gil, Morales and Bosco, 2003). Núcleo PUEL is comprised of a project integrator, a content expert, an instructional designer, a graphic designer, and a systems administrator. The project integrator is the "decision maker" who often coordinated several projects simultaneously. The content expert worked on specific projects, while the remaining experts worked on different projects, depending on the need for their particular expertise at various points in each project cycle/ lifespan.

In other words, the experts that comprised Núcleo PUEL effectively eliminated the need for "everybody to know everything." For example, the content expert does not need to learn graphic design and programming required for developing online course material. This tactic was followed because it was proven at other institutions that multi-disciplinary groups are very effective. "each academic is working on some aspect of online conversion or course and program enhancement. Since academics have different ideas, backgrounds and levels of expertise, support staff (designers, editors, visual designers, etc.) are organized and trained to respond in a number of ways in each course team. This leads to interesting implications for human resource management. As the various learning platforms and their associated human resource needs evolve, there is a continual emergence of new position types, and levels within these types. Each learning system requires a unique blend of technical, design and pedagogical expertise, and once each position is established, the needs evolve rather quickly" (Davis, 2001). The PUEL group, therefore, ensures that only the most competent experts will develop high quality contents, thereby removing the task of course development from less skilled and typically less computer-literate staff. "While some teachers develop and use advanced Web-enhanced learning materials effortlessly, others struggle to acquire basic computer literacy skills. Where previously teaching staff were divided in their ability to use word-processors and spreadsheets, today's educators are divided by their ability to create and update their online course materials" (Depow, 2003). Over time, the course will be tutored by other colleagues, if necessary.

**Figure 2.** PUEL group ("Núcleo PUEL")



(Berruecos, Gil, Morales, and Bosco, 2003).

To consolidate the PUEL groups, a training strategy was identified and developed. To this end, CUAED now offers four online courses and "PUEL manuals" which guide users in installing, operating, administrating, planning, and designing online courses using the PUEL system. In October 2003, CUAED began delivering a free-of-cost, face-to-face, week long workshops to

UNAM schools and research centers seeking to implement their own PUEL group. In order to participate in the PUEL workshop (which Schools and Research Centers use as a template for designing and installing their first course online) CUAED demands that each prospective PUEL group member meet certain baseline performance criteria. Adherence to this selection criteria, ensures that those charged with developing the online learning materials and courses will be able to do so after the end of the week long workshop. In other words, by the end of the workshop, each new PUEL group had combined theory and practice to develop (at minimum) the first topic of an online course, which they will continue working on at their own School or Research Center. CUAED also offers ongoing assistance to these groups if needed.

## Strategy 2. Distance Education High Technology Center

In June 2002, the State of Tlaxcala offered UNAM a 9,000 square meter textile factory, built in 1884, for use as its Distance Education High Technology Center or in Spanish, *Centro de Alta Tecnología de Educación a Distancia* (CATED). CUAED stipulated that the CATED project include four academic areas, and defined an implementation strategy to be rolled out in five stages. The project included the rebuilding the factory, which entailed combining the original architectural elements of the old textile factory with modern installations and high technology:

- Distance Education High Technology Center (Stage 1 and 2)
- Convention Center (Stage 3)
- Multidisciplinary Research Projects (Stage 4)
- Cultural Center (Stage 5)

**Figure 3.** Stages of development of the Distance Education High Technology Center (CUAED)



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In March 2003, the Dean of the University (Rector) and the Governor of Tlaxcala signed a formal agreement, and by August 2003, the first stage of the CATED project was finished. CATED's first stage included building video-conferencing and computing rooms, training rooms, digital library, multimedia library, servers, central telecommunications infrastructure, Internet2, production labs, and a coffee shop. The second stage will include building television studios, pre- and post-production centers, and production labs. CATED's main objective is to develop the pool of human and technical resources necessary to design, develop, and implement distance education (online courses, television, video, video conferencing, multimedia). "Rather than overload the

existing universities, this new institution would possess a technical, methodological, and administrative organization appropriate to distance teaching” (Garcia Aretio, 2001).

CATED’s mission is to:

- Promote the use of information technology for distance education
- Promote and provide high technology services for the development of distance education to benefit academic institutions and UNAM students and alumni, as well as for other Mexican higher education institutions and international institutions (Berruecos and Berruecos, July 2002).

The objectives of CATED are to:

- Develop pedagogical, didactic, and technical models to offer "best practices" in the higher educational processes
- Provide training and support for research related to distance education and using technology for higher educational purposes
- Develop multidisciplinary projects
- Develop distance education courses with high technology: computing laboratories, television and video production studios, videoconferencing rooms, digital libraries, and development of websites
- Develop Internet and Internet2 didactic support materials for students and tutors
- Offer continuing courses for UNAM and other institutions’ professionals, students, and graduates
- Publish research results on distance education and on the use of technology for higher educational purposes through different media
- Develop organized metadata, thesaurus, digital library systems, electronic publications, and websites
- Train the pool of human resources necessary in the use of new technologies for distance education
- Produce Internet, multimedia, television and video contents (Berruecos and Berruecos, March 2003)

CATED will offer courses on distance education development; provide consulting services on e-learning; develop learning objects; and provide access to computing laboratories, videoconferencing rooms, television and video production studios, and digital libraries (Berruecos and Berruecos, April 2003). CATED’s Academic Project was divided into four areas:

- Academic, technical, and technological training for distance education development (i.e., learning-teaching processes, motivation, social learning, media and administration)

- Content development for distance education (i.e., Bachelor degree programs, continuing education, and other academic projects such as learning objects and learning object repositories)
- Research on distance education (i.e., learning-teaching processes, use of media and technology, user motivation, distance education project administration, tutors training, best practices)
- Multidisciplinary projects (evaluated and approved by the University's Board of Distance Education). As an example, CUAED-CATED and the Anthropology Research Institute are currently developing the "University's Pre-Hispanic Ceramic Virtual Museum" and the "Mexican Anthropology Site."

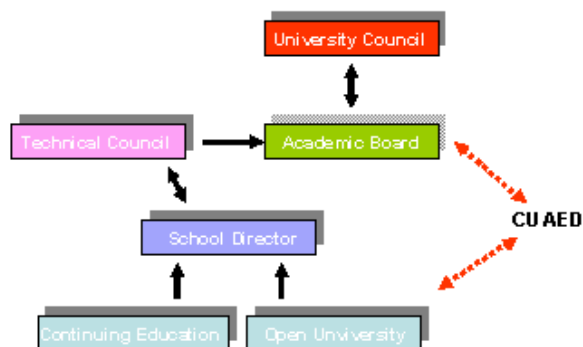
CATED and CUAED will also share responsibility for the development of other future academic projects, which will subsequently be evaluated by the Board of Distance Education.

### Strategy 3. Restructuring of the CUAED and the Creation of UNAM'S Board of Distance Education

Now 30 years old, UNAM's Open University currently offers through its nine schools, 17 Bachelor degree programs, three specialization and one technical programs. Each school's Open University coordinator reports directly to the director of the school where the program is offered – e.g., six open Bachelor degree programs (Philosophy, History, Geography, English Literature, Education, Spanish and Latin-American Literature) of the School of Philosophy and Literature are coordinated by only one person.

Prior to September 2003, an Academic Board responsible for overseeing the operation of UNAM's Open University existed. The purpose of the old Academic Board was to approve each new Open University program before sending them to the University's Council (*Consejo Universitario*), the most important collegiate authority responsible for approving all academic programs at UNAM. However, CUAED typically only held one Academic Board meeting per year; and UNAM's Open University norms, rules and regulations had not been updated for over 30 years.

Figure 4. UNAM's Old Open University and Continuing Education Structure, prior to September 2003

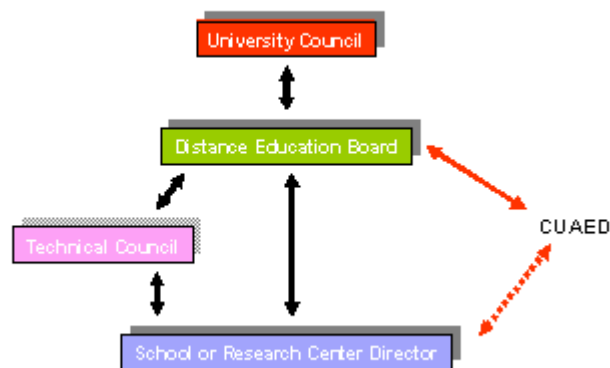


UNAM has 40 Continuing Education Centers, where programs are developed and coordinated by each school, often receiving previous approval of the school's collective authority (comprised of representatives from student, teacher and administrative officials). This collective authority is called the Technical Council (*Consejo Técnico*) of the School. As such, prior to 2003, no rules or regulations exist to guide the development and delivery of diploma programs, because each school was essentially free to decide what to offer and how to deliver it. Similarly, no viable norms, rules or regulations existed for distance education either. Indeed, a handful of schools throughout the University began developing and delivering distance programs within their own means, and these efforts were also largely piecemeal and unregulated.

In 2003, however, CUAED negotiated a proposal to restructure its functions and responsibilities. This proposal resulted in the creation of UNAM's current Board of Distance Education on September 19, 2003, when a formal agreement was signed by the Dean (Rector) of UNAM. The scope of this new Board of Distance Education is as follows:

- Open University and continuing education programs are the responsibility of each School and their Technical Councils
- The Board of Distance Education is responsible for evaluating and updating existing rules and regulations, and developing new distance education regulations, rules, and procedures with the overarching goal of guaranteeing academic and technical quality
- The Board of Distance Education is in charge of evaluating all distance education programs (Bachelors, diplomas, specializations, and graduate programs) developed by any academic institution of the UNAM
- CUAED will coordinate the Board of Distance Education
- CUAED is responsible for registering all UNAM distance and continuing education programs in UNAM's Distance and Continuing Education Catalogue

**Figure 5.** UNAM's Distance Education after September 2003



Like other University course offerings, the pedagogical restructuring required in distance education is deep and extensive. Some experts such as Collis (1996, p. xxii) feel that the "re-



engineering” of distance education is most appropriate. As such, it could be said that a new era of distance education is now visible on the horizon, one in which distance education will develop into an extraordinarily open, flexible, and variable form of teaching and learning that can be adapted and adjusted to meet the learning requirements of students based on demographic variables such as age, social background, vocational orientation, etc. As such, a clear student-oriented form of studies must be created (Peter, 2000).

## **Conclusion**

Tremendous inroads and advancements have been made regarding distance education offered by UNAM over the past 18 months. Via the three strategies mentioned above, the University now provides an exemplar for other public universities to follow. Moreover, within these three strategies, three important key premises were followed during the process.

### ***1. "Do First"***

Many institutions begin the transition to distance education by first trying to establish norms, rules, and regulations as the springboard upon which to start developing their programs. At UNAM, the strategy used was completely opposite: CUAED first began developing its distance education programs and establishing its Distance Education High Technology Center, and these projects in turn generated "internal pressure" which drove the negotiation processes with the University authorities, and ultimately resulted in the creation of the current Board of Distance Education whose mandate is to provide quality guidelines on various educational offerings. This new Board of Distance Education is now responsible for developing all regulatory norms, rules, and regulations for the University's distance education offerings.

### ***2. Stages***

The Distance Education High Technology Center project was rolled out in stages. This tactic divided the total cost of the project into five phases. As a result, it was much easier to convince financial authorities to invest in a project that was defined step-by-step, than requesting a total lump-sum investment at the outset.

### ***3. Delegation***

CUAED is no longer responsible for developing all UNAM's distance education programs. Given the enormous scope and reach of UNAM's 71 Bachelor degree programs and 6,000 plus continuing education programs, it simply would have been impossible for CUAED to develop numerous programs in an efficient and cost effective manner. With the development of the PUEL system, however, CUAED now provides the necessary resources (after basic training is complete), which it then delegates to each School and Research Center. CUAED also coordinates the validation and registration of each distance learning program through the Board of Distance Education; it does not administer these programs, as that is the responsibility of each school. In sum, CUAED is responsible for training individual schools' PUEL groups on how to develop their own online programs. Through its Distance Education High Technology Center, CUAED trains technical and academic personnel the "how to" and "best practices" of developing distance education courses, and then when the courses are ready to be reviewed and approved by the Board of Distance Education, CUAED handles that process too. In simple terms, CUAED enables distance education – it does not dictate it.

Keegan (1996) stated that "governments in both developed and developing countries no longer have the money to build and maintain buildings for 100,000 students a year." In today's world, distance education has emerged to become viable option for many nations and "the growing strategic importance of higher education, coupled with the need to reorganize and radically transform Latin America's university system, is essential to help Latin America catch up to other countries around the world" (Casas Armengol, 2002). Within the context of a globalizing world economy, CUAED will enable Latin-American countries to develop their own capacity for developing distance education programming (.e.g., Spanish contents will be available for Latin America's Spanish speaking population) to meet the growing educational needs of their people. This reinforces the statement by Bates (2001) who said: "help must be provided in a way that reduces rather than increases dependency, by enabling local institutions to develop their own capacity for online teaching adapted to the needs of their own society."

The National Autonomous University of Mexico is now a reference model which other institutions can use as a template or exemplar as they transition to distance education, especially for other Latin-American educational institutions. Through CUAED's strategies and results, it has been proven that even when resources are scarce, there are strategies that can help higher education institutions enter into the world of distance education in a cost effective and efficient manner.

