# INTERNATIONAL JOURNAL

## OF

# INSTRUCTIONAL TECHNOLOGY

## AND

# DISTANCE LEARNING

## International Journal of Instructional Technology & Distance Learning

**Vol. 3. No. 8.**

# Table of Contents – August 2006

**Editorial**

# Mature Technology

Reliable and ubiquitous technology enables distance educators to focus on communication and learning. Myths and concerns about inferiority of distance learning have been disproven and dispelled. The relationship between on-campus and distance learning programs is blurred as faculties adopt internet and tools initially developed for distance learning for their on-campus classes. Concerns about quality, academic standards, and lack of face-to-face communication are giving way to enthusiasm for the influx of mid- career professionals that enrich distance learning classes and programs. There is also a global dimension that provides cultural richness and higher benchmarks for quality.

Interactive multimedia and learning management systems transform the distance learning landscape. Instructors focus on course development, tutorials and dialog rather than lecture and "covering curriculum". Students fit learning into their life space so that professional and family activities are not compromised by the desire for continuing education. Flexibility does not compromise quality, and emphasis is on customization rather than regimentation.

Many constructs of traditional education are irrelevant with distance learning. This is especially true of management devices such as fixed curriculum, fixed schedules, and fixed deadlines for assignments. Punitive and militaristic devices to "motivate" or "manage" student behavior are replaced by assigning to each student responsibility for his or her learning.

Similarly, it is no longer necessary to proliferate courses to meet a spectrum of needs, subject matters, and academic levels; it is possible to customize courses, course modules, and learning objects to meet the needs of each individual student. A combination of technologies make this possible including advanced assessment tools, criterion referenced objectives, rubrics, interactive multimedia, and learning management systems.

Course materials can be continuously updated based on feedback from instructors and learners resulting in continuous quality improvement. It is no longer necessary to wait for the new edition of an expensive textbook because content is delivered inexpensively on the web. For the moment, this is not yet a threat to the publishing industry because so many distance learning courses are textbook based. Also, publishers have introduced substantial CD and web components to facilitate adaptation to the needs of different teachers and learners.

The dichotomy between classroom and distance learning has given way to blended learning where the distance component can vary from 0 to 100% based on learning objectives, subject matter, learner needs, and logistics of delivery including proximity to education institutions and ability to fit their schedules.

With the coming of age of distance learning, academia can redirect its attention to mission, relevance, and competing in a global learning economy. There will always be traditional on-campus programs for those who can attend, and explosive growth will continue in quality learning opportunities through distance education. Global access to computers and the internet, a ubiquitous interface, and widespread acceptance by education stake holders at all levels ensure make distance learning the focus of innovations in teaching and learning.

**Editor's Note**:  As distance learning spreads to all parts of the globe, it stimulates research to determine acceptance and ways to make it more effective. Online learning is becoming pervasive across barriers of language and culture, age and disability, geography and distance from population centers. Great centers of commerce such as Hong Kong now benefit from distance learning to enable "education for all."

# Perceptions of Students on Online Distance Learning in Hong Kong

## Harrison Hao Yang and Fung Chun Lau

## Hong Kong

## Abstract

The Open University of Hong Kong (OUHK) is the first higher education institute introducing distance education in Hong Kong, and has been playing the central role on online distance learning in that region. This study reports the overview on the perceptions of students on online distance learning at OUHK. It intends to offer a glimpse into students who enrolled in two different online courses ($n = 64$) with the objective of investigating their views and opinions related to the Online Learning Environment (OLE) and the Interwise system, which are mainly used asynchronously and synchronously for teaching and learning, respectively. The Online Distance Learning Questionnaire Form is developed for this study, and a comparison between two courses on the OLE is conducted. Conclusion and discussion of online distance learning at OUHK are provided.

**Keywords**: perceptions; online learning; distance education; asynchronous and synchronous communication

## Introduction

Online distance learning represents a new paradigm which deeply affects education in general. Many of the traditional face-to-face classroom activities can be reconstructed through web-based distance learning such as conferencing, electronic mail, and bulletin. Students and instructors can work at their own pace and at locations they are able to control (Edelson, 1998; Berge, 1999; Spiceland & Hawkins, 2002).

Asynchronous communication has been recognized more common than synchronous communication for online distance learning (Jonassen, 2000). There are two noteworthy advantages of asynchronous learning: first, it makes the convenience and flexibility offered by the "anytime, anywhere" accessibility (Richardson & Swan, 2003); second, "it allows students to reflect upon the materials and their responses before responding, unlike traditional classrooms" (Richardson & Swan, 2003).

Synchronous learning, on the other hand, has some of unique advantages, such as: "sense of immediacy is compelling. Live interactions produce more motivation to contribute" (Jonassen, 2000). One way or another, online distance learning has been widely used by institutions around the world. The Open University of Hong Kong (OUHK) is the only higher education provider to students with distance learning mode for every program in Hong Kong. OUHK believes that every aspiring adult should be given a chance to get higher education. With the philosophy of "education for all", the university admits any Hong Kong resident aged 17 or above. The students are pursuing their studies by part-time genre in distance education. The Online Learning Environment is the first online system which has been developed for delivering online courses asynchronously by OUHK. In addition, a newly developed synchronous learning system Interwise has been employed for supporting online teaching and learning since April 2005.

While online distance learning programs are expanding, and participants are mounting globally, the question of how effectively to design and conduct online courses to students who are physically and/or timely separated from each other has been raised (Palloff and Pratt, 1999; Rovai, 2002; Yang & Maina, 2004). Such separation may increase social insecurities, communication anxieties, and feelings of disconnectedness (Kerka, 1996; Jonassen, 2000), as a result, "the student become autonomous and isolated, procrastinate, and eventually drops out" (Sherry, 1996). Previous studies suggest that successful online courses relate to interactivity, sense of well-being, quality of the learning experience, and effective learning (Rourke, Anderson, Garrison, and Archer, 2001; Rovai, 2002).

In order to identify the factors which attribute to the success of online courses, researchers believe that students' perceptions of distance learning program is a prime area where should be focused on (Richardson & Swan, 2003; Rourke, Anderson, Garrison, and Archer, 2001). It is well documented about students' perceptions of online distance learning in general (Romiszowski & de Haas, 1989; Romiszowski & Jost, 1989; Allen, Bourhis, Burrell, & Mabry, 2002; Picciano, 2002; Richardson & Swan, 2003; Yang & Maina, 2004).

There are sufficient studies examining on one online environment and/or comparing that to traditional face-to-face class, little is done on systematically and authentically investigating students' perceptions on online distance leaning with more than one online environments and courses. This study intends to investigate views and opinions from students of two online courses at OUHK using the Online Learning Environment and the Interwise system, which are mainly used asynchronously and synchronously for teaching and learning, respectively.

## Online Learning Environment and the Interwise System

The Online Learning Environment (OLE) is the first online system developed by the Open University of Hong Kong for delivery of the university's online courses asynchronously. The OLE contains the online platform which consists of five major areas for the online course: news, schedules, interactive tools, course materials, and assignments (see Figure 1). In this online learning platform, users (students, tutors and the course coordinators) can post their questions, answers, and ideas or opinions on the discussion board of each module. Students can submit their learning assignments and materials electronically. Besides, users can get emails and send out any message to others privately or publicly (see Figure 2).
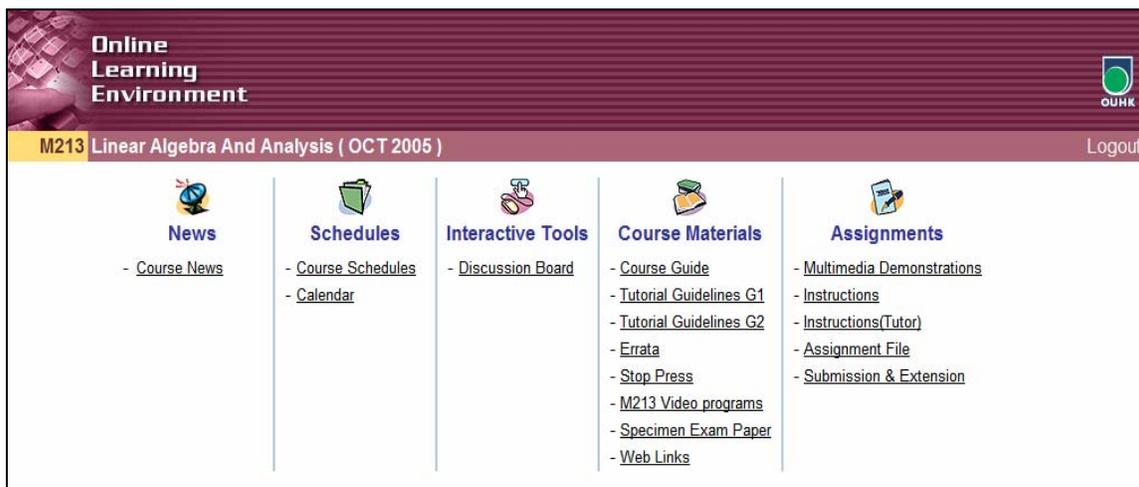


**Figure 1. Course Map of Online Learning Environment**

**Figure 2. Individual Platform of Online Learning Environment**

Other than the provision of the OLE, OUHK launched its newly developed Interwise system starting April 2005. The Interwise is a live and interactive distance learning system (see Figure 3). In the Interwise system, the students can join in the i-Classes which are scheduled by the tutors or course coordinators at any place. They can synchronously view whatever the tutors and coordinators are doing on the Whiteboard; converse and exchange notes with others; answer verbal questions and respond to the structured questions; record a live lesson, and play back live or pre-recorded lessons; etc. The Interwise environment enables the tutors and course coordinators to emphasize verbal instruction; to use a Whiteboard for displaying of learning materials; to operate the fully-monitored instruction during the "live" lessons; to ask questions and give tests, to conduct surveys and poll the students' responses; and to share an application with the class or an individual participant, etc (see Figure 4).



**Figure 3. Course Map of Interwise System**

**Figure 4. Screenshot of One i-Class in Interwise System**

## Method

### Design and Instrument

To measure students' perceptions of learning on online distance education at OUHK, and to preserve anonymity and voluntariness, an inclusive questionnaire was developed based upon two perspectives. On one hand, items were extracted and adapted from previous related studies, and the students' survey on the usage of OLE at OUHK. On the other hand, the interview was conducted with a small sample of 8 students about perceptions of online education through their learning experiences at OUHK. During the interview, following questions were asked and discussed:

- What do you know about the Online Learning Environment?
- Do you enjoy using public forums such as the Discussion Board in the OLE?
- Do you find the communication easier among you, classmates, the tutors, and the course coordinators by using the OLE?
- Does the OLE give knowledge which makes you enjoy your learning more?
- Do you gain any knowledge or raise any concern from using the OLE system?
- Do you consider the course materials useful in your discussion?
- Do you consider the tutorials helpful for your understanding of the topics?
- What do you know about the recently introduced Interwise system?
- Have you participated in an i-Class in the Interwise system?
- Do you think that the Interwise system is an effective system to teach mathematics and/or statistics contents?

The final version of Online Distance Learning Questionnaire Form for the cross-sectional survey consisted of respondents' personal data and perceptions of Online Learning Environment, the OLE course, and the Interwise system.

## Participants and Procedure

The participants of this study were selected from students ($n = 78$) who enrolled two online courses *MDST242 Statistics in Society* (Course One) and *M213 Linear Algebra and Analysis* (Course Two) at OUHK in Spring 2005. Despite focusing on different subject areas, both courses had the similarities of course design and activities. Both courses shared the nature of using numerical data to understand patterns and relationships, and had been offered on the same difficulty level by OUHK. Most of participants in both courses were part-time students whose ages were in 20-30. In addition, one of researchers on this study was a tutor for both courses.

