

**JOURNAL**

**OF THE**

**UNITED STATES**

**DISTANCE LEARNING**

**ASSOCIATION**

**January 2003**

**Editorial Board**

**Elizabeth Perrin Ph.D.**  
Editor

**Donald G. Perrin Ph.D.**  
Executive Editor

**Stephen Downes**  
Editor at Large

**Paula Moreira**  
Editor, Training and Technology

**Brent Muirhead Ph.D.**  
Editor, Online Learning

# Call for Papers

The **USDLA Journal** is a referred publication of the United States Distance Learning Association. It focuses on distance and open learning and their integration into education and training worldwide. Specific topics include: research, innovations in teaching and learning theory and practice, curriculum design, technology, learning from television, online learning, interactivity, peer learning, learning objects, administration and evaluation of distance education programs, legislation, policy frameworks and analyses, institutional change, education-industry partnerships, and other topics related to learning at a distance.

The USDLA Journal is published online monthly. An interdisciplinary panel specializing in distance education reviews all submissions.

## Copyright Information

All articles remain the intellectual property of the individual. The presentation is copyrighted by USDLA unless separately acknowledged. Permission to copy or disseminate this article is granted if the following conditions are met:

- Copies are not made or distributed for commercial advantage.
- USDLA Journal, volume, number and date (and original source for republished articles) is acknowledged.
- USDLA is notified if you provide a link to articles or the USDLA website. To disseminate copies for commercial advantage requires written permission. Contact: [eperrin@pacbell.net](mailto:eperrin@pacbell.net), T 909/369-4059 or F 909/779-0803.

## Submission of Articles

**Length:** Article submissions are usually from 2,000 to 5,000 words in length. Articles of greater length are published when the topic and treatment merit it.

**Format:** Papers should conform to APA standards. Please include a brief biography of the author or authors, mailing addresses, and email/phone contact numbers. Indicate address (usually email) to be published with article.

**Copyright Clearance:** If you include materials that require copyright clearance or permissions, please provide contact and email address.

**Word Processing:** Word, Rich Text Format (.RTF) or ASCII Text is preferred. Attach files to email or send as a diskette with one laser-printed copy.

**Graphics:** Where relevant, include separate files for photos, line illustrations, charts as email attachments or on diskette. .GIF or .JPG files are preferred. We can convert from most Adobe and Microsoft graphic formats.

## Contact Info:

Please direct inquiries concerning articles for submission as follows:

Drs. Donald & Elizabeth Perrin, Editors, USDLA Journal  
3345 Pachappa Hill, Riverside, CA 92506

**T 909/369-4059 | F 909/779-0803 | C 909/236-2658**  
[eperrin@usdla.org](mailto:eperrin@usdla.org) or [dperrin@usdla.org](mailto:dperrin@usdla.org)

# IN THIS ISSUE

USDLA JOURNAL - JANUARY 2003

## PODIUM

- New Copyright Law for Distance Education** 1  
Donald G. and Elizabeth Perrin

## FEATURE ARTICLES

- Design and Reusability of Learning Objects  
in an Academic Context: A New Economy of Education?** 3  
Stephen Downes
- Ethical Distance Education Leaders** 23  
Brent Muirhead
- Socio-Technical System Advancements:  
Making Distance Learning Changes That Count** 29  
Denise Land, Anthony Nwadei,  
Scott Stufflebeam, Cyril Olaka
- Using Peer Assessment to Develop Skills and Capabilities** 39  
Charles Juwah
- Elevating Commitment to Learning to New Heights** 51  
Colleen Fuhs
- Identifying Predictors of Academic Persistence  
in Distance Education** 55  
Angie Parker



## PODIUM

# New Copyright Law for Distance Education

Drs. Donald G. and Elizabeth Perrin, Editors

The preeminence of education and open transfer of knowledge in any form is the cornerstone for development of a vibrant, evolving society. For innovators and learners within the knowledge universe, restriction to open free access is anathema. The concern with Copyright on a broad scale is not merely with copyright policies, but with copyright politics, privatization, and profiteering. Even the respected IEEE has responded to the marketing demands and now offers its collection of 300,000 articles for \$35 for up to 25 articles per month. (25 articles per month will not sustain serious research!)