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from: <http://www.irrodl.org/content/v4.2/uys.html>



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## ***A Comparative Study of Dropout Rates and Causes for Two Different Distance Education Courses***

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### **Abstract**

This paper reports the results of a survey conducted to examine the root causes leading to student dropout at a Greek distance education university. Data was gathered from two different courses – an undergraduate course leading to a Bachelors degree in Informatics (characterized by high dropout rates), and a postgraduate course leading to a Masters degree in education (characterized by low dropout rates). A comparative analysis of these two different courses revealed important similarities in dropout percentages and the reasons cited by students for dropping out. Our analysis also revealed important differences as well. This paper presents the results of a survey designed to investigate the relationship between dropout with intrinsic (student-related) factors such as sickness, work/ school conflict etc., and extrinsic (institutional-related) factors such as study methods and materials, educational approach, and tutor influence.

**Keywords:** university level education; distance learning; dropout rates; dropout causes

### **Introduction**

The establishment of open universities around the world aim to address the educational and re-educational needs of adult learners and workforce by providing a high level of studies (Evans and Lockwood, 1994, Evans and Nation, 1996). Open universities typically develop educational activities underpinned by an educational philosophy fundamentally different from those held by conventional educational systems. The main aspect of this philosophy is to promote “life long education” and to provide adults with “a second educational chance” (Keegan, 1993). The educational method used in an open university system is most typically “distance learning.”

High student dropout rates have been reported in educational institutions using open and distance learning methods (Cardon and Christensen, 1998). Students dropout of their studies for a numerous reasons and factors (Eisenberg and Dowsett, 1990) ranging from academic, to non-academic, to other factors (Jones and Watson, 1990). Factors include the degree of difficulty of courses and subjects selected by students; miscalculation of time students need to study (Sponder 1990); health problems (Kaye and Rumble, 1991); and family problems (Allen, 1994), to name a few.

Dropout rates reported by open and distance learning (ODL) institutions are typically higher than those reported by conventional universities. Within ODL educational systems, dropout rates also vary depending on the educational system adopted by each institution and selected subjects of study (Narasimharao, 1999). In Europe, dropout rates in distance education programs typically range from 20 percent to 30 percent (Rumble, 1992) or even higher in Northern America (Schlosser and Anderson, 1994). Asian countries have recorded rates as high as 50 percent (Shin and Kim, 1999; Narasimharao, 1999). A number of models, such as Tinto's model of student retention, (Bernard and Amundsen, 1989), have been developed to help explain the dropout phenomenon in higher education.

## **Purpose**

The purpose of this study is to investigate the factors and root causes leading student dropout. It is felt that our research will enable staff working in ODL institutions to "identify" high and at risk students and student groups (e.g., individual students or entire student groups more likely to dropout than other students/ students groups). It is felt that our research will enable student support staff at the Hellenic Open University, as well as staff at other universities offering open and distance learning, to deal with high-risk groups more efficiently and effectively, thereby minimizing student dropout.

The research questions examined in this paper are:

- To what extent is student dropout due to intrinsic (related to the student) factors and to what extent is it due to extrinsic (non-student) factors? (e.g., study methods and materials)
- To what extent does actively taking part in optional components of the educational process lead students to interrupt their studies?
- To what extent do the educational materials and/ or tutors lead students to withdraw from their studies?
- Are there any similarities/ differences in dropout rates/ causes on different courses? And at what level would these be?

## **Objective**

The objective of this study is to examine the "reasons why" students enrolled in two different distance education programs of study opted to dropout.

## **Sample**

The sample was drawn from students enrolled in two academic programs offered by the Hellenic Open University: 1) a two-year Bachelors degree in Informatics program; and 2) a two-year Masters degree in Education. Students enrolled in the Bachelors of Informatics program was comprised of undergraduate students (i.e., high school graduates). Students enrolled in the Masters degree in Education was comprised of graduate students (e.g., Bachelor's prepared teachers and teacher-trainees).

The Bachelors degree in Informatics and the Masters degree in Education were selected to ensure that both undergraduate and graduate students, studying both technologies and the social sciences, were represented in our sample. These two academic programs are also the most popular offered by the Hellenic Open University, and therefore are of high importance to the University.

## **Overview**

A broad overview of the Hellenic Open University (HOU) is presented here to inform readers about the institution's operational practices. The HOU uses a modular system, with modules of one academic year comprising its basic functioning unit. Each module is comprised of three or four conventional university-level subjects, depending on the subjects' degree of difficulty. Similar educational set-ups and programs are offered by other open universities (Lupo and Erlich, 2001), so HOU's approach to distance education is not new or novel. HOU's educational material is comprised mainly of printed material supplemented with audio-visual and/ or electronic material. Each HOU tutor oversees the learning progress of approximately 30 students. To earn an undergraduate degree, undergraduate students must successfully complete 12 modules (four academic years); to earn a postgraduate degree, graduate students are required to successfully complete four modules (two academic years).

For each module, students must complete four to six written assignments (30 percent of the final grade) and to sit for a final exam (70 percent of the module's final grade). HOU students enrolled in these courses have the option of participating in four to six group-counseling (face-to-face) meetings that take place at their residence or at a convenient location nearby.

## **Findings and Discussion**

In 2000 – 2001, 510 students were enrolled in the “Informatics” course. The following academic year, 2001-2002, student enrollment in this course increased to 720. During their first year of studies, students enrolled in the Informatics degree program have the choice of registering two of three modules: a.) Introduction to Informatics (INF10); b.) Introduction to Software Engineering (INF11); and c.) Mathematics I (INF12). The student handbook, however, strongly advises students to include INF10 in their module selection. As a result, 97.7 percent of the 2000 – 2001 students ( $n = 498$ ), and 99.7 percent of the 2001 – 2002 students ( $n = 718$ ) specifically elected this module – INF10.

In the 1999 – 2000 academic year, the total number of students enrolled in “Studies in Education” was 1,220. This course consists of the following modules: a.) Open and Distance Learning Education (SED01) ( $n = 758 / 62.13$  percent of the total students enrolled); b.) Adult Education (SED02) ( $n = 105 / 8.61$  percent); c.) The Child's Development in the Social Environment (SED03) ( $n = 196 / 16.07$  percent); d.) Administration of Educational Units (SED04) ( $n = 113 / 9.26$  percent); and e.) Educational Research in Action (SED05) ( $n = 48 / 3.93$  percent).

Students have the option of choosing any of the aforementioned module combinations, so long as they do not exceed the module limit per academic year. Table 1 below illustrates the total number of students enrolled in both the Bachelors of Informatics and the Masters of Education degree programs. Please note the low percentage of female students enrolled in the Informatics courses.

**Table 1.** Total number of students enrolled in Bachelors of Informatics and Masters in Education degree programs

	Informatics		Studies in Education	
	N	%	N	%
Male	873	71.0	577	47.3
Female	357	29.0	643	52.7
Total	1,230	100.0	1,220	100.0

## Method

A descriptive research design was used for this survey; three different sources were used for data collection. The first source of data came from HOU’s student registry records, which contain demographic data routinely collected during registration (e.g., student’s age, sex, previous education, family status, etc.) along with the number and types of courses selected by each student for each study model. The second source of data came from tutors’ class records (e.g., number of students who attended the optional face-to-face meetings and grades recorded on students’ assignments). The majority of tutors responded to the survey, therefore we were able to gather relevant data on 89 percent of the students enrolled in the two courses under study. This percentage guarantees statistical validity of results (Anastasi and Urbina, 1997). The third source of data came from short structured interviews, which were conducted with (most) student dropouts at the end of each term. These structured interviews were designed to gather qualitative information about the “reasons” why students’ elected to dropout of their studies. During these short interviews, students were also asked their opinions about their tutors’ performance, course material used, and about the HOU in general.

Data collected from the first and second sources came directly from HOU’s Student Registry records and tutors’ class records. Data from the third source came from answers collected from structured interviews; these interviews were typically two to five minutes in duration. Student dropouts were asked a set of structured open-ended questions in a prearranged order. They were asked their opinions on four major issues related to their studies: a.) their reason(s) for dropping out of their studies; b.) their opinion about their tutors’ performance; c.) their opinion about the educational materials used; and d.) their opinion about HOU in general. Upon completion of each interview, each answer was transcribed, and subjected to content analysis in order to categorize students’ responses. All data was analyzed using multivariate methods (Anastasi and Urbina, 1997) as well as correlation analysis associating the factors that were examined. The main statistical tests used to check the correlation between variables were x2-test and Spearman rank order correlation coefficient. The resulting correlations and differences between variables were assumed statistically significant (Anastasi and Urbina, 1997; Siegel and Castellan, 1988).

Of 173 students who dropped out of “Studies in Education,” 108 (62.4 percent) participated in this study. For a more detailed study on this group’s profile, please refer to Vergidis and Panagiotakopoulos (2002). Of the 349 students who dropped out of “Informatics,” almost the entire dropout student population (97 percent) was interviewed. For a detailed study regarding this group’s profile, please refer to Xenos, Pierrakeas, and Pintelas (2002). The remaining student



dropouts had moved residence, could not be located, or had refused to participate and are thus not included in the data.

### **Student Dropout Rates**

Of the 1,230 undergraduate students enrolled in the “Informatics” course, 349 dropped out (28.4 percent). Of the 349 undergraduate students dropouts, 338 (96.8 percent) took part in our study. Of the 1,220 graduate students enrolled in the course “Studies in Education,” 173 dropped out (14.2 percent). Of the 173 graduate students who had dropped this course, 108 (62.4 percent) took part in our study.

The above dropout rates include those students enrolled in at least one module, but failed to deliver one project (e.g., a written assignment), had elected not to re-register in HOU, and indicated they would not re-enroll in HOU at a future date. Dropout rates also included students enrolled in multiple courses, who had successfully completed some but not all of their assignments, and had indicated they would not re-enroll in HOU at a future date.

The dropout rates described above also include those students who did not complete some or all of their assignments, but indicated they would continue their studies at HOU, by repeating these modules the following year. Along with the above, the data in Table 2 also include those students who successfully completed all their assignments in all the selected modules.

**Table 2.** Dropout and completion rates of students enrolled in Informatics and Studies in Education.

	Informatics		Studies in Education	
	N	%	N	%
Dropout	349	28.4	173	14.2
Continue	881	71.6	1,047	85.8
Total	1,230	100.0	1,220	100.0

### ***Student Dropouts in Relation to Student Profiles***

According to the existing legal framework for the HOU, individuals aged 23-45 have priority to enroll. Students who dropped out from “Studies in Education” mainly belong to the 35-39 age group (30 percent of the total) and to the 30-34 age group (27 percent of the total) as shown in Table 3. Fifty-seven percent of those students who dropped out are between age 30-39, and are, therefore, at their most productive age.

**Table 3.** Student Dropout Rates by Age Group

Age	Informatics		Studies in Education	
	N	%	N	%
<30	119	35.2	21	19.4
30-34	128	37.9	29	26.8
35-39	66	19.5	33	30.6
>39	25	7.4	25	23.2
Total	338	100.0	108	100.0

It is worth noting that in both courses surveyed, 57.4 percent of students dropouts are from the 30-39 age group – typically a period of one’s life that is quite demanding in terms of balancing occupational obligations and family responsibilities. Differences have also been observed among other age groups as well. The percentage of dropouts is higher with younger students (<30) enrolled in the undergraduate course “Informatics” as opposed to being quite low (7.9 percent) with older students (>39). One likely explanation for this phenomena is that that younger students (<30) are typically studying for the first time, and hence have little or no previous experience of studying at the university level. As such, these students are more likely to underestimate the effort and workload required of university level studies. Moreover, many of these students do not possess the background knowledge to cope with the demands of their studies. Bearing in mind these factors, along with occupational obligations and family responsibilities, withdrawal from studies is understandable for this age group.

The data collected on students who dropped out of the postgraduate course, “Studies in Education,” revealed that older students (>39) tended to drop out of their studies. Whereas younger students (<35), having recently gained experience in university level studies, are more familiar with the rigors of study, and therefore tended to be more conscientious, try harder, and study “smarter.” Older students (>35), however, are typically more entrenched in their current professional path, which makes it easier for them to dropout if they feel that their education is interfering with their professional responsibilities.

**Table 4.** Student Dropout Rates and Gender

	Informatics		Studies in Education	
	N	%	N	%
Male	238	70.4	52	48.1
Female	100	29.6	56	51.9
Total	338	100.0	108	100.0

Table 4 shows the distribution of student dropout rates by gender. For “Studies in Education,” females consist of 52.7 percent of the sample, and the 51.9 percent of the dropouts ( $\chi^2=0.8$ , DF=1, NS). Similar results were found for “Informatics” students, in which females consist of the 29.0 percent of the sample, and the 29.69 percent of the dropouts ( $\chi^2=0.4$ , DF=1, NS). Considering that differences for both programs of studies are not statistically significant, the correlation between dropouts and gender shows that the overall dropout rates are similar in men and women.

**Table 5.** Working Status of Students who Dropout

	Informatics		Studies in Education	
	N	%	N	%
Employed	320	94.7	107	99.1
Unemployed	18	5.3	1	0.9
Total	338	100.0	108	100.0

Table 5 shows that all students who had dropped out – with the exception of one – were presently employed at the time of this study. Only one student (female) stated that she was unemployed. Bearing in mind that the percentage of unemployed students within the total number of students attending the “Studies in Education” course is 2.1 percent, we concluded that the dropout rates are similar (not statistically significant) in employed and unemployed students.

Similar conclusions can be made regarding the relationship between student dropouts and students’ working status within the “Informatics” course, where 5.3 percent of student dropouts claimed they were unemployed, while the overall percentage of unemployed students was 4.1 percent. Considering the derived differences for both programs of study are not statistically significant, the correlation between student dropouts and students’ working status shows that the overall dropout rates are similar (not statistically significant) between employed and unemployed students.