All 78 students received the Online Distance Learning Questionnaire Form, along with the information of explanation of this study and of how to complete the questionnaire survey form. Upon the deadline for completion of the questionnaire on March 12, 2006, 64 questionnaire forms were returned (Course One: $n = 34$; Course Two: $n = 30$), of which 64% were sent by male students and 36% were sent by female students, and all 64 forms were completed and usable. The return rate was 82%.

## Results

### Respondents' Perceptions on Online Learning Environment (OLE)

Most of the students (70%) from both courses agreed that in general, they were satisfied with the OLE. About 63% of the students indicated that it was very easy to access the OLE, and nearly the same amount of them agreed that they found online communication with tutors helpful for their studies. About 53% of the students indicated that it was always beneficial to know the standard of the work expected. About half of the students concurred that the interface of the OLE was well designed (52%), and the program required them to describe and analyze data (47%).

**Table 1**

**Comparison of the Frequency of Using OLE Features**

| Item | Course One ($n = 34$) | | Course Two ($n = 30$) | | $t$ |
|---|---|---|---|---|---|
| | $M$ | $SD$ | $M$ | $SD$ | |
| Checking News posted by the course coordinator | 2.35 | .49 | 1.97 | .61 | 2.81* |
| Reading online course materials | 1.94 | .69 | 2.13 | .35 | -1.43 |
| Reading messages posted on the Discussion Board | 2.38 | .60 | 2.57 | .50 | -1.32 |
| Posting messages on the Discussion Board | 1.74 | .67 | 1.88 | .65 | -.87 |
| Communicating with your tutor or other students using emails | 1.68 | .53 | 1.80 | .66 | -.82 |

\* $p < .05$.

In the comparison of the two courses, as indicated in Table 1, there were five items investigating on how frequently students used OLE features. Each item was on a scale of 1 to 3 with 3 being "often (4 times or more per week)", 2 being "sometimes (1-3 times per week)", and 1 being "none (0 times per week)". One notable difference was found between students in Course One (Statistics) and Course Two (Linear Algebra) on the frequency of checking "News" posted by the course coordinator. The mean for the 34 students in Course One was 2.35 ($SD$ = .49) while the mean for the 30 students in Course Two was 1.97 ($SD$ = .61). This difference was significant ($t$ = 2.81, $df$ = 62, $p$ < .007), which indicated that the students in Course One checked news which posted by the course coordinator much more times per week than the students in Course Two did.

**Table 2**

**Comparison of Perceptions on the OLE**

| Item | Course One ($n$ = 34) | | Course Two ($n$ = 30) | | $t$ |
|---|---|---|---|---|---|
| | $M$ | $SD$ | $M$ | $SD$ | |
| It is easy to access the OLE | 1.97 | .80 | 1.63 | .49 | 2.01* |
| The interface of the OLE is well designed | 2.38 | .85 | 1.93 | .74 | 2.24* |
| The immediate feedback for the online activities/exercises is useful and convenient | 2.44 | 1.02 | 2.23 | .73 | .93 |
| The information obtained via links is helpful to my study | 2.35 | .92 | 2.23 | .73 | .57 |
| The OLE makes communication with other students more convenient | 2.18 | .87 | 2.03 | .72 | .71 |
| Online communication with tutor is helpful for my study | 2.13 | .91 | 2.37 | .93 | -1.04 |
| It is convenient to submit my assignment via OLE | 2.38 | 1.48 | 2.77 | 1.17 | -1.15 |
| In general, I am satisfied with the OLE | 2.03 | .87 | 2.23 | .73 | -1.01 |

* $p$ < .05.

As indicated in Table 2, there were eight items investigating on how students perceived the Online Learning Environment. Each item was on a scale of 1 to 5 with 1 being "strongly agree" and 5 being "strongly disagree". Significant differences were found between students in Course One and Course Two on two items: "It is easy to access the OLE", and "The interface of the OLE is well designed". The mean for the students in Course One regarding the accessible of OLE was 1.97 ($SD$ = .80) while the mean for the students in Course Two on the same item was 1.63 ($SD$ = .49). This difference was significant ($t$ = 2.01, $df$ = 62, $p$ < .049), which indicated that the students in Course Two agreed more on "it is easy to access the OLE" than students in Course One did. The mean for the students in Course One regarding the design of OLE was 2.38 ($SD$ = .85) while the mean for the students in Course Two on the same item was 1.93 ($SD$ = .74). This difference was significant ($t$ = 2.24, $df$ = 62, $p$ < .029), which indicated that the students in Course Two agreed more on "the interface of the OLE is well designed" than the students in Course One did.

# Respondents' Perceptions on the OLE Course

Although most students (85%) from both courses preferred face-to-face tutorials other than online discussion board (Open Forum) in Online Learning Environment, the majority of them agreed that in general, they were satisfied with the OLE courses. About 80% of students indicated that they liked the OLE discussion board. Approximately 62% of students pointed out that the email feature for online communication with the tutor was very helpful.

In the comparison of the two courses, as indicated in Table 3, there were ten questions on the online course design and development. Students were asked to indicate what extent they thought on each question. Each question was on a scale of 1 to 5 with 1 being "not at all" and 5 being "very much". No significant differences were found between the students in Course One and Course Two on those questions.

**Table 3**

**Comparison of Perceptions on the OLE Course Design**

| Item | Course One (n = 34) | | Course Two (n = 30) | | t |
|---|---|---|---|---|---|
| | M | SD | M | SD | |
| Was the level of difficulty of the materials appropriate to the subjects matter content? | 2.97 | .76 | 3.20 | .81 | -1.17 |
| Was the presentation of the contents relevant to the course objective? | 3.85 | .74 | 3.87 | .68 | -.08 |
| How presentable and attractive do you find the course materials? | 3.38 | .60 | 3.60 | .67 | -1.36 |
| Were the course materials designed to be user-friendly? | 3.56 | .75 | 3.57 | .73 | -.04 |
| How satisfied were you with the quality of tuition / support you received from the tutors? | 3.65 | .73 | 3.60 | .67 | .27 |
| How well were you able to learn from your tutor's comments? | 3.76 | .70 | 3.70 | .60 | .40 |
| How much did the program require you to memorize facts / concepts? | 3.44 | .61 | 3.40 | .62 | .27 |
| How much did the program require you to understand facts / ideas? | 3.79 | .69 | 3.70 | .70 | .54 |
| How much did the program require you to apply learning to your own experience / life / job? | 2.85 | .70 | 3.00 | .74 | -.81 |
| How much did the program require you to analyze data / descriptions / arguments? | 3.44 | .82 | 3.27 | .91 | .81 |

As indicated in Table 4, there were nine items investigating on how students perceived their learning through the online course. Each item was on a scale of 1 to 5 with 1 being "strongly disagree" and 5 being "strongly agree". The item "Tutorials have helped my understanding of the topics covered in this course" had the highest means from both courses, followed by items "Tutorials were well integrated with the rest of the course", "The course sharpened my analytic skills", and "The course developed my problem-solving skills". Significant differences were found between students in Course One and Course Two on two items: "It was always beneficial to know the standard of work expected", and "The tutor of this course motivated me to do my best work". The mean for the students in Course One regarding the standard of work expected was 3.68 ($SD = .68$) while the mean for the students in Course Two on the same item was 3.03 ($SD = .93$). This difference was significant ($t = 3.18$, $df = 62$, $p < .002$), which indicated that the students in Course One agreed more on "it was always beneficial to know the standard of work expected" than the students in Course Two did. The mean for the students in Course One regarding the motivation from the tutor on doing their work was 3.71 ($SD = .63$) while the mean for the students in Course Two on the same item was 3.37 ($SD = .49$). This difference was significant ($t = 2.38$, $df = 62$, $p < .020$), which indicated that the students in Course One agreed more on "the tutor of this course motivated me to do my best work" than the students in Course Two did.

**Table 4**

**Comparison of Perceptions on the OLE Course Learning**

| Item | Course One ($n = 34$) | | Course Two ($n = 30$) | | $t$ |
|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | |
| It was always beneficial to know the standard of work expected | 3.68 | .68 | 3.03 | .93 | 3.18* |
| The course developed my problem-solving skills | 3.56 | .70 | 3.60 | .50 | -.27 |
| The tutor of this course motivated me to do my best work | 3.71 | .63 | 3.37 | .49 | 2.38* |
| The workload was too heavy | 3.18 | .83 | 3.43 | .82 | -1.24 |
| The course sharpened my analytic skills | 3.68 | .73 | 3.80 | .41 | .85 |
| The course improved my skills in written communication | 3.18 | .80 | 3.37 | .81 | -.95 |
| Tutorials have helped my understanding of the topics covered in this course | 4.09 | .57 | 4.13 | .35 | -.38 |
| Tutorials were well integrated with the rest of the course | 3.76 | .61 | 3.70 | .47 | .47 |
| The tutor encouraged my interest in the course topics | 3.68 | .73 | 3.40 | .62 | 1.62 |

* $p < .05$.

## Respondents' Perceptions on the Interwise System

Approximately 86% of the students took part in the newly introduced Interwise section. Among of them, about 80% of the students agreed that the Interwise system was helpful to their studies, and about 78% of the students agreed that they could understand mostly what the tutor delivered in this Interwise system. About 85% of the students who attended the Interwise section indicated that they would continue to participate in it. The main reasons for 14% of the students who could not attend the Interwise section were the time conflict, computer hardware and/or software problem. All of the students who could not attend the Interwise section indicated that they would try to participate in it in the near future. Overall, about 82% of the students felt that the tutor could deliver the topic clearly to them by using the Interwise system.

# Discussion and Conclusion

The results of this study indicated that students perceived very positively on learning in asynchronous online environment. This result is consistent with the findings of previous research (Romiszowski & de Haas, 1989; Romiszowski & Jost, 1989; Allen, Bourhis, Burrell, & Mabry, 2002; Picciano, 2002; Richardson & Swan, 2003; Yang & Maina, 2004). Most of the students were satisfied with the usage of OLE. They felt that features in asynchronous online environment such as discussion board, email and tutorials were helpful and useful to their studies. Students from both courses strongly sensed that the OLE course had helped their understanding of the topics, sharpened their analytic skills, and developed their problem-solving skills.

Results revealed that there were significant differences between students' perceptions in two courses on: 1) the frequency of checking news posted by the course coordinator; 2) the accessibility of the OLE; 3) the design on the interface of the OLE; 4) the benefit of knowing the standard of work expected; and 5) the motivation from the tutor. It appeared that students who perceived more importance on knowing the standard of work expected were likely to check the news posted by course coordinator much more times per week than students who perceived less importance on knowing the standard of work expected were. Correspondingly, regarding to do their best work, students who perceived more importance on knowing the standard of work expected emphasized more importance on the motivation from tutor than students who perceived less importance on knowing the standard of work expected did. It was interesting to note that students who felt the greater easiness to access the OLE would also express the greater approval to the design on the interface of the OLE. Perhaps students' perceptions on the accessibility of online environment were a factor which influenced students' comfort, satisfaction, and preference on the design of course interface.

The fact that most students showed optimistically on the Interwise system for helping their studies should be of interest to program leaders, system designers, course coordinators, and tutors. Online distance learning through newly developed synchronous environment can transmit "live" data including audio, video, texts, files, screens, pictures, and shared applications (Jonassen, 2000). This type of online distance learning can be particularly helpful for delivering courses which involve demonstrations and discussions on patterns and relationships, hands-on activities, etc. Although results reveal that time conflict and technical difficulty are still remaining, the continuation of using synchronous system to support online distance learning with more flexible scheduling and appropriate training seems to be quite encouraging and promising.