The Digital Millennium Copyright Act (DMCA) was unduly restrictive in use of copyrighted resources for distance learning. The new Copyright Law provides greater access, but with certain restrictions that should be carefully reviewed.

On November 2, 2002, President Bush signed into law the "Technology, Education and Copyright Harmonization Act," commonly known as the "TEACH Act. This law is a complete revision of [Section 110\(2\)](#) of the U.S. Copyright Act governing lawful use of existing copyrighted materials in distance education. The fundamental objective of this Law is to strike a balance between protecting copyrighted works and permitting distance educators to use excerpts of copyrighted materials in instruction.

*Administrators, technology providers, librarians and instructors and should familiarize themselves with the benefits and requirements of this law. The law assigns certain responsibilities and restrictions to each of these four groups.*

Kenneth Crews wrote a detailed interpretation of *The Meaning and Importance of the TEACH Act* for the [American Library Association](#). Additional information is available from his [Copyright Management](#) website at Indiana University.

Dr. Crews explains:

*“This is a detailed statute, with specific requirements and conditions, outlining the terms on which educators may clip pieces of text, images, sound, and other works and include them in ‘distance education.’ If a particular use does not fit these conditions, one may still consider whether the use is a ‘fair use,’ but the copyright analysis should now begin with an evaluation of [Section 110\(2\)](#) of the law, as revised by the TEACH Act.”*

*“If educators remain within the boundaries of the law, they may use certain copyrighted works without permission from, or payment of royalties to, the copyright owner-and without copyright infringement.”*

*“The new law offers many improvements over the previous version of Section 110(2), but in order to enjoy its advantages, colleges, universities, and other qualified educational institutions will need to meet the law's rigorous requirements. ... the law calls on each educational institution to undertake numerous procedures and involve the active participation of many individuals.*

The new version of Section 110(2) addresses the expanded range of allowed works, expansion of receiving locations, storage of transmitted content, and digitizing of analog works. It addresses specific duties of institutional policy makers, technology officials, librarians and instructors.

Bookmark these websites to study the benefits and responsibilities inherent in this Law:

<http://www.ala.org/washoff/teach.html>

<http://www.copyright.iupui.edu/index.htm>

Editor's Note: We are most pleased to have permission to publish this remarkable research Mr. Downes presented at the University of Milan, November 12, 2002. It is not an easy read. The density of information, learning design implications and the alternative interpretation of 'economy of education' are demanding of close attention and thoughtful consideration. We feel this paper is a milestone contribution to creative models for online learning.

# **Design and Reusability of Learning Objects in an Academic Context: A New Economy of Education?**

**Stephen Downes**

Submitted to eLearning: una sfida per l'universita, Milan, November 12, 2002

## **1. Introduction**

The purpose of this paper is not to discuss the creation and use of learning objects *per se* but rather to look at systems for locating and distributing learning objects. What will be argued is that this system is currently poorly constructed, based essentially on what may be called a silo model of distribution. A series of problems and issues related to this model will be discussed. In place of the silo model, a distributed model of learning object repositories is proposed. This model is based on a set of principles intended to create an open and accessible marketplace for learning objects, in essence, a learning object economy. To conclude, a model for a distributed learning object repository network is proposed.

For readers unfamiliar with the concept of learning objects, the generally accepted definition is that learning objects “any entity, digital or non-digital, which can be used, re-used or referenced during technology supported learning.” (IEEE, 2002) Wiley (2000) defines a learning object as “any digital resource that can be reused to support learning.” Even so, as Wiley comments, “the definition is broad enough to include the estimated 15 terabytes of information available on the publicly accessible Internet.” In this paper, a *functional definition* of learning objects is employed: a learning object is anything that is exchanged in what may be called the learning object economy.