**Table 6.** School Teachers and Non-School Teachers who Dropped Out

	Studies in Education	
	N	%
Teachers	83	77.6
Non teachers	24	22.4
Total	107	100.0

It is not surprising that graduate students enrolled in “Studies in Education,” would mainly comprise of Bachelor’s prepared school-teachers. Referring to Table 6, we can draw the

conclusion that of the high percentage of student dropouts (22.4 percent as compared to 14.2 percent, which is the mean average), roughly half of those who elect to dropout are not teachers. Of those students who are employed, school-teacher dropouts comprised a much lower percentage compared to those dropouts employed in other professions or jobs. This phenomena may be explained by that fact that school-teachers enrolled in this courses tend to be more familiar with studying and essay writing, they tend to have more free time compared to other working students, they are more motivated because of their professional standing, and/ or because they are more familiar with pedagogy given their hands-on experience in the classroom.

**Table 7.** Student Dropout Rates versus Current Professions

	Informatics	
	N	%
Related to informatics	188	58.8
Not related to informatics	132	41.2
Total	320	100.0

Table 7 illustrates the correlation between dropouts and students' working involvement in professional activities related to Informatics. The high percentage (41.2 percent) of dropout students whose professional activity/ work was not related to Informatics indicates the statistically significant correlation between student dropouts and involvement of students in activities directly or indirectly related to Informatics ( $R=0.428$ ,  $p<0.0001$ ). Obviously a profession indirectly or directly related to Informatics (e.g., being an avid computer user, programmer, or technician) provides these students with a significant amount of tacit background knowledge, which typically augments their learning. Furthermore, they can put their academic knowledge into action in their daily working life (e.g., interacting on a professional level with their work colleagues and peers).

### ***Student Dropout Rates in Relation to Educational Procedures Used***

The purpose was to determine the degree of dropout students' participation in the educational processes of the HOU, to figure out at what stage students tended to dropout of their studies. As we can see in Table 8, 51.8 percent of our sample had failed to deliver any assignment, and 27.8 percent had completed only one assignment. This finding reveals that 80 percent of dropout students had quit studying from the outset, a finding which supports results from previous research (Holmberg, 1995). Sixteen percent of the sample, however, dropped out after having completed two written assignments, while some discontinued prior to final exams, although they had completed all their written assignments.

**Table 8.** Dropout Rates versus Total Number of Written Assignments Completed

Number of handed-in written assignments	Informatics		Studies in Education	
	N	%	N	%
0	94	27.8	56	51.8
1	155	45.8	30	27.8
2	52	15.4	18	16.7
3	29	8.6	3	2.8
4	8	2.4	1	0.9
Total	338	100.0	108	100

The Informatics course yields similar results, as shown in Table 8, which shows that 73.6 percent of the students who had elected to dropout had only handed-in none or only one written assignment.

These results suggest that that having handed in half of the required written assignments makes it harder for most students to dropout. Thus, 3.0 percent of such students dropped out from the Informatics course, and only 0.3 percent dropped out from the Studies in Education course (both percentages are drawn from the overall number of students).

It can be concluded, therefore, that for students enrolled in Studies in Education, the majority of dropouts belonged to the 30 – 39 age group, and most are employed. In addition, gender does not appear to play in role in student dropout of these two courses, as revealed in our data which shows no significant statistical difference. For student dropouts who are employed, school-teachers represented a much lower percentage in comparison to the students working in other professions or jobs. Finally, most student dropouts take place at or near the beginning of the module (up to the point of submission of the second written assignment).

For students enrolled in “Informatics” modules, we can conclude that the vast majority of student dropouts belong to the 30-39 age group, almost all are employed, and gender does not appear to be a factor in student dropout. Similar to students enrolled in the Studies in Education modules, those enrolled in the Informatics modules tended to dropout at the start of their studies, at a period prior to handing in their second written assignment. Interesting comparisons can also be made between Informatics student dropout rates and Studies in Education dropout rates. The percentage of student dropouts below age of 30, and the percentage of those whose profession is not associated with Informatics, are double as compared to the analogous numbers drawn from the Studies in Education course.

### **Causes of Student Dropout**

No entry exams are required in order to register in the Hellenic Open University. To gain entry, all that is required is that prospective students complete an application form, after which a draw may take place in instances where demand is high versus actual spaces available. Courses are not

free, as is the case Greece's conventional universities. Students must also pay part of their student fees and tuition in advance. Therefore, it could be safely assumed that students enrolled in HOU have programmed their studies prior to enrolling and have, indeed, chosen their subject of preference.

From the above, it can be safely assumed that the main cause for dropping out would stem from unexpected/ emergency situations encountered by these students. Another root cause leading to dropout, however, seems to stem from students' initial understanding in terms of the underestimating of the time and effort needed for effective study.

In sum, the reasons for students dropping out of their studies can be grouped into four main categories: 1) professional; 2) family/ personal; 3) health; and 4) academic.

a) Professional reasons (*Profess*) relate to students' underestimation of the time required to balance their academic and professional obligations. This category also encompasses major changes that occur in students' work life (i.e., work transfer or promotion).

b) Family and personal reasons (*Fam-Per*) relate to marriage, pregnancy, childbirth, childrearing, travel problems, death of a family member, separation and/ or other personal reasons (some of which students' are not willing to discuss with the interviewer).

c) Health reasons (*Health*) relate to personal health issues or family health challenges (i.e., parent's, husband's, wife's, sibling's, child's illness).

d) Academic reasons were divided into two sub-categories: *Acad1* and *Acad2*. *Acad1* relate to lack of assistance from tutors (real or perceived), improper learning materials/ teaching methods used, and/or students' inability to understand the course learning material sufficiently to satisfy minimum academic obligations on written assignments. *Acad2* relates to students who admit that they lacked adequate prerequisite knowledge (for a specific course) to pursue university-level studies and had to drop out as a direct result, wrong choice of the program, or found they had no interest in the topic.

**Table 9.** Reasons Cited by Students for Dropping Out

Reasons	Informatics		Studies in Education	
	N	%	N	%
<i>Profess</i>	150	43.0	50	46.3
<i>Fam-Per</i>	64	18.3	29	26.8
<i>Health</i>	24	6.9	12	11.1
<i>Acad1</i>	44	12.6	9	8.3
<i>Acad2</i>	67	19.2	8	7.4

### ***Professional (Profess)***

Reasons for dropping out outlined in Table 9, comprise 47 percent of Studies in Education, and 43 percent Informatics respectively for students who dropped out due to professional reasons. Academic workload versus occupational demands constitutes an urgent and unpredictable factor. Upon closer examination, however, reasons cited by students for dropping out tend to stem from their erroneous evaluation of the amount of time they actually have available to study versus what is needed. Studies at the HOU require hard work and students must devote plenty of time to studying – realistic academic demands that many student dropouts fail to realize prior to enrolling.

### ***Family-Personal (Fam-Per)***

The Family-Personal category includes reasons such as marriage, divorce, childrearing, pregnancy, socio-economic problems, and other related factors. Reasons cited by student dropouts in this case are “not unexpected” factors that led them to abandon their studies. To a great extent such changes are typical events that occur in adults’ everyday lives – some of which that nonetheless have immediate consequences that affect their everyday routine and thus upset their academic plans.

Twenty-seven percent of the Studies in Education sample, and the 18 percent of the Informatics sample, indicated they elected to dropout owing to family reasons that altered their daily routines, and which did not allow them to attend to their studies. Similar to the “Professional” reasons cited above, these students’ miscalculated their time available to balance their academic and family obligations. A significant percentage of those student dropouts surveyed indicated that they gave up on their studies because they had not taken into account the impact their academic commitments would have on their personal lives (i.e., the reduction of time available for their family versus what they needed to be successful students).

Health problems are also included in Personal category of unexpected events that led students to abandon their studies. Eleven percent of student dropouts in Studies in Education students, and seven percent in Informatics, cited health complications as their primary reason leading to their decision to discontinue their studies. As such, there are truly “unexpected” events independent from the students’ programming and their studies at the Hellenic Open University.

### ***Academic (Acad1 / Acad2)***

The Academic category is directly related to students’ experiences with their studies. Sixteen percent of student dropouts in Studies in Education, and 32 percent of those enrolled in Informatics, indicated they elected to discontinue their studies for academic reasons. Due to the significance of this category, the reasons cited by student dropouts are presented in detail. Forty-seven percent cited erroneous course selection, which they indicated as being of no professional interest or value. In sum, it was the students’ “wrong choice” that led to their decision to discontinue their studies.

Twenty-eight percent admitted they were not qualified enough (did not have the required knowledge for the specific course) to pursue university-level studies, which thereby compelled

them to dropout. Thirty-eight percent indicated that the method of studying as the reason why they elected to give up on their studies.

Difficulty of the educational material was cited as the reason for dropping out by 13 percent. Student evaluation of the educational material is essential in distance learning settings. Student dropouts' opinions of the educational material used, therefore, is of great importance to HOU, as they represent those students who "did not make it." HOU's aim therefore is to determine "why" these students did not make it. Although students who dropout cannot – or should not – dictate the difficulty levels of course materials on offer, their opinions can be used to develop more intuitive learning materials to help them learn and comprehend difficult topics and subjects. Twenty percent of this sub-sample found the educational material very difficult or difficult.

Nine percent claimed that although they were able to understand the course materials, they could not fulfill their obligations related to the written assignments, thus compelling them to dropout.

When asked about their opinion about the tutor, the vast majority of dropouts (82 percent) indicated that they had no problems with their tutor, and felt they were offered all the assistance possible. The remaining 18 percent indicated they had some problems with their tutor. Of this 18 percent who cited problems with their tutor, 23 percent mentioned communication problems (i.e., slow response time to their letters, difficulty to reach by telephone, etc.); 40 percent cited tutors' lack of assistance in helping them understand assigned materials and written assignments; seven percent claimed that their tutor did not convince them they had the required knowledge to continue; five percent claimed the tutor not communicate well during face-to-face meetings. Another 9.5 percent cited lack of assistance from their tutors (or less assistance than was expected by the student).

It is worth noting that although the HOU is a newly established institution, 95 percent of the student dropouts surveyed feel that the University meets important social needs of the Hellenic/Greek community, and as a consequence they hold positive opinions of HOU. When asked to comment on why they dropped out of their studies, and give their opinion on the studies offered by the HOU, 67 percent of the student dropouts indicated that Hellenic Open University courses are very well organized, but for various reasons (not related to their studies or tutors) they felt that they could not continue. Fourteen percent of those who dropped out felt that the education offered is useful, but it is aimed at students that are working with, or in some way related, to the subject of the studies. Eighteen percent believe that significant improvements should be made to the quality of the studies offered. Finally, two percent held negative opinions of the education offered by the Hellenic Open University.

## **Conclusion**

The study of these two different courses targeting two distinct groups of students – undergraduate and graduate – revealed considerable similarities in terms of dropout percentages, and underlying reasons that compelled them to interrupt/ discontinue their studies. There were important differences as well, however.

Gender does not appear to have a significant role in compelling students to interrupt/ discontinue their studies in both groups, including those dropouts age 30-39 who are the most vulnerable because they face the daily challenge of balancing family and/ or work issues with their education. There is no statistical significant difference between employed and unemployed



students, although most are employed (most distance learning students are employed). Finally, students enrolled in Informatics and Studies in Education, both tend to dropout at the second written assignment phase.

Lessons that can be learned from the data presented here is that DE tutors should first recognize which students/ student groups are most vulnerable to dropping out (e.g., students age 30-39), and secondly, encourage and support these vulnerable students/ student groups by paying close attention to their needs during the first half of the academic year (up until the second written assignment has been successfully delivered). Clearly, tutors should provide support and encouragement to all students irrespective of the course they teach, but sensitivity to a particular vulnerable student or student group should also be a priority for tutors.

For comparison between the Informatics course and the Studies in Education course, in the Informatics course there are twice as many dropouts in the overall number of students enrolled, twice as many dropouts age 30 or younger, and twice as many dropouts whose profession/ employment situation is not related to informatics, as compared to the analogous percentages calculated for Studies in Education.

This finding reveals that the overall anticipated percentage of student dropouts tend to be much higher in undergraduate courses as compared to postgraduate courses. This may be explained by the fact that undergraduate students typically lack university-level academic experience. This finding also reveals that students' professional standing (e.g., exposure/ personal interest in the field or actual work experience) is highly relevant at the undergraduate level and mitigates against dropout. On the other hand, this factor does not seem to hold much importance when it comes to postgraduate level studies.

The findings also suggest that tutors should encourage and support undergraduate students age 30 and under, and those who are over age 39 at a postgraduate level. Support and encouragement is likewise crucial at both levels for students in the 30-39 age group for the aforementioned reasons. These findings suggest that undergraduate students, age 30 and younger, may not appreciate the time and effort needed for successful study. Graduate students, on the other hand, age 30 or younger, by virtue of their previous academic experience (and arguably their desire to succeed professionally and academically) are intensely aware of the effort required, and therefore they are not as vulnerable as similarly aged undergraduate students.

There were similarities concerning the numbers of students who elected to drop out because of family, personal, or health reasons. Such reasons, relate to childbirth, child rearing, marriage, pregnancy, travel problems, decease of a family member, and other personal reasons (some of which the students were not willing to discuss) or reasons related to personal or familial health problems.

According to the respondents, the most significant reasons they cited for dropping-out stems from their underestimation of the actual time they have available for studying versus their other obligations, and/or unforeseen changes in their daily/ work environment (e.g., promotion, travel, transfer, pregnancy, death) that affected their ability to continue with their studies. This phenomenon is more evident undergraduate level where students typically possess little or no previous experience in university level studies. At postgraduate level however, where previous academic experience is present, dropout numbers are significantly lower.

According to the data collected, the educational materials used and interaction with tutors did not seem to make things so difficult for students, as to lead them to dropout of their studies. Only a small percentage cited tutors or educational materials as the reason for dropping out.