One weakness in this study was the sampling. It should be noted that the sample size was relatively small. Furthermore, the participants were selected by the convenient sampling method since one of researchers for this study was a tutor of both courses for the time being. Hence, the results of this study might not represent larger populations' perceptions on learning in online distance education. This weakness should be controlled in future studies.

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## About the Authors

**Harrison Hao Yang**, Ed.D, is a professor of educational technology at the State University of New York at Oswego, and holds an adjunct professorship at The Chinese University of Hong Kong. E-mail: hyang2@oswego.edu


**Fung Chun Lau**, M.Sc., M.A. (I.T.Ed), is a tutor of Statistics and Mathematics courses at The Open University of Hong Kong, and is a postgraduate of M.A. (I.T. Ed) course at The Chinese University of Hong Kong. E-mail: laufc1326@yahoo.com.hk

**Editor's Note**: The computer offers logical options for testing that increase reliability and scalability for large numbers of learners in training and education environments.  Immediate feedback stimulates motivation and supports learning as Sydney Pressey discovered in 1925.  This article goes in depth into different kinds of computer assisted testing and feedback to support learning.

# Adaptive Feedback Characteristics in CAT

## Anastasios A. Economides

## Greece

## Abstract

Feedback is an essential element in learning. The educator (real or artificial) responds to the learner's actions, emotions, intentions, etc. in order to help her to become self-aware and improve. Recently, Computer Adaptive Testing (CAT) is gaining high popularity due to its efficiency in testing large number of examinees. This paper examines the attributes of Adaptive Feedback in CAT. Designers and developers of CAT systems may rely on these attributes to produce effective feedback adapted to the learner or the educational context.

**Keywords:** adaptive feedback, CAT, adaptive testing, cognition, affection, emotion, conation.

## Introduction

Many schools, organizations, licensing boards and states are currently using CAT (Computer Adaptive Testing) (Schaeffer et al., 1995, 1998; Dunkel, 1997; Wainer at al., 2000; Sri Krishna, 2001; Rudner, 2002; Di Challis, 2003). This growth of CAT will continue propelled by the huge number of applicants. The popularity of CAT is due to a number of reasons. It provides highly reliable and valid results. The learner can take the test at her pace, and receive her score immediately. She can be challenged, but not discouraged or get bored by the presentation of questions that are far above or below her ability level. The cheating is restricted because the learner sees different questions each time she takes the test, and different questions from the other learners. Also, the questions can include multimedia and interactivity.

Assessment is not only aiming at measuring the performance of the learner, but also assisting her to learn, create knowledge and abilities. Feedback is an important tool to support these aims. This paper analyzes the characteristics of feedback in CAT. Designers and developers of CAT systems would be inspired and guided by these feedback characteristics in order to incorporate effective feedback into the CAT systems. This feedback would be based on the individual learner characteristics and/or on the specific educational context.

The usual definition for the feedback in education relates the teacher's response to the learner's actions. Here, we introduce a more general definition. Feedback is the educator's (real or artificial) response to the learner's actions, thoughts, emotions, needs, attitudes, wills, intentions etc. It may aim to control, guide and regulate the learner, or instruct and teach her, or help and support her. It may inform the learner about her progress, her strengths and weaknesses. It may also try to develop, enhance and improve the learner's strengths as well as reduce and correct her weaknesses.

Previous research (Kulhavy and Stock, 1989; Mason and Bruning, 2001) classifies feedback into the following categories: No feedback, Knowledge of response, Answer until correct, Knowledge of correct response, Topic contingent, Response contingent, Bug related and Attribute isolation.

Carter (1984) discusses four characteristics of feedback: function, timing, schedule, and type. Schimmel (1988) recommends allowing high ability learners to select desired feedback types

because they have extensive prior knowledge and enhanced metacognitive skills. In contrast, since low ability learners tend to be less confident in their own academic skills and less aware of their metacognitive processes, they may be inclined to select feedback that provides them with the correct answer as opposed to the type of feedback that promotes the greatest learning. Freedman (1989, 1991) found that girls tend to focus on the static images in computer graphics that use lighter colors, while boys tend to like computer graphics that use bold colors and smaller, animated objects. Bationo (1992) found that the combination of written and spoken feedback was more effective than only written or only spoken feedback for the immediate recall of the learning material. However, there was no significant difference for the retention of the learning material. Sales (1993) suggests considering individual differences such as ability, learning style, and motivation in designing adaptive feedback. Azevedo and Bernard (1995) suggest that immediate feedback provides the best instructional advantage to the student. Morrison et al. (1995) found that knowledge-of-correct-response and delayed (providing feedback at the end of the testing session) feedback produced greater learning than answer-until-correct or no-feedback for lower level questions (verbatim post test questions). For higher-level questions (paraphrased or transformed posttest questions), however, there were no learning differences with respect to the various feedback types. Butler and Winne (1995) assign five functions to the feedback: Confirming conditions, Adding information, Replacing or overwriting prior knowledge, Tuning understandings, and Restructuring schemata. Narciss and Huth (2002) suggest design principles for effective feedback. They also consider the nature and quality of the feedback, the characteristics of the instructional context, and the individual learner characteristics. Herschell, et al. 2002 suggest that specific feedback is much more likely to influence student performance than haphazard, general feedback.

In the next Section 2, we introduce the feedback characteristics. Designers and developers of CAT systems would consider these characteristics to design and develop effective CAT systems. The CAT systems would adapt these feedback characteristics to the learner and/or the educational context.

## Adaptive Feedback Characteristics

In this section, we define and analyze characteristics (attributes) for adaptive feedback in CAT (Computer Adaptive Testing). Designers and developers of CAT systems may rely on these attributes to provide adaptive feedback based on the learner and/or the educational context. For example, if the learner is answering correctly all answers then minimum feedback would be presented to her. Otherwise, if she is not doing well, then elaborative feedback would be presented to help her. The following table presents the proposed feedback characteristics:

**Table 1**

**Proposed Feedback Characteristics**

| |
|---|
| 1.  Reason and Cause |
| 2.  Result, Effect and Outcome |
| 3.  Reinforcement Method |
| 4.  Mind Dimension |
| 5.  Quantity and Amount |
| 6.  Simplicity |
| 7.  Presentation, Media, Layout and Format |

| |
|---|
| 8.   Proximity and Relevance |
| 9.   Area |
| 10.  Frequency |
| 11.  Scheduling and Triggering instances |
| 12.  Timing, Synchronism and Currency |
| 13.  Duration |
| 14.  Lifetime and Phase |
| 15.  Memory |
| 16.  Comparativeness |
| 17.  Initiator and Controller |
| 18.  Interactivity |
| 19.  Connectivity |
| 20.  Personalization |
| 21.  Educational Context |

## 1. Reason & Cause

The first question to ask is what may cause the activation of feedback. It may be a "*good"* or a "*bad"* action, behavior or emotion of the learner. For example, the learner may answer correctly or wrongly a question. Or, the learner may cross a threshold. Or, the learner may accidentally push a button on the interface. Or, the learner may become frustrated.

## 2. Result, Effect and Outcome

The next question to ask is what should be the result of the feedback. We consider the following feedback types with respect to the result:

*Confirmation and Verification feedback*: it confirms and verifies a correct action, or assures the successful route of the learner.

*Maintaining feedback*: it supports the learner to maintain her successful progress.

*Enhancing feedback*: it helps the learner to enhance (strengthen, improve, amplify, augment, increase, magnify) her expertise, abilities, skills, strengths, competencies, and masteries, and gives her a leg up.

*Prevention and Avoidance feedback*: it helps the learner to prevent and avoid an error, failure or inefficiency.

*Error recognition feedback*: it helps the learner to recognize an error, failure or inefficiency.

*Weakening feedback*: it helps the learner to weaken (reduce, lower, lessen, decrease, diminish) her weaknesses, disabilities and inefficiencies.

*Alleviation feedback*: it helps the learner to alleviate and relief an error, failure or inefficiency.

*Correction feedback*: it helps the learner to solve and correct an error, failure or inefficiency.

For example, the feedback may notify the learner of a misconception she may has. Or, it may try to relief the learner's anxiety.

## 3. Reinforcement Method

Depending on the adopted didactic method, the feedback may be: 1) *Reward* (positive), 2) *Neutral*, or 3) *Punishment* (negative). For example, if the learner behaves well, then the feedback may praise her or even may challenge her. If the learner behaves improperly, then the feedback may excuse her or criticize her. If the learner makes a mistake, then the feedback may take it up or blame her. Then it may help her to correct this mistake. If the learner performs a successful action, then the feedback may congratulate her or push her further. If the learner fails, then the feedback may ignore her failure or scold her.

## 4. Mind Dimension

The feedback may be of cognitive, affective and emotional, or conational dimension.

### 4.1. Cognitive Feedback

Cognitive feedback is related to the mental activities of the learner. It may inform the learner about the CAT system, the test, the content, the question sequencing, etc. It may help her to answer the questions. It may explain the answers. It may inform the learner on her progress, her achievements, her status in comparison to other learners, etc. Extending Bloom's taxonomy, we consider the following cognitive feedback:

*Informative feedback*: it provides new and unknown information and knowledge, e.g. on how to use the CAT system.

*Remembering feedback:* it helps the learner to remember, recall and retrieve her acquired knowledge, e.g. it provides definitions, keywords, names, etc.

*Comprehension feedback*: it helps the learner to comprehend and understand her knowledge, e.g. it provides a similar question with the correct answer, interpretation of the question, etc.

*Application feedback:* it helps the learner to apply her knowledge, e.g. it applies data on a formula, graph, or program, it simplifies or solves a mathematical formula, etc.

*Analysis feedback*: it helps the learner to analyze the problem, e.g. it analyzes the assumptions and hypotheses of a question, it compares the possible answers, it provides special cases of the question, etc.

*Synthesis feedback:* it helps the learner to synthesize the problem solution, e.g. it combines concepts and ideas, it integrates mathematical formulas, it provides generalizations of the question, etc.

*Evaluation feedback*: it advises the learner on evaluating and selecting the correct answer, e.g. it critiques an answer, it provides criteria for judging, etc.

*Creativity feedback*: it guides the learner to explore and innovate, e.g. it pushes the learner to take an initiative, it asks the learner to imagine and create a virtual situation, etc.

*Collaboration feedback*: it supports the learner to collaborate with her classmates to solve a problem, e.g. it asks the learner to share her work, it pushes the learner to express her opinion, it gives credit to every member of a group, etc.

*Management feedback*: it supports the learner to develop her managerial abilities to organize projects and people, e.g. it supports the learner to organize the tasks of a group, it nominates the learner as the leader of a group, it helps the learner to guide other learners, etc.

### 4.2. Affective & Emotional Feedback.

Affect refers to the emotional interpretation of perceptions, information, or knowledge. Recently, there is a lot of research interest on affective computing. Researchers are trying to design and

develop instruments that will monitor, record, analyze and respond to the user emotions. For example, measuring the timing of the changes in a voice's pitch may detect and recognize if a person is angry. If the person is angry a more careful treatment of her should be made. We consider the following affective feedback types:

*Positive emotions feedback:* it acts and expresses positive emotions to the learner trying to develop, maintain and increase the learner's positive emotions, such as the following: 1) Enthusiasm and Fascination, 2) Happiness and Joy, 3) Satisfaction and Fulfillment, 4) Calmness, 5) Hope and Optimism, 6) Sympathy and Love. Types of positive emotions feedback are the following: 1) Humour and Jokes, 2) Entertainment and Games, 3) Reward, 4) Sympathy and Goodwill, 5) Positive Surprise, 6) Encouragement, 7) Acceptance, 8) Praise and Congratulations.