## **2. The State of the Art**

### **Overview**

In this section, common methods for locating and retrieving learning objects will be discussed. In particular, three major systems will be described: course portals, course packs, and learning object repositories. In addition, systems for collecting and organizing learning objects, learning management content systems, will also be described.

### **Course Portals**

A course portal is a website offered wither by a consortium of educational institutions or a private company working with educational partners that lists courses from a number of institutions. The purpose of a course portal is to enable a student to browse through or

search course listings to simplify the student's selection of an online course. The following are examples of course portals.

- *TeleEducation*. A New Brunswick, Canada, learning organization, TeleEducation NB hosts the TeleCampus Online Course Directory. Courses are submitted by institutions and screened to ensure that they are fully online. The database contains more than 50,000 courses, including about 3,000 free courses and 1,200 complete and fully online programs. TeleCampus provides a subject-based directory and search services. <http://teleeducation.nb.ca/>
- *UNext*. Focusing on business education, UNext collaborates with major business schools such as the Columbia Business School, Stanford University and the London School of Economics to provide courses in leadership and management, e-commerce, marketing, finance, accounting, and business communications through the private and for-profit institution, Cardean University. <http://www.unext.com>
- *Hungry Minds*. Hungry minds offers more than 17,000 courses through its online campus, Hungry Minds University, from course providers such as the University of California at Berkeley, the University of California at Los Angeles and New York University. Hungry Minds also provides learning content through publishers such as For Dummies, CliffsNotes, and Frommer's. <http://www.hungryminds.com/>
- *Fathom*. Created by Columbia University and including partners such as the University of Chicago, the London School of Economics and Political Science, Cambridge University Press, The British Library, The Smithsonian Institution's National Museum of Natural History, and The New York Public Library, Fathom is a centralized for-profit learning object repository. While Fathom provides lectures, interviews, articles, performances and exhibits, its major focus is an offering of online courses from member institutions. <http://www.fathom.com> (You, 2001)

### **Course Packs**

Course packs are packages of learning materials collected to support a course. Offered primarily by educational publishers, course packs are collections of learning materials offered to instructors for use in traditional or online courses. The course pack may be pre-defined or custom built by the instructor. The instructor is expected to supplement the course pack with additional content, educational activities, testing and other classroom activities.

Some course packs, such as those offered by XanEdu, are stand-alone. This means that the course pack is distributed as a separate product and purchased by the student directly through the college or university bookstore. Supplementary educational materials are offered by the instructor on his or her course website or are delivered in a classroom setting. Other course packs are available for use only in a learning management system (LMS). Course packs delivered through a learning management system are more like 'default' online courses. Using tools provided in the LMS, the instructor selects the course and customizes it for delivery online.

The following are examples of course pack providers:

- *WebCT Course Packs.* The learning management system WebCT offers course packs consisting of a course structure and set of readings offered by publishers with a distribution agreement with WebCT. Course packs are purchased by the institution on a seat-license basis and are then customized by the instructor.
- *Canada's SchoolNet.* In Canada, the leading learning resources portal is probably Canada's SchoolNet. A list of resources is displayed, each with a short description and a link to an external website. SchoolNet also provides information about each site and provides an "advanced search" using metadata. Each resource in the "curriculum" area is approved by a professional "pagemaster". For the most part, however, SchoolNet links to institutional home pages, and not to learning resources *per se*. Teachers using the SchoolNet service must still search through these sites in order to locate suitable materials. <http://www.schoolnet.ca/>
- *MarcoPolo.* MarcoPolo is a compilation of teaching resources from six educational institutions that provide free internet content for K-12 education. What the six partners have in common, and what makes this an important and interesting development in online learning, is an adherence to national curriculum and evaluation standards in the subject areas. Material is categorized by grade level and individual items are matched to individual learning topics. Despite its strengths, however, MarcoPolo is a closed project; only the six member institutions contribute content. There is no centralized search facility and no metadata listings for the resources. <http://marcopolo.worldcom.com/>
- *XanEdu.* Xanedu is a learning resource site that collects articles from journals, magazines and other resource providers. Instructors may compile "course packs" consisting of collections of these materials; students who subscribe to XanEdu may access these course packs. The materials are sorted by category and may also be located using a search mechanism. Like MarcoPolo, however, XanEdu is a closed project. It draws materials only from selected publishers. And while it allows subscribed students to browse through its materials, the vast bulk of resources available on the internet cannot be found through XanEdu. <http://www.xanedu.com/>