Overall, those students who elected to drop out of their studies, tend to regard the educational offerings of Hellenic Open University as positive. They see the studies offered by Hellenic Open University as well organized and the education useful.

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August – 2004

## ***Book Review – Advancing Online Learning in Asia***

**Editors:** David Murphy, Namin Shin, and Weiyuan Zhang. (2003). *Advancing Online Learning in Asia*. 277 pages, softcover. Open University of Hong Kong Press: ISBN: 9 6277 0731 7

**Reviewed by:** Insung Jung, International Christian University, Japan

The Internet, high-speed electronic communications, and computers have transformed the way we teach and learn. With the development of these new information and communication technologies, the idea of online education has been adopted in many developed, and more recently in developing countries, to bring wider opportunities to people in the form of increased access to flexible and interactive, open and distance learning systems. As stated in the Introduction of “Advancing Online Learning in Asia” edited by Murphy, Shin, and Zhang, online education is now everywhere and it “is changing the ways in which educational institutions interact with their students, for both traditional and distance education universities.” By examining recent developments of online education in Asia from multiple perspectives, this book has a potential to be an invaluable resource to educators. Taking cases from the Asian region in which online learning was introduced, implemented, and experienced, this book presents the cases from a number of perspectives, especially from student perspectives, and addresses pedagogical and technical issues faced by online educators. The breadth of the articles in this book provides a wide range of online learning cases and varied perspectives, which should clearly appeal to educators, researchers, administrators, and policy makers in online education.

Chapter contributors are mostly researchers, professors, and educators. Even though their articles vary from the specialized to the general, most are practical rather than theoretical. The articles are arranged in four broad categories: introduction to the context of online education, learner perspectives on online learning, teacher perspectives on implementation of online education, and new experiments with online technology.

The first three chapters address the first category and provide an overview of the development of online learning with specific applications across Asian countries, and discuss implications of online learning for culture, community building, and learners. These chapters are essential reading for the appreciation of the more specific case studies that follow.

This introductory section is followed by six chapters (Chapters 4 – 9) that illustrate online learning cases and perspectives of online learners in different contexts. Online learning experiences of learners from different Asian countries – Hong Kong (China), India, Malaysia, and Philippines – are analyzed using a variety of research methodologies. Throughout these chapters, some of the factors affecting online learners’ perception toward online education are identified, and strategies to maximize effectiveness of online education and provide pedagogically sound learning experiences to online learners are suggested.

Views of teachers on online education are also discussed. Chapter 10 includes teachers’ perceptions on online education. This chapter highlights different viewpoints on online learning environment. For example, whereas students indicate the convenience of online communication

in dealing with assignment as the greatest advantage of online learning environment, teachers see online learning environment as an effective time management tool rather than an interactive communication tool. Understanding these multiple perspectives is emphasized, with the objective of bringing about more advanced online education. The following article in Chapter 11 draws our attention to cyber-cultural issues in online teaching and learning, and addresses the need of “cyber-culture literacy” skills of teachers and learners to develop effective online education in the context of China.

Chapters 12 – 16 introduce innovative pedagogical and technological applications in online education, and discuss issues related to the improvement of current online education systems. Chapter 12 focuses on the use of online education for students with special needs. Teachers who participated in online education for special education in different contexts are interviewed, and their experiences are reported. The authors of this article conclude that online technology can be successfully integrated in special education. Chapters 13, 14 and 15 report effects of introducing online innovations in education. All the innovations – the interactive virtual laboratory system, online activities in an online training course, ISDN-based distance learning system, and the Internet-based distance learning system – reveal some benefits and limitations. Among them, the technological divide between countries is indicated as one limitation in advancing online education. The final chapter in this book discusses a conceptual and technical framework of developing database on and for ODL research with an intention to contribute to the advancement of online education.

The value of this book can best be highlighted when we review the purpose of online education. The purpose of online education in general is to expand access to educational opportunities for individuals scattered all over the world, to remove barriers of time and space, and to develop a cost-effective approach that provides an interactive learning opportunity. In addition, online education can meet the need of adults with more pragmatic concerns. The cases explored in this book prove that online education has contributed to expanding access to education, overcoming time and space limitations, and providing flexible and interactive learning environment.

In closing, I would like to add two points, which I feel might have contributed to the integration of the all chapters in this book. As indicated above, this book is mainly focusing on practical cases from the field. Even so, a theoretical framework or a summary of previous research findings in a conceptual way would have provided an anchor for online learning applications and related issues addressed in each chapter. For example, several factors affecting the advancement of online learning have been identified and categorized as instructional design, social, and students’ personal factors. Those factors could have provided a framework to understand the results of the studies presented in this book. An overall theoretical or conceptual framework could have also been introduced at the beginning of the book. Another point I would like to mention, is that even though each article offer conclusions, the book itself does not have a concluding chapter. In a concluding chapter, a summary of the suggestions made in each article to advance online education in Asia, and future directions or challenges could have been discussed. Online education is still in the process of development. Our future online education will need to adapt to more advanced technological and social challenges. This book greatly contributes to our understanding of the essence of online education from multiple perspectives.



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August – 2004

## ***Book Review – Distance Education and Distributed Learning***

**Editors:** Charalambos Vrasidas and Gene V. Glass, (2002). *Distance Education and Distributed Learning*. 231 pages, softcover. Greenwich, CT.: Information Age. ISBN: 1 9315 7688 2

**Reviewed by:** Ramesh C. Sharma, Indira Gandhi National Open University, India

As universities and educational institutions around the globe strive to adopt and expand the use of information technologies in their teaching/ learning offerings, this book, *Distance Education and Distributed Learning*, will help those engaged in coming to grips with this fundamental paradigm shift taking place in education. This book addresses a wide range of issues related to distance education and online technologies. In the broadest sense, today's technology-driven changes in distance education will help make students and teachers more aware of social justice and equity through the use of technology used to solve real life problems irrespective of time and space, culture and ability to participate. Distance education has changed over the years, and even more so since the introduction of Web-based technologies. Today, the trend is towards globalization and collaboration among educational institutions. Distance educators and students now have access to emerging opportunities to engage in higher quality education irrespective of time and space.

*Distance Education and Distributed Learning* addresses the latest thinking on the integration of older and new teaching and learning technologies. Comprised of ten chapters written by renowned scholars, this book examines issues pertaining to the use of interactive media in distance education contexts. Discussed are issues related to interactive media design, learning experiences, student assessment for the online environment, hidden curriculum of e-learning, research in distance education, and online education in a global village settings.

In the book's preface, Sir John Daniel touches upon the hybridization of distance education and conventional teaching. The book then moves on to its opening chapter "Designing and Studying Learning Experiences that Use Multiple Interactive Media to Bridge Distance and Time," written by Dede, Whitehouse, and, Brown- L' Bahy, who present their research findings based in a grounded constructivist perspective on student participation and media use. By examining a case study of a Harvard Graduate School of Education course "Learning Media that Bridges Distance Education," Dede and colleagues focus on student's experiences in terms of the social, affective, and cognitive dimensions found in distributed learning classroom settings. To set the tone for their research, the authors examined a theoretical framework based on distributed cognition; active and collective construction of knowledge; social constructivist models of learning; situated learning; learning styles; and asynchronous and synchronous learning environments. Their research ultimately revealed that learning is, in fact, enhanced in virtual learning settings, be it asynchronous and synchronous. Indeed, less than half of those students surveyed selected face-to-face interaction as their preferred choice of learning medium. One important aspect of the research presented in this chapter, was the finding that learners' educational experiences change as they interact with integrated media.

Chapter 2, written by the editors and entitled: “A Conceptual Framework for Studying Distance Education” launches headlong in to the intellectual fray with the assertion that a paradigm shift is taking place in distance education, one which seeing the shift from that of simple correspondence education to more sophisticated and distributed modes and models of interactive learning. The authors support this assertion by presenting theoretical and methodological context of their research conducted at the Center for the Applications of Information Technologies, at their home institutions: the Western Illinois University and at Arizona State University. They discuss how context, interaction, learner control, social presence, and feedback contribute to a workable framework for studying distance education. After special mention of Moore’s theory of transactional distance, the authors’ then focus on supporting research that examine the use and improvement of technology for different teaching and learning modalities.

Chapter 3 entitled: “Rethinking Assessment for the Online Environment,” is written by Robin Mason, a specialist in the design and evaluation of online courses. Mason focuses on cultural issues in terms of online global teaching, synchronous and asynchronous technologies, and models of virtual universities. Taking as her queue the benefits and difficulties we, as distance educators, face in the online teaching environment, Mason stressed the necessity for re-casting assessment practices. She defines what student assessment “is” in an online environment, and describes its practical application. Mason presents different forms of Web-based and online assessment, and raises serious concerns over cheating, manipulating information, and plagiarism in an online environment. In a nutshell, Mason urges us to rethink on how we should apply accepted best practices found in the traditional system, to that of the online medium.

Chapter 4, “Learning to Solve Problems Online” written by David H. Jonassen, moves the book’s focus away from educators and online course developers, to that of learners. Simply put, Jonassen places emphasis on student problem solving in online learning environments. He first defines what problem solving is, followed by a typology of problems ranging from ill-structured to well structured problems, how to incorporate story problems, puzzles, algorithms, decision making, trouble shooting, rule using problems, strategic performance, system analysis, and dilemmas. Jonassen stresses that to motivate online learners to solve problems, then online learning environments and supporting systems must be re-engineered to support learning for solving problems. According to Jonassen, however, convincing universities and businesses in promoting problem solving in online learning is a crucial problem that must be addressed first.

As the title of Chapter 5 suggests, it deals with the “Embodiment of Knowledge in Virtual Environments.” It is here that that author, Rob Walker, discusses the exact nature and role teacher plays in distance education vis-à-vis issues of human interaction and teaching philosophy. He analyses the changing face of distance education in terms of convergence of conventional and distance teaching, or as Otto Peters succinctly puts it “The integration of the elements of the three main forms of learning and teaching provides the university, whose traditional ways of working have solidified and quite often become ritualized, with a flexibility and variability that it has never before experienced. In this way, it is now able to deal with the special private situation and occupational requirements of older students as well, and to take sufficient account of them. For this reason, it will no longer prescribe fixed and binding locations and times for learning and personnel for teaching. Studying may be started, interrupted and restarted at any time, and may be carried out either full time or part time, whereby students may also switch between the two forms. Where this is necessary and possible, the curricula can also be oriented more closely to students’ private and vocational experience, as studying will become extremely individualized and student-centred, and mainly based on self-learning.” (Peters, 2000: 19). In the face of technology growing importance and use, Walker examines efforts underway in developing alternative pedagogies for new and emerging distance education modalities (i.e., virtual classrooms).

Chapter 6's author, Terry Anderson delves into the "Hidden curriculum of E-learning." According to Anderson, hidden curriculum holds both advantages and disadvantages for learners, and asserts that there must be fair and unbiased evaluation of these issues to ensure the highest road is taken. To clarify his argument, Anderson grounds his assertions in four e-learning contexts: 1) learning to learn; 2) learning the profession; 3) learning to be the expert; and 4) learning the game.

In Chapter 7, "Distance Education and the Professorate: The Issue of Productivity," Thomas C. Reeves asserts that faculty productivity is a complex variable and therefore difficult to measure. According to Reeves, the public often has erroneous perceptions about faculty; moreover, even higher education administrators often perceive faculty colleagues as uncooperative. Focusing his discussion on time spent by faculty in teaching and value of teaching over research, Reeves reveals serious concerns in terms of understanding faculty productivity, as well as faculty's future in distance education. Reeves argues that emerging business forces, new technologies, teacher autonomy, course delivery, etc., are elements that determine the professorate. There are content specialists, external providers, technologists, and part- and full-time faculty providing tutorial functions. In sum, Reeves paints a picture that foresees no need of human faculty in future distance education systems. This author strongly favours rigorous research in the area of faculty productivity, and calling for adopting pragmatic epistemology, stresses that the nature of research into this area needs to be developmental. Reeves cautions, however, that such developmental research should also seek solutions to real problems, and construct design principles used to arrive at future decisions.

Chapter 8, titled: "Evaluation and Research in Distance Education: Implications for Research", was written by Gary J. Anglin and Gary R. Morrison, covers evaluation and implications for research in distance education. This chapter begins with an examination and evaluation of research into different distance education delivery modes like correspondence, radio, television, two-way audio-video courses, and Web-based instruction. Anglin and Morrison recommend the need for clear distinctions to be made between basic, applied, and evaluative research.

In Chapter 9, Linda Harasim, an international expert in online education associated with designing, implementing and evaluating networking applications in the USA, Latin America, and Canada, examines what exactly makes online learning communities successful. She supports her viewpoint using a three phase theoretical framework: idea generating, idea linking, and intellectual convergence. To illustrate her point, Harasim presents a short examination of an international community of online educators called the Global Educators' Network (GEN). According to Harasim, the success of an online learning community depends on certain success indicators, like contextual and signifying descriptors of success (i.e., user reports, active participation and longevity, engagement indicators); and substantive indicators that signify analytical markers (i.e., social discourse and intellectual progress).

The last chapter of the book, "Of Nomads, Polyglots, and Global villagers: Globalization, Information Technologies and Critical Education Online" by Michalinos Zembylas, Charalambos Vrasidas, and Marina S. McIssac, critically examine the role of distance education in the 21st century. Discussed are the changing modalities of traditional and online education in view of globalization forces. Zembylas, Vrasidas, and McIssac urge readers to assess the implications of globalization, and the role of new technologies and emerging pedagogies. An important question emerging from this discussion is: What shall be the nature and impact of the increased use of technology in education? An understanding of the cultural, political, economic, and pedagogical challenges would reflect on the implications of global distance education concept. The metaphor of the "Nomad" (Deleuz and Guattari, 1983, 1987) and the "Polyglot" (Braidotti, 1994) has been critically examined to find answer on to how information technologies can be used to benefit the



underprivileged. To harness the full potential of Internet in education, the authors favour development of critical sensitivities and critical literacy. To achieve the above within the context of nomad's and polyglot's mode of thinking, the authors identify three characteristics: critical emotional literacy, collective witnessing, and collective intelligence. According to the authors, these tools must be utilized for empowering individuals and groups to be critical of the status quo and to work for peace, justice, and equity.