*Negative emotions feedback:* it expresses negative emotions to the learner trying to increase the learner's effort and commitment. Types of negative emotions feedback are the following: 1) Criticism, 2) Blame, 3) Anger, and 4) Punishment.

*Negative-to-Positive emotions feedback:* it tries to decrease the learner's negative emotions, such as the following: 1) Anxiety and Stress, 2) Sadness, Sorrow, Melancholy and Depression, 3) Anger and Madness, 4) Boredom, 5) Fear, Worry, and Doubt, 6) Confusion, 7) Pessimism, Defeatism and Self-pity, 8) Frustration, Despair, Hopelessness, and Panic, 9) Astonishment, 10) Shame, Guilt and Embarrassment, 11) Disgust and Aversion, 12) Hate. We classify the negative-to-positive emotions feedback into 4 stages. The feedback in the first stage should try to avoid and prevent the development of negative emotions. The feedback in the second stage should try to control and manage the learner's negative emotions not allowing them to grow. The feedback in the third stage should try to relief and alleviate the learner's negative emotions lowering them. The feedback in the fourth stage should try to transform the learner's negative emotions to positive ones.

## 4.3. Conational Feedback

Conational feedback would try to support and enhance the learners' will to learn and succeed in the CAT. We consider the following conational feedback types:

*Positive conational feedback*: it tries to enhance the learner's self, such as the following: 1) Self-awareness and Self-consciousness, 2) Interest, Will and Volition, 3) Self-efficacy, Self-esteem and Confidence, 4) Motivation, 5) Self-direction and Goal-orientation, 6) Commitment, Dedication, Determination and Persistence, and 7) Self-regulation.

For example, the feedback may inform the learner about the meaningfulness, usefulness, importance and significance of the learning (in general as well as for the specific subject) and of succeeding in the CAT. It may increase the learner's trust on the CAT validity and reliability. It may spur the curiosity of the learner. It may challenge her. It may increase her belief on herself and on her specific abilities. It may increase her belief that her effort leads to success and on her expectancy for success. It may motivate the learner showing to her the rewards, gains, profits, earnings and benefits from learning (in general as well as the specific subject) and succeeding in the CAT. It may support her orientation towards learning and succeeding in the CAT. It may help her to plan and implement her learning and test taking strategies. It may support and reward her efforts, courage and patience. It may help her to manage and control her time and actions. It may gain the learner's attention, focus and concentration. It may reward her discipline. It may offer alternatives (with or without) arguments to the learner to choose from.

*Negative-to-positive conational feedback*: it tries to decrease the learner's negative attitudes such as the following: 1) Self-ignorance, 2) Disinterest, 3) Self-doubt and Insecurity, 4) Discouragement, 5) Disorientation and Distraction, 6) Reluctance and Hesitance, and 7) Disorganization. For example, the feedback may decrease the doubt of the learner on her abilities

and on her success. It may decrease her insecurity. It may try to keep her focused on the learning and on succeeding in the CAT. It may try to overcome her reservations and hesitation to move forward to the CAT. It may try to trig up her organizational chaos.

## 5. Quantity and Amount

The quantity and amount of the feedback would vary based on the learner's state. It would vary from *short (brief)* to *extensive (detailed)*. For an expert, the quantity may be minimal. On the contrary, for a novice the quantity may include extensive explanations and examples. For example, the feedback to the learner after her answer to a question may be: i) null, ii) score, iii) score and the correct answer, iv) score and explanation about the correct and wrong responses, v) the same as in iv plus references, additional material, examples, cases, etc.

## 6. Simplicity

The feedback would be *simple* or *complex*. For example, it would be simple with respect to the syntax, grammar, concepts and ideas. The same content may be given either in simple "words" or in complicated, elaborate and rare "words".

## 7. Presentation, Media, Layout and Format

Various format and layout types may be used for the feedback. Also, various multimedia (text, pictures, figures, animation, audio, video, etc.) may be incorporated in the feedback depending on the learner and the situation. For example, if the learner is a verbal person, then the question and possible responses may also be spoken.

## 8. Proximity and Relevance

The feedback would be *exactly to the point* or *roundabout.* For example, the hint to answer a question would be exact and precise or fuzzy and approximate. Depending on the level of help, the system would provide feedback that is more or less close to the answer. Another example is that the feedback to a question would be a mathematical formula, a graph, or a number. The feedback proximity (relevance) has the following dimensions:

> *i) specific and concrete* -versus- *general and abstract,*
>
> *ii) clear* -versus- *ambiguous and fuzzy,*
>
> *iii) exact and precise* -versus- *approximate,*
>
> *iv) direct, straightforward and explicit* -versus- *indirect and implicit.*

## 9. Area

The feedback would be triggered by the learner's actions on one of the CAT areas, e.g. on the user interface, on her answers, on her communication and collaborative activities. The feedback may inform, advise and help the learner in any of the following CAT areas: 1*) User Interface, 2) System (hardware and software), 3) Content, 4) Presentation, 5) Navigation, 6) Orientation, 7) Sequencing, 8) Communication and Collaboration, 9) Test Duration, 10) Test Control, and 11) Scoring.* For example, an agent may help the learner on formatting or spell checking her answer. A guide may tour the learner on the CAT system. A search engine may help the learner on finding useful reference material to accomplish her task. An avatar may help the learner to answer a question.

## 10. Frequency

The feedback may be triggered and presented to the learner *rarely* or *frequently*. The frequency of its appearance depends on the learner state. For example, an independent learner may prefer low system intervention. On the other hand, a scared learner may need continuous guidance. So, the system should provide her feedback very often.

## 11. Scheduling and Triggering instances

The feedback may appear at *scheduled* or *dynamic instances*. Its appearance may also be *deterministic (fixed)* or *probabilistic*.

In *scheduled feedback*, the system may help the learner at pre-specified instances. For example, the system may inform or advise the learner at the beginning of the test, or after every answer, or after every N questions, or after every subtopic, or at the end of the test, etc.

In *dynamic feedback*, the system or the learner may initiate the feedback depending on the learner state. So, the system may continually evaluate the learner's state and help her whenever she passes some threshold (e.g. time threshold, stress threshold, knowledge threshold). Also, the system may intervene in case of learner's error or right action. On the other hand, the learner may ask for help whenever she decides (e.g. needs additional information, feels desperate or disoriented).

In *deterministic feedback*, the feedback appears definitively if it was so decided by the system or the learner.

In *probabilistic feedback*, the feedback does not always appear. When the system or the learner decides to invoke the feedback, a coin is tossed. Depending on the result, the feedback may or may not appear. Introducing randomness in the CAT, the learner is kept alert and challenged. For example, if the learner invokes for help, then the system flips a coin and either decides to help her or propose her to try more. Similarly, in scheduled feedback, the system may flip a coin after every answer and decides to inform or not the learner about the correct answer.

## 12. Timing, Synchronism and Currency

There are three feedback types with respect to their timing and currency: i) *in advance (preview)* that appears beforehand of an action, ii) *immediate (instantaneous)* that appears immediately after of an action, and iii) *delayed* that appears some time after the action has taken place. The feedback may inform, notify, advise, recommend, motivate, alert or warn the learner about several issues. So, we may have the following feedback types:

*In advance informative feedback*: it informs and notifies the learner beforehand of an action. For example, it may inform the learner about the whole test before the test initiates or about a question before it appears. It may inform her about the educational goals and objectives of the test, what subjects and abilities are to be measured, how they will be measured, how they will be interpreted. It may also inform her about the required subject prerequisites, the required computer expertise to use the CAT system, about its access, features, tools, resources, help and hints available, about how to use it. Furthermore, it may inform her about the question types, the media and format, the test type, the test duration and deadlines, FAQ, etc.

*In advance advisory, suggesting and recommending feedback*: it advises, suggests and recommends alternatives to the learner beforehand of an action. For example, it may advise her about effective test strategies, time management, etc.

*In advance alerting, alarming, and warning feedback*: it alerts and warns the learner about common errors and inappropriate actions beforehand of an action.

*In advance emotional touching and sensitizing feedback*: it supports emotionally the learner beforehand of an action. For example, it enhances her enthusiasm, hope and optimism. It may reduce her stress, relax her anxiety and fear.

*In advance motivating feedback*: it motivates the learner beforehand of an action. For example, it explains to her the test's usefulness, meaningfulness, appropriateness, reliability, validity,

accuracy, fairness, security and confidentiality. It may also inspire her curiosity and gain her attention.

*Immediate informative feedback*: it informs the learner immediately after of an action. For example, it informs the learner after her response to every question about her current state, her score, the correct answer, explanation and elaboration on the answer, clarification about misconceptions, her progress, comparison to other learners, the remaining time, subjects and questions, the resources availability and restrictions, etc.

*Immediate advisory, suggesting and recommending feedback*: it advises, suggests and recommends alternatives to the learner immediately after of an action. For example, it may advise the learner after her answer to a question about references on bibliography, additional activities, etc.

*Immediate alerting, alarming, and warning feedback*: it alerts, alarms and warns the learner immediately after of an action. For example, it may warn the learner if she is trying to cheat, or to access prohibited resources. It may also alarm her about trivial errors (e.g. spelling).

*Immediate emotional touching and sensitizing feedback*: it supports emotionally the learner immediately after of an action. For example, it may comfort the learner. It may reduce her panic. It may encourage, praise and congratulate her on her effort, on her results, etc. However, it may also criticize and blame her.

*Immediate motivating feedback*: it motivates the learner immediately after of an action. For example, it may assure her that she is doing well, that she is on the proper route. It may also, stimulate and challenge her.

*Delayed informative feedback*: it informs the learner after some time of an action. For example, after the test, it informs her about her score, strengths and weaknesses, test duration, for the total test, for each ability and subject tested, for each subtopic, for each question, in comparison to her past performance as well as to other learners.

*Delayed advisory, suggesting and recommending feedback*: it advises, suggests and recommends alternatives to the learner after some time of an action. For example, after answering questions related to a subject, it advises her about additional studies, work to do, activities, etc.

*Delayed alerting, alarming and warning feedback*: it alerts, alarms and warns the learner after some time of an action. For example, it alerts the learner about misconceptions and false ideas she may have. It may also warn her after the test about failing the class if she is not studying harder.

*Delayed emotional touching and sensitizing feedback*: it supports emotionally the learner after some time of an action. For example, it may try to cool down her after the test. Or, it may try to tranquilize an agitated learner. It may congratulate or criticize her about her effort or results.

*Delayed motivating feedback*: it motivates the learner after some time of an action. For example, it may enhance the learner's self-direction and confidence. It may reduce the learner's shame, guilt and embarrassment.

## 13. Duration

The feedback may be provided for the whole duration of the test or during some period of the test (e.g. during the first 10 questions). This feedback duration may be *short* or *long*. It may be *fixed* or *dynamic* depending on the learner state. It may also be *deterministic* or *probabilistic*. For example, a learner who answers correctly all 10 first questions may no need feedback. A learner who answers correctly the 9 first questions and wrongly the $10^{th}$ question may need (or not) feedback. This decision would be made probabilistically.

## 14. Lifetime and Phase

Each time the feedback appears it lasts for a period of time. This feedback lifetime may be *short* or *long*. It may be *fixed* (e.g. 1 minute) or *dynamic* (e.g. the learner decides). Also, it may vary *deterministically* or *probabilistically*.