## Learning Object Repositories

Learning objects are stored in databases called learning object repositories. There are two major types of repositories: those containing both the learning objects and learning object metadata, and those containing metadata only. In the latter case, the learning objects themselves are located at a remote location and the repository is used as a tool to locate learning objects. In the former, the repository may be used to both locate and deliver the learning object.

Most learning object repositories are stand-alone. That is, these repositories function a lot like portals in that they contain a web-based user interface, a search mechanism, and a category listing. Another major class of learning object repositories functions more like a database attached to another product. An LCMS, for example, may contain a learning object repository intended for its exclusive use.

Two major models for learning object repositories exist. The most common form is a centralized form in which the learning object metadata is located on a single server or

website (the learning objects themselves may be located somewhere else). An alternative model is the distributed learning object, in which the learning object metadata is contained in a number of connected servers or websites. Distributed learning object repositories typically employ a peer-to-peer architecture to allow any number of servers or websites to communicate with each other.

The following are examples of some learning object repositories:

- *Merlot*. Described above, Merlot is probably the most well known learning object repository. Merlot is a centralized repository containing metadata only and pointing to objects located at remote locations. It is stand-alone, acting like a portal for learning objects. In addition to providing search and categorization, Merlot provides a *peer review* service provided by communities of experts in different subject areas. <http://www.merlot.org>
- *Campus Alberta Repository of Educational Objects*. CAREO is a centralized collection of learning objects intended for educators in Alberta, Canada. A stand-alone repository, CAREO contains metadata and provides access to learning objects located on remote web servers. <http://www.careo.org>
- *Portals for Online Objects in Learning*. POOL is a distributed (peer-to-peer) repository system under development intended to create a pan-Canadian repository of learning objects. A primary objective of POOL is to develop and distribute tools for creating connected learning object repositories. <http://www.newmic.com/pool/> (not currently functioning). See also <http://www.canarie.ca/funding/learning/1999backgrounders/pool.html>
- *National SMETE Distributed Library*. In development for the (SMETE), NDSL is intended as a “federation” of learning object repositories, each library using different document formats, different systems of classification, and different database and repository management schemes. NDSL is intended to join these libraries using a common search engine called *Emerge* and a method for sharing resources called *LOVE* (Learning Object Virtual Exchange). (Chen, 2001)

## Learning Content Management Systems

Learning objects are typically small, consisting of no more than the equivalent of an hour or two of instructional time (there is some debate as to how small a learning object may be and whether educational content must contain pedagogical features, such as a statement of learning objectives, in order to qualify as a learning object). Most educational institutions deliver larger chunks of instruction, called *courses*. To create a course, therefore, a set of learning objects must be assembled into a package.

Packages organize learning objects sequentially. In order to create a course out of, say, a dozen lessons, where each lesson is a separate learning object, a course author arranges these lessons into a sequence. In some cases, where the learning objects are smaller units, course designers may need to create lessons composed of a sequence of individual modules, then the course as a whole out of the sequence of lessons. However created, the sequence of objects is used to define course-specific entities as the course outline or table of contents.

Packages are created using a Learning Content Management System. While a course author could locate and assemble learning objects by hand, it would be tedious and unproductive to do so. Courses created using learning objects are typically created using a development environment called a *Learning Content Management System* (LCMS). The LCMS performs two major functions: it provides authors with a means of locating learning objects, and it assembles them into standards compliant learning packages (or courses). (Ellis, 2001)

Though many types of LCMS are available, the typical LCMS will contain four essential features: an authoring application similar to the computer assisted software environment (CASE) described above, a collection of learning objects (called a *repository*), a means of sending the completed course to a delivery system (called a *delivery interface*), and administration tools.