Overall this book, decorated with a simple yet elegant cover design, makes an excellent treatise. All the contributors have presented their thoughts and experiences in an impressive manner supported by relevant research. Each chapter provides an excellent list of references. This is a well-researched volume, which in a nutshell wisely advocates the use of open and distance education and Networked technologies in teaching and learning settings. The authors have shared their international experiences. I personally suggest that this volume would be useful to both those interested and actual practitioners in the area of online learning and open and distance education.

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August – 2004

## Technical Evaluation Report

### ***31: Internet Audio Products (3/3)***

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#### **Abstract**

Two contrasting additions to the online audio market are reviewed: *iVocalize*, a browser-based audio-conferencing software, and *Skype*, a PC-to-PC Internet telephone tool. These products are selected for review on the basis of their success in gaining rapid popular attention and usage during 2003-04. The *iVocalize* review emphasizes the product's role in the development of a series of successful online audio communities – notably several serving visually impaired users. The *Skype* review stresses the ease with which the product may be used for simultaneous PC-to-PC communication among up to five users.

**Editor's Note:** This paper serves as an introduction to reports about online community building, and reviews of online products for disabled persons, in the next ten reports in this series. *JPB*, *Series Editor*.

#### **Product Trials**

##### **iVocalize**

1) *iVocalize* is an audio conferencing software with screen reader capability (tested and reviewed by Linda Matula Schwartz). The ability to generate a sense of community among students is an important aspect of distance education. A wide range of online communities has been established around a particular software product, *iVocalize*. These groups include:

- *The Access Technology Institute*, which provides software training and discussion forums on technology for persons with visual impairments and their trainers.
- *Audio Avenue*, of the Mid-Illinois Talking Book Center, provides an online community for programming, distance training and outreach to librarians and other professionals serving persons with visual impairments.
- *Audio-Tips*: this online group began as an *iVocalize* audio chat program for persons with visual impairment. Now open to the general public, sighted people and those with impaired vision mingle in an online community.
- *Global Learn Day*, sponsored by the Benjamin Franklin Institute for Global Education, uses *iVocalize* in conjunction with a telephone call center to provide an annual 24-hour international forum showcasing innovative educational projects.

- Mississippi State University (MSU) uses *iVocalize* in conjunction with *WebCT*, to review course material, to prepare recordings for students and for weekly class conferences incorporating instructor and student *PowerPoint* presentations (Puckett, personal communication, 2003).
- *Webheads in Action*, an international group of instructors for English as a second language, is part of the *Tapped In* online community of distance education professionals. One group activity (<http://www.alado.net/webheads/>) uses *iVocalize* for an informal weekly forum. Community participant, Michael Coghlan, estimates that the group has experienced 90 percent reliability in using *iVocalize* (personal communication, 2003).

## Features

*iVocalize* provides synchronous multipoint voice-over-IP audio conferencing and compatibility with selected screen reader programs. Minimum system requirements include a 266 MHz Pentium computer, with 64 MB RAM, Windows 98 SE or later, 28.8K dialup connection (56K recommended, dual channel sound card, and *Internet Explorer* 6). For recording sessions, microphone, speakers/ headphone, and *Windows Media Player 9.x* are required. User features include synchronous audio and text chat; time stamp on text entries; speaker queue; private conversations; active participant list; website/ presentation navigation; adjustable text area; favorites list; and active URLs in text chat. The browser design allows users to activate links in the presentation without disturbing other users who continue to see the page sent by the moderator. Additional features increasing accessibility for visually impaired persons include:

- Keyboard shortcuts
- Adjustable font size and color
- Sound alerts – participant entry/ exit; control key to speak; keyword detected in text chat
- Private message sent/ received
- On-screen volume control to eliminate need to navigate to *Windows* sound control
- Compatibility with *WindowEyes* and *Jaws* screen reader software
- Append text icons to user names
- Highlight new text messages
- Suppress private conversation tabs
- Suppress colors in text messages

A *PowerPoint* converter allows asynchronous presentations of slides saved to an FTP server or images available via URL. Recordings, played back via *Windows Media Player*, synchronize all audio, text chat and websites/ slides presented in the main room. Access to the recorded file is via a webpage with an automatically generated HTML link. Private conversations are not recorded. At the basic transmission rate (13 kbps), a one-hour presentation compresses into a 4.5 - 4.7 MB file. (A comparable .wav file would be approximately 80 MB.) Web tours can be broadcast, with recorded audio, but without text or audio chat. Features under development include application sharing and file-transfer, video, Japanese language support, and server integration with external database. *iVocalize* works well with *Dragon Naturally Speaking Preferred* voice recognition software, allowing a blind person to enter text into the chat area by speaking rather than of typing (Murtha, 2003; retrieved July 28, 2004). The accessibility of the product's audio accessibility for hearing-impaired users needs investigation.

## Complexity and Control

*iVocalize* is intuitive and extremely easy to use. The user navigates to the host website, and enters a name and optional password. The software is installed in minutes, automatically when *Active X* is enabled in *Internet Explorer*. Installation may also be done manually. Server installation was

not tested during this review. Navigation is driven by drop-down menus and/ or keyboard shortcuts. Moderator status is configured through a separate administrative module. The moderator has complete control of the tool: audio and text mute, broadcast mode, recording, time stamp on text entries, active participant list, microphone control, audio quality and text chat control. Up to three private conversations can be held in addition to the main conference. Access controls include: block user, room lock, speaker queue, disconnect speaker, volume control, password management, and tool privilege levels. Customizable features include: program icon, room layout, background, banners, border, and menu. Technical support is provided by email, online documentation, and a live 24/7 audio/ text chat help desk.

## ***Clarity***

*iVocalize* was tested with 28.8K and 56K dialup and broadband connections and performed very well. Screen layout is uncluttered and logical. Audio volume and quality varied widely among users in trial sessions. An initial audio check is essential to make adjustments. No audio delay was experienced, even with 28K modem access. Audio quality can be adjusted at variable bit rates. Use of the product for music instruction might, for example, require very high quality audio, while lower quality is sufficient for voice chat. Recorded audio was very clear. Users may intermittently be dropped from a conference. Often the session continues to be audible and the user is reconnected to the server automatically. The use of simultaneous tools did not affect presentation quality. A trial with a demonstration version of the *WindowEyes* screen reader software did not reveal any compatibility problems. During an international conference, some technical difficulties were experienced, but these were not inconsistent with other conference products involving worldwide attendance. An Internet server problem traced to a router in another country caused many users to be booted out of one session. Technical support was available owing to the magnitude of this particular conference.

## ***Common Technical Framework***

Support for the *Macintosh*, *Unix*, and *Linux* platforms is planned for 2004. Alternatively, a *Windows* emulator may be used. Scalability was not tested. *Talking Communities* indicates that the program can accommodate in excess of 1,000 users. Http tunneling support is incorporated. File sharing is not supported. Full Unicode support allows the program to display commands in multiple languages.

## ***Cost***

A free trial of *iVocalize*'s conferencing features may be obtained through the product developer and vendor, *iVocalize* LLC. A single click on the *iVocalize.com* website creates a trial three person conference room. *Talking Communities*, one of the web conferencing services that uses the product, operates a room rental service. Rental prices are in the region of \$3-5/ seat/ month, depending upon features. The user operating system requirement is Win/2000 or later, and the server software is available via purchase, lease or rental from the vendor alone. Purchase pricing is based on a one-time cost of US \$60 per user (20-user minimum). Server lease prices range from \$1 - 6/seat/month (50-user minimum). [Price check updated October, 6, 2004, *JPB, Series Editor*]

## **Skype**

*Skype* is PC-to-PC telephone freeware (tested and reviewed by Adrienne de Schutter, Patricia Fahrni and Jim Rudolph; updated 28/July/04).

*Skype* provides a simple and user-friendly means for 2-5 people to communicate in real time over the Internet using either audio and/ or text. The beta version of *Skype* was tested, released in 2003 by the developers of the successful *Kazaa* audio file-sharing software. The product initializes a direct connection between the users' IP addresses. It allows users free online calls locally and internationally, although the developers suggest this may change in future releases. The process of downloading and configuring *Skype* was relatively straightforward using the installation wizard, which in one case seamlessly configured the software to a testers' firewall. Establishing voice communication was a simple matter of selecting the other user's name from a previously created list, and clicking on the call icon. Unlike other audio-conferencing products, there is no need to invite users into a private chat room: communication is direct between users. It can also be enhanced using the text feature. On the inexpensive headsets used in our tests, audio clarity was very clear – in fact comparable to standard telephone technology. The software is intuitively easy to use, and a help file plus answers to frequently asked questions are available online.

A drawback of the program is its restriction to no more than five simultaneous users (**Note:** up to four users were possible during our test of the beta version). Establishing an address list requires the user to know the *Skype* IDs of each person in order to add them to the list. *Skype* operates on *Windows 2000 and XP* platforms. Its audio transmissions are routed using peer-to-peer (P2P) technology, by which each end-user's PC is utilized for traffic routing, processing, and additional bandwidth. By contrast, other IP audio programs may utilize one or more central servers to perform these functions. *Skype*'s decentralized approach (messages passed directly from one user to another) helps to encrypt communications. The compression algorithm for voice communications can be configured to operate on a 28k baud modem.

### ***Update***

*Skype v.1.0* has been released on July 27, 2004 with enhancements including file-transfer and support for mobile phone users.

## **Conclusions**

For distance education (DE) users, *iVocalize* is an intuitive, user-friendly *Windows*-based audio-conferencing software with a wide range of useful features. The product's browser-based design makes it unusually easy for computer novices to install and use. *iVocalize* combines modest hardware and software specifications with a reasonable pricing structure, particularly for educational organizations unable to provide high-speed bandwidth. DE students can review archived recordings in revision work or as a substitute for a missed conference. Broadcast presentations can be used as online seminars or demonstrations. The product could also be configured to reach a wider DE audience by the addition of a telephone call center and relay for radio broadcast. This would be particularly valuable for students with minimal Internet access. The support planned for the *Macintosh*, *Unix*, and *Linux* platforms will increase the product's utility. The special value of *iVocalize* for disabled users suggests numerous valuable questions for further testing.

As with *iVocalize*, *Skype* is easy to use and install. As long as only audio conferences are small (five or less), the product provides economical and straightforward service. Both of these products represent a new generation of online audio products, emphasizing cost-effectiveness and ease of use.

The next report in the series discusses Internet audio and accessibility issues.

**N.B.** Owing to the speed with which Web addresses become outdated, online references are not cited in these summary reports. They are available, together with updates to the current report, at the Athabasca University software evaluation site: [cde.athabascau.ca/softeval/](http://cde.athabascau.ca/softeval/). Italicised product names in this report can be assumed to be registered trademarks.

*JPB. Series Editor, Technical Notes*



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August – 2004

## Technical Evaluation Report

# ***32: Using Internet Audio to Enhance Online Accessibility***

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### **Distance Education and Online Accessibility**

What constitutes online accessibility? Vanderheiden, Harkins and Barnicle (2002) indicate that accessibility involves the ability to use online content *without vision, without hearing, without pointing or manipulation, and without speech by persons with cognitive limitations, with language disabilities, with low vision and limited or no hearing, and with alternative languages.*

The impetus to provide accessibility in online learning comes from many sources. First and foremost, it is the moral thing to do. Houtenville (2003) indicates that 1 in 13 people aged 18-64 in the United States reports a disability; and this population may be expected to increase as the population ages. Blair, Goldmann and Relton (2004) report that 10 – 20 percent of post-secondary students in 2002 identified themselves as having a disability. Schmetzke (2001) found, however, that only 15 percent of 219 DE homepages examined with *Bobby* (an accessibility validation tool from the Center for Applied Special Technology) were free of major accessibility errors. Similarly, a study by the National Center for Education Statistics (2003) indicated that 95 percent of 2- and 4-year institutions offering distance education (DE) courses use websites for course delivery, but that only 18 percent of these sites ensured accessibility to a major extent. A recent British Disability Rights Commission study indicates that these trends still prevail, with more than 80 percent of websites unusable by persons with disabilities (Adams-Spink, 2004). Rowland, Burgsthaler, Smith and Coombs (2004), report the specific under-utilization of DE programs by disabled students, possibly due to the failure of those programs to adapt to their needs. DE institutions, no less than face-to-face (f2f) ones, should give accessibility issues a high priority.

It is also the right thing to do pedagogically. Anyone who has viewed a *PowerPoint* presentation on the Web can attest that slides without captioning and/or narration are usually not very informative to anyone. Accessible features can result in enhanced learning for all students (Nielsen, 2000). Accessible design benefits students with other disadvantages to learning besides physical limitations or learning disabilities. Burgsthaler (2002) indicates that students for whom English is a second language may have reading difficulties similar to individuals with certain learning disabilities; and Edmonds (2003) indicates that accessibility features can particularly benefit students who speak a different language from that used in the course, or who receive instruction from a non-native speaking instructor. Elderly learners can also benefit. In addition, educational institutions frequently require students (campus-based and virtual) to use online technology to access library catalogs, for example, and to obtain information from institutional websites. It is important that people desiring education not be caught, as Burgsthaler (2001)

states, on the wrong side of a “second digital divide” – i.e., without full use of technology, services and information. Economically, the individual, the learning institution, and wider society all benefit from greater accessibility to learning (Sonstein, 2003).