The feedback lifetime follows the following phases: *1) Cause Recognition, 2) Feedback Activation and Initiation, 3) Feedback Application, 4) Management, 5) Feedback Termination, and 6) Result Evaluation.*

## 15. Memory and its Depth

The feedback may be based only on the current state of the learner or also consider the learner's past. In the *memory-less feedback*, the system helps the learner ignoring her past. The decisions are based only on the current learner state. In the *memory-based feedback*, the system helps the learner taking into account her past and her progress up to the current moment. The depth of the memory is also another attribute. It may be *one-step* or *many-steps* back.

## 16. Comparativeness

The feedback may track only the learner in isolation from other learners or keep comparing her to other learners. In the *isolated feedback*, it does not take into account the other learners. In the *comparative feedback*, it informs the learner about her current state and her progress in comparison to other learners.

This comparison may be *simple* or *comprehensive*. For example, it may compare only the learner's score to the average score among all learners. Or, it may compare the learner's full state to those of other learners.

Furthermore, it may be based on the *current state* or the *progress*. For example, it may compare the learner's current score to those of other learners. Or, it may compare the learner's route of the score, time per question, correct-wrong answers, etc. to those of other learners.

Regarding the other learners, the comparison may be with respect to: 1*) the average learner, 2) the mean learner, 3) the low 20% learners, 4) the top 20% learners, or 5) an expert*.

## 17. Initiator and Controller

The feedback can be initiated and/or controlled: *1) by the system, 2)* by *a person, or 3) cooperatively by both*. This person may be the learner, a classmate, the tutor, the teacher, the examiner, the parents, the employer, etc. In a cooperative mode, the system may propose a set of help alternatives, and the learner selects one of these. In a different cooperative mode, sometimes the learner may call for help, and other times the system may take the initiative to guide the learner.

## 18. Interactivity

The interactivity between the learner and the system may be at a single or at multiple levels. In a *single level interactivity*, when the learner performs an action, behavior or emotion, then the system presents to her a single feedback instance (snapshot).

In a *multiple level interactivity*, the system and the learner have a dialogue. So, depending on the responses of the learner the system presents to her a sequence of feedback instances. For example, the CAT system may present a difficult question to the learner at once or in a sequence of increasing difficulty sub-questions. If the learner has difficulty to answer the question at once, the system may help her at an increasing dose.

### 19. Connectivity

The feedback would be connected to other resources or people. For example, the action of the learner may trigger the intervention of a real or artificial tutor (avatar) who will help the learner to accomplish her task. Also, the feedback would initiate a program to run with input variables given by the learner. Finally, the feedback would be connected to additional reference material on the Web, on a database, on a library, etc.

### 20. Personalization

The feedback would be personalized to the learner and/or the teacher/examiner. So, the various attributes of the feedback are adapted to the learner's state. For example, the quantity or the proximity would be adapted to the learner's previous knowledge, abilities, emotions, and values. Also, the presentation would be adapted to the learner's intelligence (visual, verbal, mathematical, kinesthetic, etc.). Or, if the learner is frustrated, then emotional touching and sensitizing feedback would alleviate her frustration. Furthermore, the feedback attributes would be also adapted to the teacher's or examiner' state. Instead of providing only the standard and "objective" point-of-view, it would provide the subjective teacher's or examiner's point of view. In this way, pluralism and freedom of expression would be sustained.

### 21. Educational Context

The feedback would be adapted to the educational context. Obviously, the feedback should correspond to the content of the test questions. It should take into account the prerequisites, the purpose and the expected outcomes of the test. It should be in agreement with the pedagogical and didactic theories of the test. For example, the reinforcement method should agree with the didactic method.

## Conclusions

Feedback is a powerful tool to improve learning. This paper analyzes the characteristics of the feedback in CAT. Twenty-one characteristics (attributes) have been analyzed. Designers and developers of CAT systems may rely on this analysis to produce adaptive feedback. The CAT systems would adapt the feedback characteristics to the individual learner and/or the specific educational context. Of course, these feedback characteristics may also be used in other educational (or not) situations.

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## About the Author

Prof. Anastasios A. Economides received the Diploma degree in Electrical Engineering from Aristotle University of Thessaloniki, in 1984. Holding a Fulbright and a Greek State Fellowship, he received a M.Sc. and a Ph.D. degree in Computer Engineering from the University of Southern California, Los Angeles, in 1987 and 1990, respectively. Currently, he is Vice-Chairman of the Postgraduate Program in Information Systems at the University of Macedonia, Thessaloniki, Greece. He has published over 90 peer-reviewed papers.

Prof. Anastasios A. Economices
Information Systems Department
University of Macedonia, Thessaloniki 54006, Greece

economid@uom.gr

# Creating Presence and Community in a Synchronous Virtual Learning Environment Using Avatars

**Leonard A. Annetta, Shawn Holmes**

**USA**

## Abstract

Effective synchronous instruction over the Internet has been the quest of researchers and practitioners for some time. As technology advances and today's students become increasingly more techno savvy, Virtual Learning Environments are becoming a viable vehicle for distance instruction. Synchronous learning environments provide rich opportunity for building learning communities and Virtual Learning Environments allow students a sense of presence within their class. This explanatory case study investigated the relative effectiveness of using avatars in a Virtual Learning Environment for building learning communities and presence in a synchronous online science education course. Observation and interviews were conducted within 2 cases: Case I consisted of 12 graduate science education students participating in their first online course. Case II consisted of 14 undergraduates. Results suggest students' avatars provide a sense of presence that is the catalyst for community and learning. Furthermore, a variety of avatar choices allowed for individuality by which these results suggest is a critical component of course satisfaction.

**Keywords**: Distance Learning, presence, virtual environments, communication, gaming, Internet, avatars, learning communities, e-learning, synchronous, instructional technology, computer mediated communication, satisfaction

## Introduction

Access to the Internet is increasing, not only in terms of who can get online, but also in terms of what devices can assist in getting online. This trend, driven by the increasing demand to keep in touch and stay informed, is resulting in more possibilities for communication and information retrieval (New Media Consortium [NMC], 2005). For example, more college age students are synchronously participating in online video games. "Today's teenagers live and swear by the cult of computer games and people whose lives had remained untouched by computers have been drawn into the computer arena through the lure of games. Online gaming remains an entire subculture with its own meeting places, characters, and environments" (Jayakanthan, 2002, p.98). The worlds by which video games immerse players lend themselves to Virtual Learning Environments (VLE). In this study, VLE is defined as a three-dimensional world where multiple students can interact in real-time while using avatars as representations of themselves. The popularity of these and other virtual communities (such as 3D online chats) reflects the fact that individuals are using new technologies, such as the Internet, to fulfill both social and economic goals (Wind & Mahajan, 2002).

In a report entitled, "The Internet Goes to College", (Jones, 2002) detailed the degree to which today's college student relies on technology. Nearly four-fifths of college students agree that Internet use has had a positive impact on their college academic experience. About half of all

college students (48%) are required to use the Internet to contact other students in at least some of their classes. 42% of college students say they use the Internet primarily to communicate socially. But 85% of college students consider the Internet to be an easy and convenient choice for communicating with friends. Half of the students who took an online course said they believed they learned less from the online course than they would have from an on-campus course. 84% percent of Internet users have contacted or participated in a virtual community (Horrigan, 2001).

Based on these findings, it is clear that for students already enrolled in traditional college courses, online education has a long way to go before it might challenge the traditional classroom. College students use the Internet more as a medium for social communication than for educational or professional communication. The answer might be that online course designers are not meeting the needs of their students. College students are a group primed for interactive entertainment. Although most did not report the Internet being a primary entertainment device in their lives, the degree to which they use it for socializing makes the Internet an important leisure activity (Jones, 2002). The game playing generation thinks fundamentally different than those who have not spent thousands of hours playing digital games (Prensky, 2001). We need to ask what students' want and how new electronic media can motivate them to become immersed in online education (Zemsky & Massey, 2004).

## VLE for Distance Education

As today's college students continue to rely on technology in and out of the classroom, it is critical distance educators find ways to meet their needs. For example, *Podcasting* is becoming more commonplace as an instructional tool as is instant messaging acquired through cell phones. Virtual reality research suggests participation in a 3D environment supports the constructivist paradigm of instruction. VLE's provide facility for experimental learning by allowing the students to explore the VLE at their own pace in real time (Dede, 1995). 3D worlds have the potential to provide various types of educational initiatives such as extension of the classroom and as a medium for distance education (Dickey, 2000). Programs for synchronous communications have moved beyond text-chat to become more rudimentary forms of virtual reality (Jackson, Lamora, Darby & Russell, 2002). Individuals also use virtual communities to discuss shared interests (communities of interest), to develop social relations (communities of relationships) and to explore new identities (communities of fantasy) (Hagel & Armstrong, 1997).

## The Case

The sample of this study was comprised of two cases. Case I consisted of twelve students participating in a synchronous, online graduate science education class. The focus of the class was designing and implementing role play/adventure games as a supplement to K-12 science instruction. Case II had 14 undergraduate science education students enrolled in a senior seminar during their student teaching semester. Both courses were designed on the ActiveWorlds™ platform. ActiveWorlds™ was created for social interaction in 3D immersive worlds created by individual users. Through close collaboration with the ActiveWorlds™ staff, these courses set parameters as to who could enter the world. Each student chose an avatar, a 3D embodiment that conveyed their identity, presence, location, and activities to others (Benford, Greenhalgh, Rodden & Pycock, 2001). The word avatar is derived from Hindu as an incarnation of a deity in a human or animal form.

This explanatory case study investigated the relative effectiveness of using 3D, multiuser Virtual Learning Environments as a method of delivering synchronous distance education coursework. Specifically, this study set out to answer the question, what role do avatars play in developing presence in a distance education class?

## Literature Review

### VLE

Virtual learning environments have definitions ranging from online message boards to 3-D worlds. These worlds have evolved from the popularity and engaging atmosphere of video games. Games are not new to education. Teachers at all level have used some type of competition within their instruction to provide students with a fun, challenging learning environment. Technology and gaming combined in interesting ways, have the potential to impact today's students (Kirrirmuir, 2002) who have grown up in the digital age. What is evolving is the way technology is applied to gaming in education, with new combinations of concepts and games appearing on the horizon (NMC, 2005). Neal (2003) and Foreman (2003) predicted game technology will replace classrooms, lectures, tests, and note taking with fun, interactive learning environments. For education, what is needed is more high-quality user-relevant software, combining the best game techniques (contributed by games designers) and proven learning techniques (contributed by teachers), implemented on consoles with which learners are familiar, rigorously tested, independently evaluated, and widely publicized (Kirrirmuir, 2002). Kirrirmuir (2002) challenged educators to investigate the opportunities provided by ubiquitous gaming consoles, such as stability, ease of use, and broadband access. Kirrirmuir justified this challenge by stating games are diverse, complex, engaging and attractive; and they are being played in rapidly increasing number.

Video games often have a reputation of violence and adult situations. However, role-playing and adventure games lead gaming sales. In education, there is room for games where the goal is to solve a problem cooperatively where everyone can win at some level. If the outcome of a game is not to have a single winner, but to have a group come up with a perfect solution to a problem, more than one group may achieve this outcome. Thus the point becomes problem solving and working together rather than winning or defeating opponents (NMC, 2005). VLE's can provide such a platform for teaching and learning as they allow real time interaction between the user and environment (Cobb, Neale, Crosier & Wilson, 2002). Porter (2004) defined VLE's as an aggregation of individuals or business partners who interact around a shared interest, where the interaction is at least partially supported and/or mediated by technology and guided by some protocols or norms. Britain and Liber (2000) asked teachers to evaluate VLE's from an educational perspective to determine whether they can be embedded into their teaching practices. Due to their 3D nature, VLE's also have great potential for demonstrating complex abstract concepts, such as representing a magnetic field or simple machines (Dede, 1995). VLE's motivate learning by challenging, providing curiosity, beauty, fantasy, fun, and social recognition. They often reach learners who don't do well in conventional settings (Dede, 2004).