<http://www.internetime.com/itimegroup/lcms/IDCLCMSWhitePaper.pdf>

<http://www.internetime.com/itimegroup/lcms/>

Using an LCMS, a course author defines major features of the course: its topic area, say, or its grade level. The author then instructs the LCMS to search through the learning object repository for relevant resources (because the data is in XML, the search can be very precise). From the search results, the author may review a learning object or select it for inclusion in the course. The LCMS retrieves the object metadata from the repository and inserts it into the course package. The LCMS automatically adds institution-specific formatting and prepares the package for delivery.

### **3. Problems and Issues**

#### **Overview**

In general, the issues surrounding the location, distribution and reuse of learning resources online have to do with system architecture and resource based on what I call the “silo model.” On the silo model, resources are not designed or intended for wide distribution. Rather, they are located in a particular location, or a particular format, are intended for one sort of use only.

The silo model is dysfunctional because it prevents, in some essential way, the location and sharing of learning resources. In an important sense, such resources or architectures are *broken* because they require some additional step, usually involving manual labor, in order for developers or learners to make use of the material. The requirement of such a step adds significantly to the cost of a learning resource and in some case may prohibit its use altogether. In fairness, this cost or prohibition may be imposed by design. However, from the point of view of a learning object economy, the resource or architecture is unusable.

There are numerous ways a learning resource or architecture may follow the silo model. In this section, a number of these are listed. Few products embody all of these problems. But most contain instances of at least one of these problems. And even a single instance of the silo model is enough to prevent a learning resource or architecture from being used as part of a network.

## **Proprietary Standards**

A standard is proprietary when it is secret or when patents, copyrights or other restrictions prohibit its use. The standard is created by a commercial entity and specifies “equipment, practices, or operations unique to that commercial entity.” (National Communications System, 1996) With the advent of the internet, proprietary standards are much less of an issue than in years past. Nonetheless, proprietary standards continue to abound, especially in the realm of multimedia formats.

The use of a proprietary standard divides a distribution network into those people or systems able to use the standard, and those people or systems unable to use the standard. For example, a document created using DXF for Autocad may not display properly in Cadkey, which uses CADL, or ACIS, which uses SAT. Another example is XrML, a digital rights management language developed by ContentGuard. Developers have been reluctant to use the standard because of Microsoft’s control over the standard. (DRM Watch, 2002)

Proprietary standards pose numerous risks to developers. One risk is that the standard will cease to be supported in new software. Documents encoded in older MS Word formats, for example, need to be converted before they can be used. There is the risk that licensing terms may change, and as a consequence, require that user pay unexpected licensing fees. If the standard is not widely shared or distributed, as is the case, for example, with Microsoft Windows, it is difficult to develop new applications, and the holder of the standard enjoys an advantage over competing products. Additionally, the choice of viewing software may be limited. Because of these risks, it is difficult to encourage wide adoption of proprietary standards.

Several of the systems listed in the previous section depend in whole or in part on proprietary standards. Course packs designed for Web CT, for example, cannot easily be used in competing learning management systems. It is necessary to use a content migration utility (some versions of which are no longer supported) to obtain interoperability. <http://www.webct.com/IMS>

## **Overly Strict Standards**

Even when a standard is non-proprietary, it may be the case that the standard is too limiting for widespread use. If, for example, a standard requires that only a limited type of data will be transported by a data transmission system, then novel applications using different types of data will be impossible to develop.

Much of the criticism around the Sharable Content Object Reference Model (SCORM) was focused on this sort of objection. SCORM was developed to support self-study modules designed for use by the U.S. Military. Learning objects defined using SCORM are mutually independent, meaning that only the most basic sort of sequencing is enabled. This has led critics to suggest that SCORM is not flexible enough to allow for a variety of pedagogies. (Welsch, 2002)

In a similar manner, transport protocols may also be too strict. Just as, for example, a road is much less strict (and therefore much more widely used) than a railroad, so also a distribution network that delivers only learning objects (and not, say, journal articles) is less likely to be used than a network that delivers both.