Other factors encouraging accessible online course design include legislation (Harrison, 1999), market forces (Broadbent, 2002), and the incidental effects of burgeoning technology (Blair, Goldman and Relton, 2004). Accessibility is being mandated by legislation in many countries. As workforce accommodations for physically and learning disabled persons have developed, there is a need for these workers to have access to skills training. Students and their advocates are demanding equitable access, particularly with the adoption of technology in the classroom, whether it is on campus or online. Burgstahler (2002) and Slatin (2002) make the point that developing DE technologies with accessibility in mind yields better access than, for example, attempting to retrofit existing webpages or courses. Software developers are actively working to meet these needs, with products that make commercial sense as well as benefiting disabled users. Audio streaming, for example, found an initial, large audience via, for example, Internet radio application, and is now becoming a valuable tool for accessibility purposes (*see the previous report in this series*).

What does the future hold for accessible learning? Olenick (2004) indicates that the next major step in Internet development will be the improved integration of sound into websites. Sound is already used to enhance websites, but Olenick sees it becoming “a normal, expected part” of the Internet experience (*see next section*). Cutting-edge technologies will certainly improve accessibility. Strandvall (2003) gives the example of a developing technology, the *Nomad Augmented Vision System*, by which screen images are projected onto a “virtual computer screen” that floats before the user’s eyes. *VKey* (2002), similarly, is a virtual keyboard that can be incorporated into mobile devices, projecting a laser hologram of a regular QWERTY keyboard onto any flat surface. A tiny portable camera turns finger movements into navigation and text. Strandvall (2003) indicates that the use of mobile devices for “m-learning” will increase rapidly, for they are less expensive than desktop computers and permit flexible access from many locations. Vanderheiden and colleagues (2002) points out, however, that accessibility is not always be a high priority in the development of new information technologies. Indeed, new mobile technologies may actually hinder the accessibility challenge. The personal digital assistants (PDAs), for example, contain miniaturized keyboard features that are difficult for use generally, and have obvious accessibility issues.

Rowland and colleagues (2004) have summarized the situation for DE institutions in terms of three challenges:

- All standards must consider accessibility features
- Interoperability must be considered
- Standards must become widely known and enforced

And the message is being heard. Technology is improving access in regard to tactile graphic materials. Virtual reality tools and avatars are under development to supplant human interpreters by providing online sign language translation. Universal design principles are evolving to ensure that websites and online learning courses are accessible to all without the need for *post hoc* modification; and a range of accessibility standards and validation applications has been developed in this regard (*Appendix I*). Inherent in universal design is the need for accessibility not only of the general instructor-student interface, but also of the instructional components, including text, graphics, audio, and video. Universal design principles also assist the learning of persons without disabilities and those experiencing situational limitations such as noisy environments or the need for hands-free access (Burgstahler, 2001).



## Voice-Over-IP and Accessibility

Particularly valuable in the enhancement of online accessibility is the Voice-over Internet Protocol (VOIP) medium. VOIP compresses analog voice data and converts it into digital packets for transmission over the Internet, enabling speech, language translation, transmission of voice cues and emotion, as well as hands-free and eyes-free navigation. Other types of digital data, including graphics and video, may be transmitted along with the audio, enabling a wider range of communication media. The combination of audio and text, for example, permits the use of text chat, speech-to-text (STT), and text-to-speech (TTS) methods of value to users with disabilities. While often expensive to implement, TTS, STT, and captioning technologies provide an enormous amount of added accessibility. They can meet a variety of learning styles and benefit persons with visual, hearing, and speech impairments, and dyslexia. VOIP with video enables not only the incorporation of cues such as lip reading and sign language (using relay services for the deaf), but also para-linguistics and non-verbal communication. Vanderheiden, Harkins and Barnicle (2002) state that “providing only the ‘words’... may not communicate the full or intended message. Capturing... paralinguistic and non-verbal aspects when using text communication or translating from speech to text” provides more effective and accessible communication. Chong, Tosukhowong and Sakauchi (2002) indicate the value of STT and TTS techniques for enhancing student understanding of non-native instructors in, for example, online synchronous chats.

Particular features of VOIP with value in DE settings are: the reduction of long distance telephone costs to individuals and groups for online meetings, and the capability of using Web-cams. Various applications can be integrated including telephone, voice-mail, email, and text chat. Users can keep one telephone number that can be accessed from any computer with the VOIP software. Use of Extensible Markup Language (XML) allows open source software (OSS) applications to be created. A problem with VOIP is the fact that currently it is replacing a familiar technology, the telephone, with an unfamiliar one. It is reliant on Internet technology, and often on the need for costly broadband access. It requires all parties to use the same VOIP software; and VOIP often involves time delays due to variable routing of packets over the Internet, and it is not sufficiently reliable at this time for emergency calls. A particular delay problem occurs when students use a variety of bandwidth speeds for downloading (Foreman, 2003).

In improving online accessibility, course designers also need to consider that students will require additional assistive hardware. In the incorporation of video with VOIP to allow real time sign language transmission, for example, users need to possess a Web-cam; and in text translation a Braille device may be needed. Other assistive devices include alternative keyboards, pointing devices, and extra large monitors. Eilers-Crandall and Aidala (2000) indicate, however, that many Web-cams are not suitable for sign language owing to the speed of sign conversations, computer processing speed, and quality of Internet connection. This is important to recognize, because many sign language programs incorporate the use of relay services to connect to human interpreters, rather than using purely digital signing routines. In these relatively early days of VOIP software development, the question of interoperability also remains a consideration. It is important that the applications to work with *Macintosh* as well as *Windows* assistive technologies. A current problem with voice-recognition software is the fact that it needs to be laboriously “pre-trained” for efficient voice recognition. General VOIP accessibility barriers are outlined by Inclusive Technologies (Voice over Internet Protocol [VOIP] Accessibility). These barriers should be considered when choosing VOIP hardware and software.

- No carrier (telephone company) operation means less documentation and customer support

- Limited product support training can result in less customer support
- Poor signal compatibility with the standard telephone system
- Many VOIP phones cannot connect to the standard system
- Captioning and video description may not be available
- Some networks and routers do not allow VOIP
- Some VOIP phones are not compatible with screen readers
- Some VOIP phones rely on hardware displays or soft-keys with contextual meanings making them inaccessible for those with vision problems
- Some VOIP phones use touch-screens or other hard-to-use controls for operation, making them inaccessible for those with vision or mobility
- Problems for those using prosthetics
- Small or hard to read displays for those with limited vision or hearing difficulties
- Hardware installation may be hard to understand for those with cognitive difficulties
- Arranging peer-to-peer services is complex
- Graphics-rich screens may be hard to understand
- Some VOIP systems do not provide alternative audio for visual information
- Some VOIP phones incompatible with screen readers, magnifiers, and/ or high-contrast settings
- Some VOIP phones use moving text, which is not compatible with screen readers
- Some VOIP phones do not provide alternative visual display for audio
- Poor audio quality may result in unintelligible information
- Loss of synchronization between audio and video makes speech reading difficult
- VOIP headsets without a separate headset jack means audio cannot be turned off, and does not allow for external audio processing
- PC use may increase interference

It is important to provide the VOIP industry with motivation to address social responsibilities such as accessibility, quality of service, and universal service. This may require regulation. The United States Federal Communication Commission recently held a Solutions Summit (May, 2004) to examine accessibility issues. VOIP has also been the topic of two Solutions Summits arranged by the US Federal Communications Commission (FCC, 2004) to address concerns about accessibility for persons with disabilities. These Summits have questioned whether VOIP should be regulated, whether it is needed to ensure accessibility to persons with disabilities, and whether it is feasible.

## Conclusions

Accessibility to online education programs is an important factor that requires continued research, improvement, and regulation. VOIP applications provide significant opportunities to increase the accessibility of online distance education, by virtue of the additional features they incorporate.

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The next report in the series reviews authoring tools used in the creation of online learning environments.

**N.B.** Owing to the speed with which Web addresses become outdated, online references are not cited in these summary reports. They are available, together with updates to the current report, at the Athabasca University software evaluation site: [cde.athabascau.ca/softeval/](http://cde.athabascau.ca/softeval/). Italicised product names in this report can be assumed to be registered trademarks.

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## Technical Evaluation Report

# ***33: Evaluating Digital Authoring Tools***

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### Abstract

As the quality of authoring software increases, online course developers become less reliant on proprietary learning management systems, and develop skills in the design of original, in-house materials and the delivery platforms for them. This report examines the capabilities of digital authoring software tools for the development of learning materials. Seven software tools are evaluated, representing the following categories: single purposes; activity creation; course development and presentation; general presentation; testing and assessment.

### Evaluating Authoring Tools

Despite debate over the efficacy of multimedia, computer and Web-based learning materials (Clark, 1983; Greenagel, 2002), there is compelling evidence that they can be an effective and efficient means of delivering education at a distance in the right situations and conditions (Kirkwood, 1998; Bates, 2000; Mayer, 2001). The development of high-quality digital learning materials, however, involves a complex combination of subject matter expertise, instructional design knowledge, and technical skills (graphic design, photography, audio, video, computer programming, etc.). These result in long and expensive curriculum development cycles (Bates, 2000). Numerous “learning management system” (LMS) products have become available for the purpose of streamlining the process of online courseware creation and delivery. These tend to be expensive, however, and do not always give the students and teachers the flexibility they require. By contrast, a wide range of inexpensive courseware authoring tools has emerged, enabling courseware designers to develop effective in-house materials and delivery platforms.

For the purpose of this evaluation, seven authoring products were selected, representing the following uses:

- 1) ***Single Purpose Tools***: designed for basic purposes rather than for creating a suite of varied tools. Most tools in this category are not specifically designed for production of instructional materials.
- 2) ***Activity Creation Tools***: designed to produce small, stand-alone, interactive activities that may be incorporated into courses.

3) **Course Development and Presentation Tools:** specifically designed for developing and presenting online courses and training programs. These tools are typically organized around specific concepts, lessons, and modules.

4) **General Presentation Tools:** designed for the presentation of multimedia content, and with specific uses in online education, though not intended for this purpose exclusively.

5) **Testing and Assessment Tools:** designed to produce tests, quizzes, and other types of assessment for print, computer, and/ or Web-based delivery.

## 1. Single Purpose Authoring Tools

[**Note:** All evaluations were on a 600 MHz PC with 192 MB RAM and *Windows 98 SE*]

**Screen Hunter 4.0** is a freeware edition of a popular screen capture utility. It allows users to capture any image displayed on a computer screen and then paste the image into another application (*Word, PowerPoint, FrontPage*, etc.) or save the capture as a graphic file. The program worked well on the test system. It was possible to capture the entire screen, active windows, and rectangles of defined sizes quickly and easily. The “zoom tool” makes capturing rectangles very precise by showing a magnified view of the capture area. The help provided is sparse, but the program is so easy to use that this is not a problem. This tool would be especially useful for an instructor creating software-training materials that require students to see exactly what particular screens and operations look like.

### Summary

*Screen Hunter 4.0* is a free and reliable tool for the specific purpose of screen-capturing.

**Audacity 1.2** is a free, open-source audio editor that allows users to: record and play sounds; import and export .wav, .aiff, *Ogg Vorbis*, and MP3 files (others available through plug-ins); edit sounds using cut, copy and paste (with unlimited undo) functions; mix multiple tracks together; apply effects to recordings, including echo, change tempo, noise removal, VST and LADSPA plug-in effects. The program installed, uninstalled, and ran smoothly on the test system. The interface seemed different at first, but soon became comfortable to use. It was easy to record and compress sounds from the computer microphone (speech, etc.) to MP3 files, and fairly easy to cut and paste from the visual waveform view so as to remove or reorder different parts of a recording. The noise removal effect worked well in “cleaning up” a low-quality recording. The tool has the impressive ability to record and import from multiple sound sources, and to apply effects, then to mix them into an audio file (MP3 or .wav). For an instructor who needs to include extensive audio in their instructional materials, *Audacity* provides a powerful and usable option. The built-in help file is adequate, enough to get a new user started. Further help and examples are available on the product’s website.

### Summary

*Audacity 1.2* is an excellent, multi-featured freeware audio editing tool.

## 2. Activity Creation Tools

**Hot Potatoes** suite is a set of six authoring tools created by the Research and Development team at the University of Victoria Humanities Computing and Media Centre. The tools permit the

development of several types of interactive Web-based exercise. No prior Web programming knowledge is required. The user enters the data (text, questions, answers etc.) into a template, and the software creates the webpages for posting on the site. Almost every aspect of the pages can be customized. The following six tools are included: *JCloze* (creates fill-in-the-blank exercises, and is useful for reviewing vocabulary and for word pattern recognition); *JMatch* (creates matching and exercises and flash-card reviews; useful for reviewing vocabulary and definitions and for review drills on any subject); *JQuiz* (creates multiple-choice, short-answer, and hybrid questions; useful for reviewing and subject and self-monitoring of progress); *JCross* (creates online crossword puzzles, useful for reviewing vocabulary and definitions); *JMix* (creates mixed-up-sentence exercises; useful for verbal pattern recognition); *the Masher* (compiles activities created with individual *Hot Potatoes* tools into a single linked, indexed set.

In the tests, all the tools proved easy to understand and use. They support the inclusion of links, reading texts, images, and media files in the learning materials, though these materials must be obtained from other sources. The activities created have obvious value for teaching basic language education skills. Higher-order functions of analysis and synthesis would be more difficult to support through these activities, though well written questions combined with images and other media could make the quiz tool effective in many disciplines. While *Hot Potatoes* can easily be used by those with little or even no Web development skills, it is useful to be able to modify the HTML files directly in some cases. For example, the instructions were not always sufficient for some of the activities, and the evaluator chose to modify the pages produced so that students could understand better how to work through the activity. Some knowledge of HTML is also helpful in integrating the finished activities into a complete website. *Hot Potatoes* is not freeware, but is free for personal and educational uses. Free registration is required to access all the product's functions, and the full use of some features – e.g., *the Masher*, requires a purchased license.