VLE's come in different shapes and sizes. The literature suggests that five attributes could be used to characterize virtual communities: (1) Purpose, (2) Place, (3) Platform, (4) Population Interaction Structure, and (5) Profit Model (Porter, 2004). Porter (2004) proposed a typology of virtual communities that included two first-level categories: Member-initiated and Organization-sponsored. Member-initiated communities are those where the community was established by, and remains managed by those members within the community. Organization-sponsored communities are communities that are sponsored by either commercial or non-commercial organizations such as educational institutions. A second level of the typology contains virtual communities categorized by their general relationship orientation of the community. Relationship orientation refers to the type of relationship fostered among members of the community. Member-initiated communities foster either social or professional relationships among members. Organization-sponsored communities foster relationships both among members (e.g., customers, employees, students) and between individual members and the sponsoring organization (Porter, 2004).

Hoyt, Blascovich and Swinth (2003) examined VLE's within a social psychology perspective by replicating social influence effects. Specifically, Hoyt looked into the social facilitation/inhibition effects wherein individuals' performance on a task is affected by the presence of others. Results suggested participants mastered one of two tasks and subsequently performed the mastered or non-mastered task either alone or in the presence of a virtual human audience whom they were led to believe were either computer-controlled agents or human controlled avatars. Those performing in the presence of avatars demonstrated classic social inhibition performance impairment effects relative to those performing alone or in the presence of agents.

## Learning Communities and Presence

A learning community has been defined as a culture in which everyone is involved in a collective effort of understanding. In these communities learners share and develop a repertoire of resources (experiences, tools, stories), allow for a close connection between learning and doing, addresses the informal and tacit aspects of knowledge creation and sharing. Learning occurs in communities, learning requires greater participation in communities, and participation ensure the survival and growth of communities (Jackson et. al., 2002). Jackson continued stating emotional and social dimensions rely on synchronous virtual interchanges. It is a place where learners represent themselves through graphical avatars, and communicate with other avatars and computer-based agents as well as interacting with digital artifacts and virtual contexts. Through these 3D graphical environments the users gain a perception of actual travel in a virtual space.

Brown (2001) describes a three-stage process by which a community is formed in an asynchronous distance learning class: 1: Making friends; 2: Community conferment or acceptance; and 3: Camaraderie. Each stage represents a greater degree of engagement in both the class and the dialogue over the previous stages, and greater levels of interpersonal bonding or affiliation. The advantages of students building community include improved confidence expressing oneself, learning from others, and feeling connected and accepted. However, online learning environments that feature mainly asynchronous text-based computer-mediated communications (CMC) have been criticized for their lack of support for social presence, and this lack of support may impact the sense of belonging and acceptance in a group (Rovai, 2002). However, if there is one strong area where the Web has been most effective, it is by making ample interaction feasible. This interaction, if consciously programmed into the course, allows students to discuss ideas online, ask questions, share information, tackle group projects, develop joint understandings and even forge friendships. If someone complains that online learning is passive, the problem isn't the web, it is the use that is made of it (Meyer, 2003).

Presence is traditionally defined as the psychological perception of "being in" or "existing in" the VLE in which one is immersed (Witmer & Singer, 1998). Garrison and Anderson (2003) defined presence as the ability of participants in a community of inquiry to project themselves socially and emotionally, as real people through the medium of communication being used. Short, Williams and Christie (1976) stated social presence is the critical factor in a communication medium and the ability to work collaboratively is at the heart of social presence theory (Garrison, Anderson & Archer, 2000; Tu & McIsaac, 2002; Gunawardena & Zittle; 1997). Gunawardena and Zittle (1997) reported "social presence" (i.e., the degree to which a person is perceived as real in an online conversation) is a strong predictor of satisfaction with CMC and reports intimacy and immediacy enhance social presence although they are not mutually exclusive. One could then argue that social presence is strongly associated with individuality. If a student in an online community feels they are perceived as an individual then they feel a sense of presence within that community. Festinger, Pepitone and Newcomb (1952) defined this as deindividuation: a state in which people lose their individuality because "group members do not feel they stand out as individuals" and individuals act if they are "submerged in the group".

For distance educators, one might follow the lead set forth by Chepya (2005). Chepya redefined distance learning as "presence learning." Presence learning creates a palpable connection between the instructor and the student, engaging students in "reality" and not "virtual reality"—another outdated aphorism. Supplying people's need to connect with each other in meaningful ways, social networks and knowledge webs offer a means of facilitating teamwork and constructing knowledge. The underlying technologies fade into the background while collaboration and communication are paramount (NMC, 2005). Within the confines of a VLE, presence can be thought of as a product of two factors: (1) "arrival," or the sense of being in the VLE, or (2) "departure," or the sense of not being in the VLE (Kinm & Biocca, 1997).

Benefits VLE's bring to the teacher are increased participation and performance (Pilkington, Bennett & Vaughn, 2000). However, this is only true if the course design is synchronous in nature. Synchronicity can be valuable for virtual communities provided that members actually take advantage of the synchronous technology design by interacting (Blanchard, 2004). With Voice over IP (VoIP) technology becoming more mainstream and student comfort with real-time chat allows for a synchronous learning environment. Indeed, a highly interactive environment can enhance a member's perception of social presence, co-presence and sense of place (Blanchard, 2004; Liu, 2005). It also can facilitate the construction of social reality for members (Rafaeli & Sudweeks, 1997).

## Avatars

Avatars are graphical embodiments that convey a student's identity, presence, location, and activities to others. In VLE's the 3D nature of the environment allows for a first person view of the environment, classmates, and instructor. Barfield and Hendrix (1995) distinguished virtual presence from real world presence as the extent to which participants believe they are somewhere different than their actual physical location while experiencing a computer generated simulation. Avatars create a cognitive residue where students believe they are in an actual environment. Avatars use one of the most powerful forces in the human psyche: social interaction (Moshell & Hughes, 2002; Garrison, 2000).

By feeling one is participating in an actual environment, distance educators can move current relationship theory away from the dependency on "physical co-presence of individuals" and into a realm where the attraction and social dimension are seen as essential components to forming relationships through VLE's (Lea & Sparks, 1995). The premise of "social presence" is that if other people (in the form of avatars) reside in a VLE there is more evidence that the VLE actually exists. Correspondingly, if other persons in a VLE essentially acknowledge one's presence in the VLE, it offers further affirmation that one actually "exists" in that environment (Sadowski & Stanney, 2002).

Avatars potentially build and sustain group commitment through expression of feelings such as salutations using a person's name and/or referring to the group as "we" (Rourke, Anderson, Garrison & Archer, 1999). They are able to use these avatars to interact with contents of the world and to communicate with one another using different media including audio, video, graphical gestures and texts. VLE's can be seen as the result of a convergence of research interests within the virtual reality and computer-supported, cooperative learning communities (Benford et. al., 2001).

## Methods

This study consisted of an instrumental, explanatory case study design. This design was chosen because of the methodological triangulation that increases confidence in the interpretation of the results. Two cases were analyzed to ascertain individual emotions of presence in a VLE.

## VLE Platform

The 3D VLE chosen for this study was ActiveWorlds™. ActiveWorlds™ is designed for casual online chat and for businesses to showcase and sell their products. Recently ActiveWorlds™ added the education universe where educational institutions can purchase virtual server space at a reduced rate for teaching and learning purposes. The universe allows for real-time chat and VoIP technologies to be integrated into a VLE. The administrator of the VLE, the instructor in this case, has rights to build the environment as seen fit. ActiveWorlds™ provides the administrator with over 20,000 objects and textures to choose from for the building environment.

## Sample

Case I consisted of 12 science education graduate students participating in their first synchronous, online class. The course was designed to introduce 3D role-play games as a viable source for technology integration in secondary school science classes. Case II consisted of 14 undergraduates enrolled in a senior seminar as part of their student teaching experience. None of the students in either case were exposed to VLE's before this course. In both cases, students were given directions on how to access the VLE and where to meet once inside the VLE. Students were instructed to view the various avatars available to them. Case I was given 100 different avatars to choose from that ranged from common humans to abstract objects such as a motorcycle or helicopter to animals. Case II were only given 2 choices: a male tourist and a female tourist.

## Data Collection

Data was collected in a three forms. Observation of each student was noted during each class. Since both classes were given various assignments outside of class time, a server side bot was written to ascertain individual avatar changes and to record conversations while the instructor was not present. Finally, each student was interviewed at the conclusion of the classes. The interview protocol was designed to determine the reasons for avatar choices and individual student attitudes as to how the avatar choices correlated with class satisfaction.

# Results

From the aforementioned data collection, it became obvious that students preferred to have a variety of avatars to choose from. Particularly true was the functionality different avatars presented. Table 1 shows the students from Case I, their avatar choice(s) and a justification for their avatar choices.

**Table 1**

**Case I Avatar Choices and Justification**

| Case I Student | Avatar(s) | Reason for Choice |
|---|---|---|
| Stacey | Natasha | She moved quickly; She looks good; Her fashion was trendy |
| | Special Agent | She looks like the girl from the Matrix; She could fight; |
| Tom | Godfather | It was a funny character |
| | Jester | He fits my personality |
| | | I used him while building because he moved fast while flying |

Birdy

Carrie

She looked like Kate Blanchett…I love her.

Michelle

Shelly

She looked most like me.

Jamie

It was fun and showed my geekyness.

Female Cyborg

Mary
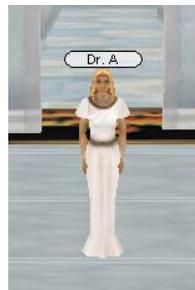
I thought it would be cool. There were so many choices that I never changed. Heck, I didn't even know what I looked like until I realized I could switch to a third person view.

Cleopatra

Samantha

I thought she would help me stay inconspicuous.

Jolie

Special Agent

Susan

I liked using her when I would go around seeing what others in the class were building. Plus she has the body I wish I had in a lycra suit.



Lenora

I switched a lot. Maybe I have multiple personalities. My choice of avatar was based on my mood that day. On days I felt like wearing pajamas, I picked Lenora.



Jolie

I chose either of them on days I felt more casual



Tiphany



Juanita

Loo

I stuck with her for a few days when I was feeling a little wilder and because she looked like someone from Blade Runner.

Lian

When I knew I had to present in class, I chose her because she dressed business like.

Mike

Chris

He looks just like me

Loren

Nicolette

I chose her because she looks normal. I am not a glamorous person so I didn't want to be a princess or any of those.

Peter

Clint

I love Clint Eastwood and this was just too funny. I love the cigar in his mouth too.

These data suggest students chose avatars based on either the avatars function in the class assignment, or more commonly by how the avatar affected the student as individuals. Of particular interest was the fact that only Tom chose to use a non-human avatar at any one time in the course. Although Case I had 8 non-human avatars from which to choose, all with different functions, only Tom chose Birdy. Case II had very different reactions that were primarily a result of their lack of avatar choices (table 2).

**Table 2**

**Case II Avatar Choice and Response to their Choice**

| Case II Student | Avatar(s) | Response to Avatar Choice |
|---|---|---|
| Reed |  Female Tourist | I look like everyone else |
| Lynn |  Female Tourist | This stinks.   Is there a way to choose another avatar? |
| Maria |  Female Tourist | I wish I could be a lion or something cool.  I look like the other girls. |
| Leigh |  | She kind of looks like me. |

Female Tourist

Anne

I don't look anything like her.  Is there a way to change her?