Some of the systems described in the previous section adhere to standards that are too strict. Any system requiring SCORM compliance, for example, will be viewed in this way. So also will repositories that list learning objects only, such as Merlot.

Standards may be unreasonably strict in other ways. The GNU General Public License (GPL), for example, requires that any product developed using GPL software must also be GPL. Since the GPL is intended “to make sure the software is free,” all modifications of GPL software must also be free. (GPL, 1991) While the purpose of this condition is to ensure that developers cannot convert a GPL application into a proprietary application, the interpretation is that GPL prohibits the development of any proprietary applications within a given application environment. (Microsoft, 2002)

Another issue related to the strictness of standards is the complexity of the standard in question. If the standard is too complex, use of the standard requires an involved process or development tool. Legacy content, which might have met a laxer standard, must be converted to the new standard. XrML has been criticized because of its complexity (DRM Watch, 2002) as has SCORM (Welsch, 2002).

### **Monolithic Solutions**

Under the name of “enterprise solutions,” learning content management systems have become tightly integrated monolithic software bundles. Such integration is even touted as a benefit by many software companies. Saba Software, for example, promises to “replace today’s ad hoc processes and disparate systems with a single system and a unified view of everything your organization needs...” (Saba Software, 2002)

Purchasers of such systems are as a consequence committed to a single solution for all aspects of learning management. If, for example, you do not like the discussion board or quiz generation tool in WebCT, perhaps finding it too complicated to manage (Shelanoske, 2002), there are no alternatives; third-party products cannot be simply ‘plugged-in’ to replace the WebCT default installation.

The purchase of such a system additionally requires paying for much more than may be desired. Because an essential component of learning content management systems is a database of learning objects (Nichani, 2001) a purchaser is committed to buying hardware and software support (for example, a database system such as Oracle) that may be well beyond their needs. In a tightly integrated system there is no means to deploy third-party or hosted services to manage part or the entire database; it must be located in-house.

### **Closed Marketplace**

A closed marketplace exists when an owner of a learning content management system has only a limited selection of content to choose from. This limitation occurs when the LCMS vendor reaches an exclusive agreement with a content publisher to distribute materials. Such agreements formed the bulk of press announcements through 2001 and 2002.

One of the major distributors establishing priority in learning management systems, XanEdu has reached distribution agreements with a number of vendors, including Blackboard, Fathom, Microsoft, America Online, and Gallileus.

Such agreements make it more difficult for purchasers of competing systems to obtain access to XanEdu's exclusive library. In such cases, each student must obtain a separate XanEdu account, providing credit information and paying XanEdu directly. Similar restrictions prohibit direct access to a wide variety of published content produced by other vendors.

And such agreements make it more difficult for content publishers to sell to users. Unless affiliated with a publisher (and consequently willing to accept publishers' terms and conditions), content providers are unable to make their material available for selection by LCMS users. Because LCMS content selections are offered as a bundle, often from LCMS vendors, content providers not selected to become part of this bundle are excluded from selection.

The consequence of such a Byzantine marketplace is that established publishers with large content libraries are favored. Because of the overhead involved, and because established publishers are wary of the competition, free content is discouraged and generally unavailable. This has the consequence of increased prices for content consumers.

The combination of monolithic systems and closed marketplaces tends to favor large educational institutions over smaller colleges and independent study. If it is necessary to purchase a large LCMS and pay premium prices for educational content, a smaller institution with fewer students cannot compete with institutions with enough students to distribute the cost. Independent study in such an environment is increasingly difficult, with most choices for potential students difficult to find or simply unavailable.

### **Disintermediation**

A system is disintermediated when there is no form of assessment or review guiding the selection of learning resources. The purchaser's only guide to the quality of learning material, in such a system, is obtained directly from the vendor. In a disintermediated system, there is no independent third party available to filter selection, assess or certify materials, or to comment on their potential use.