## Summary

*Hot Potatoes* is an easy way to create interactive activities, but more useful for some learning objectives than others.

## 3. Course Development and Presentation Tools

*Course Creation Toolkit 4.0* is designed to enable non-technical subject-matter experts and course developers to create quality online training materials as easily and efficiently as possible. The users enters information manually, cutting-and-pasting from other sources, and building a “lesson” by linking to a variety of media files. Interactive questions can be placed throughout any lesson, allowing learners to check their understanding and to receive feedback. The same tools can be used to produce tests and surveys. Learners work through the material in a linear fashion using “next” and “back” links, and can also access pages directly through the menu. All lessons and tests can be configured to work with a learning management system (LMS), to track learner progress and performance.

In the test, a short lesson was produced from existing materials including *Word* documents and *PowerPoint* presentations. Text pasted from *Word* retained most of its original formatting, though adjustments were necessary to fix spacing and to delete various code characters. It is easier to paste unformatted text and to use the product's own tools to adjust its appearance. It was also not possible to paste graphics from a *Word* document. They had to be saved first as graphic files and then inserted into the material. An inserted link to a *PowerPoint* presentation worked smoothly, opening and playing it in a new browser window. Creating test questions was simple, with both multiple-choice and short answer types. No problem was encountered in installing and



uninstalling the demo version of the program. Some problems were experienced in moving the finished lesson to a Web server, as some links remained absolute, continuing to point to files on the hard drive rather than in the Web directory. The link to the *PowerPoint* presentation ceased to work once moved to the Web, and at the time of writing, this problem remains unsolved.

While *Course Creation Toolkit* is fairly simple to learn and offers a good range of features, it is also somewhat rigid in its course design strategy, and does not allow the creation of interactive materials beyond test questions. Dynamic content must be created using another appropriate program (*PowerPoint*, *Flash*, etc.) and then inserted into the lesson. For this reason, novice users may tend to create electronic “page turners” with little advantage over the printed text. The user interface and online help are adequate. Despite these limitations, *Course Creation Toolkit* is a simple, non-threatening way for educators to transfer a variety of content online, without the need for technical training.

## Summary

*Course Creation Toolkit 4.0* is an effective, low-cost solution for those who do not require advanced features and flexibility.

***KnowledgePresenter*** is a comprehensive tool for creating dynamic, interactive, online content such as: multimedia lessons, both self-running and interactive; software simulations and demonstrations; and multiple-choice quizzes. All content plays in the browser and can be viewed on many platforms. The version reviewed here was *KnowledgePresenter Pro*, including the full feature set, separate programs for screen movie capture (*ScreenTeacher*), still-screen capture (*KookaCap 2004*) and a learning management system. It is a professional-level tool and carries a high price tag. With the product’s power and flexibility comes a certain degree of complexity. At first, its huge range of features and possibilities can be quite overwhelming. Fortunately, the software contains a user-friendly interface, a set of wizards and templates, and a complete set of tutorials and exercises to get new users up-to-speed. Once past the substantial initial learning curve, the program proved fairly easy to use for simple tasks. The basic design of *KnowledgePresenter* is similar to that of MS *PowerPoint*, with separate screens for each stage of the presentation, each containing a variety of text, graphics, video, or other media objects. The many export options (Web, pocket PC, animated .gif, *Windows* video, etc.) provide great flexibility of delivery. The demo version installed and uninstalled without incident, though it made heavy demands on the test system, causing it to “hang” occasionally. While the product does not require users have a technical background, they must be willing to invest some effort in becoming proficient with it in order to realize its potential. Previous experience with multimedia and Web development concepts would be helpful. The product is likely to appeal to institutional users in need of a solution that can efficiently and consistently produce quality online materials, but is simple enough for motivated instructors and course developers to use.

## Summary

*KnowledgePresenter* is a powerful tool for a quality product – with a price to match.

## 4. General Presentation Tools

***Powerbullet*** is a layout tool for creating Web-based electronic brochures and slideshows. It generates *Shockwave Flash* (SWF) files that can played back with the *Flash Player* or in a webpage. The program is similar in concept to MS *PowerPoint*, though is designed specifically to create animated, self-running, Web-delivered presentations. The rather cluttered interface allows

the user to import a variety of objects (text, graphics, mp3 files, etc.) and to apply animation and timing to each object in synchronizing the presentation. In the current test, it was possible to create a simple presentation almost immediately, as the basic operations are much like those found in similar programs. This was fortunate, as online help for the product is limited. The exported *Shockwave* presentation played back well in a browser, and the stand-alone executable version was much smoother in the *Flash Player*. A series of technical problems was encountered with the program on the test system. When a sound clip (mp3) was added to the presentation, it played back poorly in a browser (jerky, stuttering sound and video), though it still worked well in the *Flash Player*. In addition, the program crashed a few times while exporting the presentation, and occasionally text was omitted from the exported *Shockwave* file. It was noted that the *Powerbullet* support forum lists similar problems, most posted by *Windows 98* users, so the product may run more smoothly on more recent systems. It has received excellent reviews elsewhere (e.g., <http://www.snapfiles.com/>).

## Summary

*Powerbullet* is a great concept, easy to use, and FREE, but possibly “buggy” on certain systems.

## 5. Testing and Assessment Tools

*ExamView* is a test development and publishing tool designed to improve the efficiency of the assessment process. It allows users to develop test item banks that can then be organized into different individual tests. The specialized interface allows the development and formatting of tests more quickly than is possible with a word processor. In addition, tests and study guides may be published on the Internet or on an organization’s local network, for uses including automated marking and reporting of student results. Publisher-prepared *ExamView* test banks are available for over 2,000 high school and post-secondary textbooks. The program installed and uninstalled easily on the test system. Using the wizard interface, it was to produce a multiple-choice and true/false test in a few minutes. Exporting the exam for use on the Web was also simple, requiring only a few mouse clicks. Writing custom test items required more work, but was simpler than using a standard word processor to write and format a test. Complex math equations were easily formatted after only a few minutes of practice with the equation editor. Inserting media files into questions was also simple, and allowed the production of online tests that ask students to answer questions about a short video clip. Once new questions are created, they can be tagged with metadata (descriptive keywords, etc.), and stored as a part of a new test bank. In this way, questions can be searched, sorted, and reused for different tests and study guides over time, to make efficient use of resources. The product includes effective help files. Overall, the evaluator concluded that *ExamView*’s potential for improved efficiency and delivery of assessments more than justifies its cost. Summary: A time saving, professional quality assessment tool at a reasonable price.

## Conclusion

The current range of high-quality digital authoring tools offers great potential for improved efficiency in education, by allowing instructors, subject-matter experts, and others to undertake online learning projects with only limited support from information technology support staff.

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The next report in the series discusses the development of online learning communities.

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August – 2004

## **Technical Evaluation Report**

# ***34: Growing Virtual Communities***

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### **Abstract**

As online collaborative technologies become easier to use, an increasing range of “virtual communities” are being established, often for educational purposes. This report stresses that an efficient technology is only part of the process underlying a successful online community. It considers the social process on which an online learning community must be founded if it is to flourish and be useful. Definitions of community, learning community, and virtual learning community are reviewed, and the experience of an online community member is discussed. The importance of nurturing the community’s health, and the natural life cycle of a virtual community, are examined.

### **Growing Virtual Learning Communities**

Too often the assumption is made that simply by putting online technology into place for people to use, we have “built” a virtual learning community. We cannot assume that a learning community will naturally grow from a virtual learning environment, however (Schwier, 2002). Social factors are the key to nurturing or growing a learning community, online as well as face-to-face. It is important to understand these factors, because they can create barriers to the community’s growth.

The Merriam-Webster Dictionary (2004) defines community as “people with common interests living in a particular area,” or as “a body of persons of common and especially professional interests scattered through a larger society (such as the academic community).” When we speak of community, we refer to people who have come together physically or by another means, because they have something in common, which has brought them together. Community is more than just a shared purpose. When people come together, they naturally engage each other in a social network of relationships (Preece, 2000), comprising shared activities and social interaction. Community is a “place where people conduct community activities, share common beliefs, and share a means of communicating” (Brooks, 1997; Corry and Tu, 2002). Community “takes place within social interaction about common interests” (Galbraith, 1995; Corry and Tu, 2002). Without social interaction, there would be no community. Bellah (in Rovai, 2002) adds that, “. . . these types of community are not “quickly formed.” Community, therefore, comprises people who share something in common; who interact with each other in a physical space or through a shared identity; who are committed to the community through regular participation (to varying degrees); and who show reciprocity and trust.

The definition of an online or *virtual community* does not differ significantly from that of a physical community, though its implementation is different. The community builder needs to compensate for the lack of a physical space in which its members will interact. The space and the types of interaction most important to the community must be deliberately constructed. This process will depend on the type of community that is to be built, and its purpose. According to Preece (2000):

An online community consists of people who interact socially as they strive to satisfy their own needs or perform special roles; a shared purpose that provides a reason for the community; policies that guide people's interactions; and computer systems to support and mediate social interaction and facilitate a sense of togetherness.

Preece's definition contains many elements of 'community,' with the addition of a technology capable of supporting the community and enabling it to function; for it does not exist in a shared physical space, and its members may also be separated by time. Simple online community infrastructures facilitate basic communication and interaction functions, while more advanced technologies allow their users to create a virtual place where they can create new identities and environments to explore. Without the technology infrastructure, a virtual community cannot exist in any form.

Kowch and Schwier (1997) provide a definition of learning communities as:

. . . collections of individuals who are bound together by natural will and a set of shared ideas and ideals . . . (depending) on autonomous, independent individuals engaged by influencing each other within the learning process.

To be a *learning community*, participants must be committed to the learning process, and responsive to the contributions of other participants through "reciprocity" based on trust between the community members. Trust is based on credibility (i.e., another's word can be relied on) and benevolence, the extent to which "learners are genuinely interested in the welfare of other members" (Rovai, 2002).

Growing a *virtual learning community* therefore requires that we understand and embrace the social aspects critical to learners as they engage (and influence) each other across time and space. "A community . . . has clear boundaries that determine membership . . . (K)nowing the purpose of a community and sharing it clearly also helps to deter casual visitors who lack commitment (Preece, 2000). In addition to communicating its "culture, value, and context," a community needs to build a common history through shared experiences, and its members need to share their own personal histories and experiences. A shared history contributes to the community's sense of identity, and this forges a sense of who belongs to the community, and who does not (Schwier, 2002). The acquisition of knowledge through community activities is grounded in our experiences and constantly changes as we synthesize new information and generate new meanings. Anderson and Kanuka (1998) provide a social constructivist view of the process: "Knowledge is generated through social interaction." Schwier (2002) stresses that a strong connection (mutuality) leads to shared values which, in turn, lead to new knowledge and learning. A community can provide social interaction and relationships, both necessary for building new knowledge.

Gunawardena (in Anderson and Kanuka, 1998) theorized that active construction of knowledge moves through five phases: sharing and comparing information, discovery and exploration, negotiation of meaning, testing and modification, and summarizing and application of new

knowledge. Schwier (2002) adds plurality (bringing in ideas and relationships from outside the community); autonomy (respect for individual opinions, reaching group consensus, and a process for discourse); and future orientation (“visioning” how they will learn and apply that learning to the real world). This process of knowledge construction depends upon the nature of the community of learners, and needs to be supported by the virtual learning environment in which that community exists.

## **Experiencing a Virtual Community**

Brown (2001) points out that the ability to define community is often a “predictor of whether or not the student felt a part of the community” and that helping students to define community early on in the process may create a “perceived need that students will want to fill.” Community is a difficult concept for some students in virtual learning environments to define, especially if they do not believe that it relates to their online course needs. A community does not evolve in an online educational situation unless the participants want it to do so. It is present for some participants and not for others. Students who reported that they experienced “community,” and could define what it meant in their online courses, also reported a perceived satisfaction with their learning experience (Brown, 2001; Rovai, 2002). In addition, a strong sense of community is associated with an increase in persistence, flow of information, availability of support, commitment to group goals, cooperation, and general satisfaction (Rovai, 2002).

It might be expected that repeated experiences in online courses, and long-term associations with fellow students will help learners to define community and to develop a sense of community. Conrad (2002), however, found that many learners lacked a basic concept of community, even though they had been through several online courses: learners “just beginning online classes were not concerned with the existence or building of community . . . “ Why do all students not develop a sense of community in online courses? Brown (2001) identifies several explanations. Students may have no wish to be part of a community, or it may not be required of them; they may enroll in a course on the basis of knowledge goals, not community goals. The class may not be a high priority for them. Barriers may create an “out of synch” community experience. Or their definitions of community may not make it possible to experience it in an online environment. Some of these issues may be overcome through better preparation of students for online learning, or by finding ways to help reduce barriers between them.

We should be concerned, however, for students who do not make community connections despite their wish to do so. Although weak ties within a community are easy to maintain and can “be important for obtaining information, making new contact, raising awareness of new ideas” (Preece, 2000), they do not permit the creation of new knowledge through shared experiences and social interaction. Ways must be found to ensure that all learners have the opportunity to understand the importance of community in the virtual learning environment, and to experience it at the highest possible level. This may be achieved by heightening the students’ sense of membership and group belonging (Rovai, 2002). The importance of a sense of belonging to the community, at least during the early stages of its development, is that it helps to sustain individuals in their learning and validates their own experience (Haythornthwaite, Kazmer, Robins, and Shoemaker, 2000). Brown (2001) found that “membership . . . was conferred by others through feelings of worthiness and acceptance . . . that occurred following participation in long threaded discussions . . . and based on the quality of the participant’s input.” Other factors noted by Brown as contributing to the perception of a person’s membership in the community were: timeliness, supportiveness, virtual personality, perceived intelligence, commitment, and writing ability. None of these factors is immediately apparent when a person joins the community. Learners need time to become socially engaged with each other, so that they can

“move from a stressful position of isolation to confident membership” (Haythornthwaite et al., 2000).