Female Tourist

Joann

How do you know who is who?  We all look the same except for the 2 boys.

Female Tourist

Edward

This is cool.

Male Tourist

Mia

Can I at least change my name so I can discern myself from the others?

Female Tourist

McKinney

I didn't even know what I looked like until I used the third person view.   I don't like that I look like the other females.

Female Tourist

| Annette | | I look like a dork.  Of course that is fitting I suppose. |
| --- | --- | --- |
| | Female Tourist | |
| Alan | | If I were really a tourist, I would have a drink in my hand. |
| | Male Tourist | |
| Elizabeth | | This is too funny.   We all look the same. |
| | Female Tourist | |

What is apparent in the responses from Case II is the feeling lacking individuality, and subsequently presence, in the VLE in which they participated. What follows is a discussion of these results and the implication for distance education practice.

# Conclusion

## Avatars Role in Providing a Sense of Presence

The first theme that arose is the fact that the instructor must "be there" and create a "there" that is palpable to everyone if the course is to be a success. When Internet communication works, the medium becomes a place, as a physical classroom is a place. The shared experiences of the lectures and the discussion create a shared memory of incidents and events (Chepya, 2005). Avatars provide individual students a sense of being. When given a plethora of avatars from which to choose, students find a representation that is unique to them or one that provides assistance on a particular task. As Gunawardena and Zittle (1997) reported, social presence is a strong predictor of satisfaction with CMC. For students to feel the online course was a worthwhile experience, they need to feel as if they were part of the big picture.  They need to feel they were different from the others in the class. Social presence is also seen to influence not only online activities generally designated as group projects, but also those usually designated as individual projects (Richardson & Swan, 2003). In addition, students with high overall

perceptions of social presence scored high in terms of perceived learning and perceived satisfaction with the instructor (Richardson & Swann, 2003).

Moreover, students need to see and hear others; even if the others are avatars. Humans are hard wired to engage in the learning process in this manner. From preschool through college, students interact in a social environment in which a teacher is present directing them toward a common goal. Distance education should not be any different. Course design needs to juxtapose making students feel as if they are part of the whole and that they are individuals. As this study suggests, students with a sense of presence in a synchronous, online class will have a higher degree of satisfaction with the course.

## Community and VLE's

Before a community can become a knowledge-building community it is first necessary to establish a "safe space" in which the sharing of knowledge is encouraged and validated (Pilkington & Walker, 2003). In a learning community, students learn to cooperate and make teams work. Past technologies (print, photography, film, and computers) have enabled idea sharing, but are one-way communication modes. Broader learning communities have been made possible through electronic field trips, online mentoring, science investigations, and humanities activities (Riel & Fulton, 2001).

According to the University of Manchester's Mark Clark, "The nature of documents is increasingly trending to compound documents that incorporate image, data, text, and voice annotation. E-mail is likely to shrink as a way of sharing documents, giving way to the increased use of collaborative working environments for document development analysis, editing, and even drafting. Video conferencing, particularly that on the high end associated with technologies such as access grids, is showing exponential growth. Increasingly, virtual communities will be built upon networks as the glue to provide social cohesiveness. Managing the deployment and then integration of converged technologies into a cohesive, converged service environment—and ultimately into the kind of rich collaborative environment Clark describes—will likely demand considerable attention in the future (Katz, 2005). The future is now. The technology is readily accessible and students desire courses to meet their needs.

## What Avatars Tell Us About Students

Avatars can tell us a lot about our students. Although one might never physically meet another member of the VLE, one's avatar choice usually implies gender, ethnicity and personality. This may not always be true as the server side bot written to glean information of student progress outside of class reported one male student taking on the role of a female avatar while working on a project inside the VLE. It can be argued this tells even more about the student. As was evident from Stacey, Tom, Shelly, Samantha and Susan, avatar choices that change regularly can shed light on how the student feels at a particular time. As with a traditional class, knowing how a student feels helps the instructor know how to react to the student or at the very least understand why a student is acting differently than normal. This too can be a variable in addressing student satisfaction and ultimately learning.

# Recommendations

In conclusion it is pertinent to revisit course design using VLE's. While choosing courseware for Internet delivery, serious thought must be given to the aesthetics of online pedagogy. Just as any measurement of instructional success should take into account the effect of the instructor's particular pedagogical style and method, so too any measure of the success of online teaching should refer to the design and dynamics of the online course. The human element, companionability, and presence, once almost impossible to create on the Internet, are now

becoming a reality with the onset of emerging technologies such as VLE's. As more and more students use the Internet as a medium for social communication, it is crucial we meet their needs in the educational and professional settings as well. Distance learning is only as good as the "learning" regardless of the distance. In turn, "learning" is only as good as the sense of presence a student has and the satisfaction they perceive while in a distance delivered course.

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## About the Authors:

**Leonard A. Annetta** is from North Carolina State University, Len_annetta@ncsu.edu

**Shawn Holmes is from** North Carolina State University.

# Branding Options for Distance Learning Programs: Managing the Effect on University Image

**Nita Paden, Roxanne Stell**

**USA**

## ABSTRACT

Although university goals for adding distance learning programs vary, decisions about development and marketing of the programs can have an impact on traditional on campus programs and influence overall perceptions of the university. As universities develop distance programs, it is important that (a) there is a clear understanding of the university's brand image and the elements contributing to that image; (b) the university ensures that the distance program maintains/improves the image of the university; or (c) the university makes a decision to develop a separate identity/brand for the distance program that will stand on its own merit and not harm the university's image if it malfunctions or fails. This paper explores issues relating to the application of branding strategies to distance learning programs.

**Keywords**: distance learning programs, university image, brand image, branding strategy, higher education marketing

## Introduction

An organization's image plays an important role in buying behavior and retention decisions (Nguyen and LeBlanc, 2001). For academic institutions where the product is predominantly intangible, that image has an even more critical role in a student's and often their parents, decision to "purchase" the institution's programs. While there are numerous issues that must be addressed when deciding how to proceed with the addition of distance learning programs (Levy 2003), one that is often overlooked is the effect the new programs will have on the existing image of the university. This is an important aspect of the marketing of a university since academic reputation and the desire to attend a university have been shown to be highly correlated (Conard and Conard 2001).

Although university goals for adding distance learning programs vary, decisions about development and marketing of the programs can have an impact on traditional on-campus programs and influence overall perceptions of the university. In many cases, strategies for adding the distance learning format to a university's on campus programs do not appear to be well planned, as evidenced by the number of unsuccessful and problematic deliveries of online programs and cyber universities (Conhaim 2003; Boser 2003; Hafner 2002; Wright 1999). The transition from traditional programs to online courses and programs takes considerable adjustments for faculty and students (Carroll-Barefield, et.al, 2005). Additionally, there are often significant differences between the student's perceived need and the availability of distance learning services (Raphael, 2006). There are also differences in the degree of collaboration that occur among faculty and administrators at all levels as the programs are implemented (Schauer, et. al, 2005). Consequently, as participants in a distance learning program have experiences with various aspects of the program (e.g. technology, faculty, advisors, etc.), perceptions (either positive or negative) are formed and may be projected to the university as a whole.

As universities develop distance programs, it is important that (a) there is a clear understanding of the university's brand image and the elements contributing to that image; (b) the university ensures that the distance program maintains/improves the image of the university; or (c) the university makes a decision to develop a separate identity/brand for the distance program that will stand on its own merit and not harm the university's image if it malfunctions or fails. This paper explores issues relating to the application of branding strategies to distance learning programs.

## Brand Name and Image Formation

The value of a brand is often based on the extent to which the brand has name awareness, perceived quality and strong brand associations (Armstrong and Kotler 2003).

In an academic environment, the name of the institution is its brand and should represent the university's unique personality or image (Parameswaran and Glowacka 1995). For example some universities are viewed as the place to receive a solid education, to get connected with prominent people, or a friendly campus. It is the university's image that creates a way for the institution to differentiate and communicate its programs and the educational experience that students will receive compared to those offered at other universities. In turn, the university image can assist a prospective student in identifying which university will best meet his/her educational needs. The brand image also serves as an implicit promise that a service provider, in this case the university, will perform consistently up to customer expectations over time (Beckwith 1997). Since the student cannot fully experience the educational process prior to making a decision to attend the university, he/she must rely on the university's brand name and corresponding image (reputation) as a promise of future satisfaction.

The image of a university develops over time in a series of encounters experienced by students and other constituents. These encounters can occur at any point and include planned and unplanned communication messages from a variety of sources, as well as experiences with university employees and/or the service process. In the context of a traditional university such encounters could include a network of interactions the student has with the university staff, faculty, students and facilities. For example, the initial formation of the university image can occur when a prospective student hears positive word-of-mouth from peers and other influential individuals or has a pleasant campus visit. This initial positive impression may make the individual more likely to consider that university as a possible choice. Subsequent positive encounters with the university, such as recruiting brochures, phone calls, e-mails or other information sources can further strengthen the positive image and provide a direct return (e.g. increased enrollment) to the university, or an indirect return through positive word-of-mouth communication regarding the institution (Dawes and Brown 2002). Since a distance learning student may never be physically on campus, his/her university encounters may involve interactions with technology or exchanges between student and on-line materials, online student and student interaction, or online instructor and student interaction (Scagnoli 2005). Universities that make an effort to build relationships with students through these types of encounters can benefit in terms of recruitment of new students and student retention (Shaik, 2005).

As a university develops distance learning programs, thought should be given to the effect the new programs will have on the current image of the university, and how that image will be formed. Traditional programs that are delivered on campus have contributed to the existing university image. As a university begins to deliver classes or entire programs online, the marketing and delivery of the classes can result in many new types of encounters and change how the university is perceived. How distance programs are branded and managed will create expectations that can affect the image and reputation of the university as a whole.

# Branding Options for Distance Learning Programs

As a university develops distance learning courses or programs, a decision should be made as to whether the program should carry the name of the university (brand extension strategy), or if the university would be better served by creating a separate name/identity for the distance learning program through individual brand strategy. For a university, acceptance of an online distance learning program can be accelerated if the university enjoys a high level of name awareness, strong positive brand associations and acceptance of the campus based programs. However, simply attaching the university's name to the distance learning programs does not insure its success and, in fact, may not be the best approach. Universities should consider the implications and risks when selecting alternative branding strategies.

## Brand Extension Strategy

With a brand extension strategy, the university would use the same name for the newly introduced product (i.e. the distance learning program). Since the university name would be attached to the distance programs, the university would hope to increase interest and enrollment in the programs by building on the existing reputation of the university.   Using a brand extension adds to the university offering by making the educational programs accessible in a different format. Using an online format to add courses or distance programs can be the university's attempt to (1) offer convenience for students who are unable to attend campus classes or for various reasons cannot attend classes as scheduled; (2) provide a different experience for on campus students; or (3) attract students who aren't receptive to the traditional educational format. Regardless of the university's motivation, with a brand extension strategy the distance learning programs use the existing university name. By doing so, potential student's are more likely to recognize the university's name and transfer its' established image (reputation) to the new distance learning program. The initial and ongoing interactions the student has with the online courses and/or distance program can also have an impact (either positive or negative) on the university's current image.