The contrary to disintermediation is intermediation. Some systems, such as merlot, attempt to provide a rudimentary form of intermediation through the provision of peer reviews of educational materials. Merlot's system, however, is closed in the sense that only a select group of people may provide reviews. And it is limited in the sense that reviewers evaluate only materials found in Merlot.

The need for some form of intermediation is evident from the numerous *ad hoc* mechanisms already in place. Such systems are typically institution-specific and involve the use of proprietary forms and assessment criteria. The system provided by dlnet, for example, provides a specific set of criteria and a review form. It is used only by reviewers rating material for inclusion in the Digital Library Network for Engineering and Technology. (dlnet, 2002)

Similar systems are employed by the Peer Review of Instructional Technology Innovation (PRTI) program in the Broadband Enabled Lifelong Learning Environment (BELLE) project and the Development of a European Service for Information on

Research and Education (DESIRE) project. (Place, 2000) In both cases, the purpose of the review is to establish a scope and selection criteria for the repository.

Systems where a review process is intended to select materials for inclusion in a specific repository may be described as “gate-keeping” services. Such services are undesirable for several reasons. First, they create significant overhead by requiring that each item be reviewed manually, causing a backlog in the addition of materials to the repository. Moreover, the results of the review are unavailable to third parties; the reviews are available only to users of a specific repository. Moreover, there is no means in such a system for third party or dissenting reviews.

In the case of many other systems, there is no review mechanism available at all. A purchaser of online articles or journal publications from a subscription service has only the article abstract available to guide selection. The reader must pay the access cost in order to determine that the abstract is misleading or that the content is not relevant.

### **Selective Semantics**

Though progress has been made recently (with, for example, the IMS Re-useable Definition of Competency or Educational Objective (RDCEO) (Kraan, 2002)), there is a tendency to view the network of learning objects and repositories as a stand-alone service on the world wide web, not integrated with or compatible with many other resources and services available.

This is an issue mostly of perception rather than implementation. It results from the presumption that an application profile, such as SCORM, is a standard, and thereby the presumption that SCORM sets out the one and only way to describe learning objects. This has been the basis for much discussion, including heated exchanges surrounding the idea that “SCORM is for everyone.” (Rehak, 2002) In fact, many application profiles, even in the educational arena, exist. (Friesen, 2002)

In fact, SCORM is application profiles, which in turn are “schemas which consist of data elements drawn from one or more namespaces, combined together by implementers, and optimized for a particular local application.” (Heery and Patel, 2000) Understood as such, it is therefore unreasonable to expect that any given application profile, even SCORM, would be widely used in multiple contexts.

The issue of selective semantics arises when a network application, such as a network of learning object repositories, standardizes on a given application profile. Such specialization restricts the usefulness of such a network to the application envisioned by the designers of the application profile, and thus precludes different (even closely related) applications. A repository network, for example, that standardized on SCORM would preclude from consideration resources that are useful to course designers, such as journal articles, but which may not be described as learning objects *per se*.

Though it is not possible to find a network designed along such principles, there is no shortage of learning content systems proclaiming themselves to be “SCORM compliant.” Viewed in this light, unless such systems are designed to manipulate RDF data, rather than only SCORM data, such systems are announcing merely that they are not suitable for a wide array of applications (though they may be ideal for environments envisioned by the designers of SCORM).

## Digital Rights Mismanagement

The issues related to digital rights management (DRM) are legion and need not be reviewed at length here. That said, since DRM will be an essential component of any network of learning object repositories, it is necessary to survey some of the major issues.

The first and probably the most significant concern is that no simple DRM solution has been widely implemented. This is because in many implementations, digital rights management has been conflated with the idea of digital rights enforcement. Thus, for example, the first widespread of proprietary electronic content required the use of specialized devices, known generically as eBooks.