Membership is also about who does *not* belong to the community – who is “outside” as well as “inside.” As learners begin a distance education program, they distinguish between those inside and outside their immediate learning community (Haythornthwaite et al., 2000). The process of identifying membership can be a barrier to perceived membership in the community for those who arrive late in the process and those who come in and out of it. Haythornthwaite and colleagues found that “as the cohort dissipates . . . so does their attachment to the community.” The introduction of new members and the loss of old friends reduces the attachment members feel to the community, especially as they engage in the outside world, and progress through the program ahead of/ behind others in their cohort.

Instructors/ facilitators play a variety of roles in shaping online groups and promoting a sense of community (Rovai, 2002). “Modeling, encouragement, and participation by the instructor” help a community to form more readily for more students (Brown, 2001). These roles and behaviors change as the community evolves through its various stages. If the community’s goal is to develop active learners, “. . . the facilitator will need to take a leadership role early in the process, promoting a change of mindset (and helping) learners break out of their stereotypical roles of information receivers into roles of information seekers . . .” (Prester and Moller, 2001). Communication, which includes interaction, engagement, and alignment, is the “brick and mortar of virtual communities” (Schwier, 2002), and is central to the notion of building learning communities (Kowch and Schwier, 1997). Richardson and Swan (2003) indicate that students’ perception of “social presence” in a virtual community can be a predictor of their perceived learning within it. Social presence is the “degree to which a person is perceived as ‘real’ in mediated communication . . . and is a factor of both the medium and the communicators’ perceptions of presence . . .” (Richardson and Swan, 2003). It affects how participants sense emotion, intimacy, and immediacy (Preece, 2000).

Social interaction can have a positive or negative influence on community; and the sense of community is not always altruistic. Students may or may not perceive that it is in their best interests to create and maintain community in order to achieve harmony in the course and amongst their peers with whom they may work with again in later courses (Conrad, 2002). Long-term association can help to promote community (Brown, 2001), but it can also potentially discourage the evolution of community if students view the process as a business transaction (Conrad, 2002), rather than as an important part of their learning process. Haythornthwaite and colleagues (2000) indicate that some students may view computer-mediated communication postings as a chore requiring much work, while others may find that online socializing “eases work relations.” Reduced social cues in a virtual community may allow some students to feel free to ask “stupid” questions, avoiding potential negative facial responses, while others “fade back” and fail to contribute to the community. Also, as students progress through a class and master the technologies and processes, their need for social contact may diminish.

## **The Life Cycle of a Virtual Learning Community**

It is useful to consider the typical life cycles or stages of a virtual learning community. This helps to identify the points at which intervention may be needed (or should be removed) in the interests of the community’s development. The levels of engagement between the community’s members increase as each stage is reached, except for the last stage where engagement ends (Brown, 2001); and we can consider where communication and interaction may be key to the community’s sustenance. The following analysis uses Schwier’s (2002) terminology, adding two elements from Preece’s system (2000).

- **Pre-birth** is when the development, software, and policies of the community are established (Preece, 2000). In academic contexts, these elements are generally established before the community is formed. If the process is not directly connected to an academic organization, however, this stage may be the community's sole responsibility. Either way, the basic structure and operation of the community will affect later stages of the community's development.
- **Formative:** during the formative stage, new members are brought into the community and the community's identity develops (Schwier, 2002). New acquaintances are made, similarities between members are identified, and communication is recurrent (Brown, 2001). This is the point at which the community needs nurturing (Preece, 2000). In a text-based online context, community conferment takes place via threaded discussions, and helps to establish community kinship (Brown, 2001).
- **Maturity** occurs when the community begins to function independently of direct guidance (Preece, 2000). The purpose, shape, and operations have been settled, and there is a less central role for the facilitator (Schwier, 2002). Camaraderie may be established through long-term and/ or intense associations (Brown, 2001).
- **Metamorphosis:** for Schwier (2002), this stage occurs when the community becomes something that it originally was not. Some members may resist this change and attempt to prevent it. For some communities, a natural decline, leading to death, may be best option for the community at this stage (Schwier, 2001).
- **Death** is the final stage of a virtual learning community, when members leave, discussion slows to the point that there is not enough participation to motivate them to return, and/ or the community has served its purpose (Preece, 2000). The death of an online community may be natural, as for example at the end of an online course, or unnatural, as when a community tries to continue with no set purpose.

## Conclusion

As we design and implement virtual learning processes in distance education, considering the meaning of community is important. Social factors are central to the planning, nurturing, and life cycle of learning communities. Participation, communication, and interaction are at their heart. A community's focus needs to be clear so that its members can build a common history and identity. Cooperation, trust, and reciprocity are required, so that the community can fulfill its goal of knowledge acquisition grounded in experience. A sense of belonging and social presence sustains participants through the learning process. Virtual learning communities face the additional challenge of connecting people over time and space through the use of technology. Students may not always be able to define a virtual learning community in a way that allows them to participate and benefit from it. The instructor/ facilitator must play an adaptive role in the community process, developing active and engaged learners. All of these social factors influence the life cycle of a virtual learning community, eventually leading it to a higher stage, or to decline and death, natural or not.

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The next report in the series discusses the development of an online community advocacy group.

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## **Technical Evaluation Report**

# ***35: Synchronous Conferencing by a Community Advocacy Group***

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### **Abstract**

The previous report in this series discussed how collaborative tools can be used in the development of formal and non-formal online communities. The current report describes the specific development of an online community advocacy group.

### **Developing an Online Community**

The previous report in this series (#34: Garber, 2004) has shown that social factors play “a critical role in the planning, nurture, and life cycle of virtual learning communities”: a common purpose; a clearly communicated identity defining members and non-members; a shared history; trust and respect; communication and participation. Garber identifies communication and participation as crucial during the formative stages of the community. It is through participation that group members develop a sense of belonging. In the case of a non-formal community-based group, all these factors may be even greater than usual, since there is no tightly defined cohort as in, for example, a formal online classroom setting. Advocacy group members engage in activities that bring people together – acting as a unit to write letters of protest and collaborating on projects – via the same collaborative learning group model found in adult learning for social justice (Cranton, 1998). At face value, synchronous audio-conferencing lends itself to these pursuits well. Jegede, Gooley and Towers (1996) state that high computer literacy is not important for synchronous online discussion; and the type of communication it generates is usually transparent and open. The current group's members contribute to email and listserv discussions on a purely voluntary basis, however. Will the synchronous conference method enhance their ability to participate and increase their sense of belonging to the group?

### **The Community Advocacy Context**

The advocacy group's members are parents of children in the public education system in Vancouver, Canada, from diverse socio-economic backgrounds and education levels. They share a motivation, based on their observation and experience in local schools, to force change in British Columbia's provincial education funding policy. Group functions are distributing information, raising awareness, eliciting response, seeking expert information, collaborating on letters and briefs, and networking with other groups in the province and organizing events. The group's usual communication methods included a website, telephone, email and face-to-face

meetings, but these methods had not proved sufficient for sustaining real effectiveness. One member (the writer), with experience in using *Yahoo Messenger (YM)* audio-conferencing in a formal education setting, promoted its use to the group, as a means of facilitating communication. Acting as coordinator, the writer invited the group to commit to two conferences, so as to decide if the *YM* conferencing tool would be useful in its future work. The problems of scheduling meetings involving people with family, professional, and other commitments responsibilities proved ample motivation for the group to test the audio-conferencing suggestion.

Helpful conferencing strategies were found in the “best practices” literature of synchronous audio-conferencing (*see previous reports in this series*). It was decided to set a limit of no more than 15 – 20 participants. Background materials were sent in advance; the importance of eliciting, accepting and adjusting to feedback in the absence of visual cues was recognized, together with the importance of the moderator’s role, the need to delegate moderating duties, and the importance of debriefing. Robinson (in Bates, 1995 p. 129) found that synchronous audio-conferencing was generally effective for discussing mutual problems and negotiating group project work, but not for lecturing, impromptu tutorials, or unprepared topics, or for groups with constantly changing memberships. Although the advocacy group’s conferences would be fairly impromptu, their immediate purpose would dictate the conferences’ structure. It was thought possible that, with experience, the group would develop its own internal structures to deal with conferencing functions – e.g., in session reporting, collaborative preparation of statements, organizing of events, problem-solving, and networking.

## **Running the Audio-Conferences**

To explain the use of the *YM* conferencing tool to the advocacy group, concrete examples of online conferencing in other areas were given. The coordinator proposed possible uses of the method, compared *YM* tool’s features to those of other applications, and gave a realistic outline of time, cost (purchase of headsets), and technical requirements. Once the group had agreed to test *YM*, an informal technical survey was conducted by “phone and email, and a reference chart of the members” technical facilities was prepared for the purpose of troubleshooting. These urban parents all owned computers and have Internet access. Only one had a PC with less than 256Mb RAM and used a dial-up Internet connection. Clear, one-page instructions were sent to them on how to download *YM*, to create an ID, to submit the ID to the coordinator, and to test the headsets. A brief description of how the first session would proceed was included. The effort was made to carry out participant trials before the first group meeting.

### **First conference: "the best laid plans . . ."**

The purposes of the inaugural conference were to raise participant comfort level, to become familiar with the protocol, and to permit some meaningful reporting of the group’s projects. Unfortunately, the conference was impeded by a flu epidemic and a political leadership convention, both on the same day. Six members had intended to participate, but only three actually did so, two with voice and text, and one with text only. The lack of intrinsic motivation often provided in formal education may have increased the gap between enthusiasts with some experience of the conferencing technology and those who were less familiar with it and less “convinced” of its benefits. The non-participating members had failed to complete the necessary pre-conference preparations. Although the coordinator had provided information and encouragement during the two weeks prior to the conference, two members of the group did not download the *YM* software nor set up an ID. Their attempt to do this at the last minute was stressful and unsuccessful. One would-be participant’s computer crashed twice (it had only 64Mb RAM), and another had a problem with *YM*’s pop-up displays. Another participant, the only one using a Macintosh machine, found that *YM*’s voice features are restricted on Macs. This participant participated in the conference in the text box only.

Remarkably, some substantive work was done. The voice participants were able to experiment with the *YM* conferencing tool and traded ideas on moderating technique – thereby creating two potential group moderators. Most, but not all, of the voice interaction was summarized in the text box for the benefit of the Mac participant. This text-only participant quickly adapted to “pauses” in text chat and showed leadership in searching out pertinent supporting information (quotes, pieces of reports, references) and pasting them into the textbox, while the voice participants negotiated a response to be presented for feedback. Reporting and action planning took place on two issues, an agenda for the next meeting was proposed, and strategy for a coming event was agreed. Overall, the interaction by *YM* audio-conference was perceived as useful. Even the participant restricted to text gamely remarked: “This will also seem very cute in 20 years or so when we just ‘mind meld’ or something.”

### **Second conference: "more than meets the eye . . . "**

Five of the six target members took part in the second conference. The three who took part in the first had a clear fluency advantage over the two new participants. Technical problems were still experienced. One new participant could hear everyone but could not be heard, so gave input via the text box only. The Mac user continued to take part via text only, but performed helpful text-based functions in lieu of participating in the full voice discussions. The sixth member had experienced *YM* loading problems prior to the first conference, had unexpected demands on time, and opted out.

The work done in the second conference was considerable. A length of 45 minutes and an end time were negotiated at the beginning. A review of conference protocol and strategies took about five minutes. The moderator cut-and-pasted items from a prepared *Word* document (protocol items, suggested agenda, numbered items) throughout the conference. Also, a customized moderator emote.dat file was used for conference management functions (*to be explained in an upcoming report in this series*). A second moderator helped to deal with user problems, such as inviting participants back in if they were accidentally “kicked out.” Reports were given and discussed. A recent event and its implications to the organization were discussed and a response was written. Some actions were revamped and redirected. A new idea sparked the organization of a specific action, and responsibility for it was designated. The need for a face-to-face meeting three weeks hence was identified and a location and time were negotiated. Response to an informal survey circulated after the second conference indicated that the *YM* tool, even with its occasional technical problems, was “somewhat useful” in the group’s work, and that if all the technical problems could be ironed out and all participants could hear and speak, it would be “definitely useful.” It was decided that *YM* conferences should not affect the number of face-to-face meetings, but should be called “as needed” – e.g., if people were to be unavailable for regular meetings. The role of *YM* conferencing was seen as being most useful in the organization of events, which had been a specific achievement of the second conference.

## **Conclusions**

Synchronous audio tools are potentially useful in extending access to participation in non-formal community education. In unstructured contexts, control of technology use is not in the hands of instructional or technical experts, but depends on the existing group processes. The collective development of group skill occurs at its own pace. Successful use of synchronous audio conferencing depends on the group’s motivation and the technology’s perceived relevance. The more success that is built into the introductory conference, the more quickly a synchronous conference tool can be accepted and used effectively. Building in a feedback system via informal inquiry or a participant survey helps to keep the purpose of the conferences relevant and useful. Participants need to see a direct tie from conference to action. The participant technical survey is

a crucial aspect of conference organization, and a thorough investigation of the chosen software's ability to function on participants' systems must be completed before conferences are held. A testing of ID, connections, and microphone must occur prior to the introductory conference. The most experienced group members should guide the least experienced in the process of developing group expertise through hands-on use.

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