## Individual Brand Strategy

An alternative strategy is to create a separate brand name for the distance learning program. Companies often use an individual branding strategy when products vary in terms of the way the customer uses the product, or when the new product targets a different consumer segment. Within a university setting, distance education students and on-campus students may have very different needs or goals and thus, each may focus on different choice criteria for their decision. There may also be different types of students (segments) within the distance learning market. For example, within the non-traditional women's segment, there could be degree-seeking and non-degree seeking as well as sub-segments of these women with very different needs (Shank, Winchell and Myers, 2001) Significant differences in gender, age, employment status, motivation and risk taking propensity have been found between distance and non-distance learners (Latanich, Nonis and Hudson, 2001). Distance learning students may be looking for convenience and flexibility, while students interested in on-campus programs are looking for new experiences including campus life and interactions with a community of students (Andrews-O'Hara 2006). With distance learning programs, the university should determine if the programs offered are significantly different and/or are targeting segments of student with significantly different needs.

When universities adopt an individual branding strategy for distance learning programs, a separate identity is created which will have little or no effect on the existing university's image. Creating an individual brand could provide the potential for reaching many different segments of students and result in increased growth for the university (Mohammed, Fisher, Jaworski and Cahill 2002). This strategy also reduces the risk of damaging the on campus university image

should any of the separate distance programs fail or not live up to the quality standards of the university (e.g. technological infrastructure or faculty expertise is not adequate).

**Table 1**

**University Image and the Branding Decision**

| Brand Extension Strategy | Individual Brand Strategy |
|---|---|
| • Use distance learning program to support current university image<br><br>• Strengthen university image<br><br>  *add value<br><br>  *build reputation<br><br>• Create consistency across programs<br><br>• Transfer university image and associations to distance learning program | • Avoid damage to existing university image<br><br>• Establish specialization in distance learning<br><br>• Build brand to attract new segments<br><br>• Avoid transfer of negative perceptions about existing university image to distance learning program |

When the university has a well defined, positive brand image one of the goals in branding a distance program should be to support that image and add to the positive perceptions of the university's established image. The distance learning program may be welcomed by various constituents and help to support the positive image enjoyed by the university. The addition of distance learning programs can add value and strengthen the university's positioning in the market by offering additional options for prospective students. The use of **brand extension strategy** allows the university to attach the distance program to the current university brand and position the university to meet the needs of the broader community. For some universities there may be variation in the perception of the university image across segments (Karrh 2000) and brand extension could be used to create more consistency in expectations by bringing the two programs together under one brand. An additional goal of the university's strategy in branding a distance program when the university has a positive brand image should be to transfer the positive associations of the university to the distance program. When brand extension is introduced individuals often transfer what they know (brand associations about the original brand) to the new product. Brand extension strategy will benefit the distance program in this situation because students, parents and other constituents (e.g. community at large, legislators) will transfer their perceptions (brand associations) about the university to the new program. These brand associations create expectations for the consumer. Consequently, if a university has a reputation for friendly, caring faculty and staff, or small class sizes with high levels of faculty-student interaction, then students are likely to initially transfer these associations and corresponding expectations to the distance learning programs or courses.

However if the distance program is unable to deliver the same expanse or quality of courses/programs or cannot hire instructors with the same qualities as offered at the main campus, then the potential for inconsistent images and unmet expectations increases. In this situation, the university must choose a branding strategy that will avoid further damage to the existing image. When the administration believes that inclusion of a distance program is necessary to meet student needs and/or improve the university image, then creating a separate brand (i.e. **individual brand strategy**) would be the better choice of the branding strategies. That brand could be developed and promoted to stand alone, thus avoiding negative feelings or confusion associated

with the existing university brand. Additionally, the individual branding strategy can be very effective if prospective students are convinced through the university's promotional strategy that the new brand represents specialization in distance learning. If unique segments of distance learning students are identified, the brand can be developed to appeal to the targeted segments. The distance learning brand will then be associated with a program that meets the students' specific needs. If the existing university has a negative image, then using an individual branding strategy will help reduce the transfer of any negative perceptions to the distance learning program. Of course, it may be wise for the university to focus their attention on improving the image of the main campus before allocating resources to a distance learning program.

**Table 2**

**Benefits of Brand Extension Strategy**

| Brand Extension Strategy | Individual Brand Strategy |
|---|---|
| • Reduced risk perceptions<br>• Reduced marketing costs<br>• Increased student retention | • Reduced switching/<br>• Cannibalization<br>• Reduced cost of failed program |

## Reducing Risk Perceptions

When assessing risk, consumers try to determine any negative outcomes that might result from selecting a particular product/service and the likelihood that those outcomes will actually happen. There are several perceived risks consumers might associate with a purchase, such as financial risk (i.e. money will be lost or wasted), performance risk (i.e. the service won't live up to expectations) or even social risk (i.e. there will be ridicule from others). Generally, these risks are diminished as the person learns more about the service. With educational services, as the customer becomes more familiar and knowledgeable about the brand (university), confidence increases giving the customer a higher comfort level in selecting that university. Additionally, choosing a known brand helps individuals explain their actions to themselves and others. If the person's reference group is familiar with the university and its reputation, it may also indicate to others that the individual has made a quality decision and therefore gained something of value. For example, students attending a university known for offering quality, accredited degree programs believe they will have more successful job placement or receive higher paying jobs upon graduation.

A brand extension strategy is generally best for reassuring students and parents if the university enjoys a positive brand image or if the brand is at least familiar to them. Individuals become familiar with the university name in many ways. Familiarity may occur because they reside in the same area or region where the university is located, they know of someone who has attended the university, or from the university's participation in athletic conferences. Even if an individual lacks personal experience with the university, the more familiar the name and reputation, the more comfortable (less perceived risk) he/she will be in their selection. This is particularly true when the university enjoys a positive image. The prospective student will be reassured by the name and reputation of the distance learning program and may view it as more legitimate than a program offered from an unknown university.

## Reducing Administrative/Marketing Costs

Universities often pursue distance learning programs in an attempt to gain economies of scale and continue to struggle with a strategy to gain those economies of scale while ensuring quality

programs (Ketterer and Marsh, 2006). University administrators should consider both long and short term costs as they introduce distance learning programs. In addition to the costs of launching and promoting the program, the potential costs of lost and dissatisfied students, as well as damage to the reputation of the university should the program fail or not live up to expectations need to be analyzed relative to the potential benefits of the program.

In the short run, using a brand extension strategy is likely to be more cost efficient. Using the university's name on the distance learning program allows the university to market both the campus program and the distance program together. This will result in economies of scale when recruiting and promoting. In the short run, brand extension strategy generally provides a lower cost and lower risk for introducing products (Armstrong and Kotler 2002). However, as previously stated, long term costs should also be considered.

## Increasing Student Retention

An additional cost that should be considered is the cost of reaching and retaining students. Keeping current customers may cost less than attracting new ones and lost revenues occur when students, who because of various life circumstances, are not retained. Retention occurs when a student has ongoing enrollment and it is generally viewed as positive. However, identifying the reasons students do, or do not, return continues to be a concern to universities. (McKenzie, Ozkan and Layton, 2006; Nash, 2005). Poor or insufficient communication, technical problems, poor course design and inadequate training for faculty have been identified as possible reasons for low retention rates with distance learners (McKenzie, Ozkan and Layton 2006; Muirhead and Betz, 2002).

A related issue is the return of students for a second degree or continuing education. Distance learning programs are ideally suited for maintaining relationships with former students who need additional skills or higher level degrees. Brand extension strategy is appropriate for addressing the potential for retaining students via a distance program when those students are already familiar with the university. Offering distance, web based courses provides an opportunity to reach both of these groups and a distance learning program that is closely aligned with the on campus program allows students to continue with the university even though life circumstances prevent them from returning to campus.

## Reducing Customer Switching/Cannibalization

One concern with adding a new product is current customers switching from the company's existing product to the new product resulting in cannibalization of sales for the original product (Lehman and Winer 1994). For example when the distance program is added, some students, if permitted, will switch to that format from the traditional on campus delivery of classes. A related issue is whether or not a university should allow students who live on or near the campus to enroll in distance format classes when an on campus section of the class is offered. In this case, the web based class could cannibalize the campus class. While offering on campus students the online alternatives provides convenience and possibly higher satisfaction, students off campus whom the university is trying to attract will be unable to enroll in the class if seats are taken by the on campus students. Should this occur the distance learning program will not increase enrollments and negative perceptions are likely when off campus students are unable to enroll in these courses. Additionally, the needs of residential students can be very different from the needs of distance learning students (Meyer, 2004).

Switching may be less likely to happen if the university chooses to apply an individual branding strategy because the program will have a separate image and students will not view classes delivered in a distance format as substitutes for the experience that they receive from the traditionally delivered classes. The problem of switching is more likely to occur when the university introduces the distance program using brand extension strategy. Using the same brand

may imply that courses and programs can be used interchangeably. It is critical for the university to determine whether or not students targeted for the distance program represent a different segment from those enrolled in the residential programs (Magjuka and Shi, 2005).

## Reducing Cost of Failed Program

An individual brand strategy for the distance learning program may provide less risk to the university should the distance program have problems. Initially, it is expensive in terms of time and money to develop a strong brand for an online product (Mohammed, Fisher, Jaworski and Cahill 2002). However, while the costs to promote and create an identity for the program will likely be higher than with the brand extension strategy, if the program is not successful, the damage to the university's image will be lessened.

# Conclusion

Increased demand for educational opportunities other than traditional on campus formats is creating an interest in the creation and/or expansion of distance learning programs. The demand for distance programs is driven by a number of factors. These include a growing trend in lifelong learning, corporate interest in online training (Conhaim 2003), as well as, a changing society where many non-traditional students may be place bound and unable to attend campus classes for a variety of reasons. Universities that consider the distance format a means of increasing enrollments and possibly a more cost effective form of higher education than traditional campus based methods (Daniel 1996; Richardson, Morgan and Woodley 1999) are increasingly interested in developing distance programs. Additionally, universities are recognizing that distance learning programs may be necessary to compete with other educational institutions, both public and private.

Those universities experiencing declining enrollments or attempting to expand their markets may find the addition of distance learning programs very appealing. While there has been considerable discussion of this topic it is still not clear how these off campus education programs influence the overall university image. Thus, universities should be careful not to create unrealistic expectations for both traditional and distance programs. Some studies suggest that students in distance education environments are less satisfied with the course than are students in traditional environments (Ponzurick, Russo and Logar 2000). This implies that the benefits that students expected were not met.

Additionally, if the university chooses to attach its name to the "new" product (i.e. distance learning courses/programs) it must find ways to offer the same positive qualities in order to maintain a consistent image. While the addition of a distance learning program can add enrollments and possibly higher visibility of the university name, administrators should recognize that the movement away from campus based delivery can also alter the existing image of the university.

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## About the Authors:

**Nita Paden, Ph.D.** (University of North Texas) is a Professor of Marketing at Northern Arizona University. Her primary research interests are in the areas of retailing, distribution channel relationships, higher education marketing and consumer behavior.  Her research has been published in *Journal of Consumer Marketing*, *Journal of Customer Service in Marketing and Management*, *Marketing Education Review, Journal of Marketing Channels* and numerous national and regional conference proceedings.

Contact: nita.paden@nau.edu, 928-523-7376.


**Roxanne Stell, Ph.D**. (Oklahoma State University) is a Professor of Marketing at Northern Arizona University.  Her primary research interests are in the areas of consumer behavior, marketing education, and services marketing. Her research has been published in the *Journal of Services Marketing, Journal of Consumer Marketing, Marketing Education Review, Journal of Customer Service in Marketing and Management, Journal of Professional Services Marketing, Journal of Internet Commerce, Case Research Journal, Journal of Marketing Channels, Journal of Health Care Marketing Channels and* numerous regional and national conference proceedings.

Contact: roxanne.stell@nau.edu, 928-523-7404.