Though eBooks satisfied the need to enforce digital rights, they were generally considered a failure because they required the purchase of specialized hardware and could not interoperate with anything else. As Hillesund (2001) notes, “Today there are two factors working against e-books and hindering diffusion. These factors include the overall poor quality and high prices of reading devices and the lack of proper and interoperable digital rights management (DRM) systems.” Insisting on physical control of digital materials stymies the exchange of these materials. (Lyon, 2001)

The state of digital rights management for web-based resources is not much better. In order to access content, it is typically necessary to negotiate access with each separate supplier. A person dedicated to purchasing online content, for example, may have to obtain separate accounts with Corbis (an image service; <http://www.corbis.com/>), Lexis-Nexus (a clipping service; <http://www.lexis-nexis.com/>), Salon (a magazine; <http://www.salon.com>), and so on and on. In many cases – the most notable being the online distribution of music – there is no means to obtain access to a full catalog of material.

The use of clearing houses that characterized first generation digital rights management is insufficient for the wide variety of materials and business models desired in online content exchanges. No trusted fiduciary agent, as described by Lyons (2001), exists to facilitate the exchange of learning resources. Consequently, a fractured and distrusting system of credit-card deposits, proxy servers and disabled file formats has emerged. This has resulted in content that is difficult and expensive to obtain and impractical to use.

## 4. Design Principles

### Overview

These design principles are intended to govern the development of an architecture for a distributed learning object repository network (DLORN). The purpose of the principles is to guide the description of the components employed, the standards followed, and the principles governing the operation of the network.

These principles are in one sense descriptive and in another sense prescriptive. They are descriptive in the sense that they attempt to capture the essential elements of what is likely to be the most successful system for the distribution and use of learning materials on the internet. They are prescriptive in the sense that they are intended to inform the development of such a network.

## Open Standards

The protocols used by components of the components of DLORN to communicate with each other and with external systems are described, documented, and freely available to the public at large. The purpose of this principle is to encourage the development of complimentary systems that may interact with and support the functionality of DLORN.

For example, a DLORN should embody interoperability with other networks and systems that are being developed by libraries and museums worldwide. In other words, the DLORN is not a network with own proprietary communication protocols open to only repositories within system but can operate with others outside systems such as the Open Knowledge Initiative (OKI; <http://web.mit.edu/oki/>) and to be aware of other communications protocols, such as Z 3950 (Miller, 1999), to augment its own information objects with those from other collections.

## Royalty-free Standards

The standards developed or used by DLORN shall be royalty-free. The purpose of this standard is to ensure that there is no *a priori* overhead cost incurred by agencies wishing to offer services compatible with DLORN. Imposing an *a priori* cost immediately poses a barrier to small and medium sized enterprises that may wish to participate and it biases the network toward the provision of commercial content only.

### *Enable, Don't Require*

Where possible, DLORN will not require adherence to a particular constraint, but rather, will allow users of the system to exercise options among various models. The design of the system will be to allow systems that exercise different options to interoperate and to work within the same space.

This principle is essentially based on the idea of defining different levels of compliance required for interoperability within the network as a whole than would be required by specific instances of the system. At the network level, a minimal standard is desired in order to achieve the widest functionality possible. One way of stating this is to require interoperability at the syntactical level only, without stipulating as to the content being exchanged.

This need must be balanced against the need for a more robust interoperability, one that requires a common understanding of meaning as well as sentence structure. Although interoperability is possible, if the agreement consists of syntactic structures only, such interactions are functionally meaningless. Greater agreement is desired, and the greater the level of semantic agreement within two systems, the greater the interoperability.

In practice, what this means is that although the network as a whole imposes no prior semantic restrictions, in order to use the network it is necessary that *some* semantical agreement is required for two instances to interoperate within this framework. In other words, though the network imposes no restrictions on how something is described, evaluated, valued, or transacted, entities within the network must define how these are to be described. [1]

## **Open-Source Infrastructure Layer**

The infrastructure layer is the set of components that provides end-to-end functionality for DLORN. It is described in the paper *Distributed Learning Object Repository Network Infrastructure Layer* (forthcoming). The set of components in the infrastructure layer will be developed and distributed as royalty-free open source software. The purpose of this principle is to demonstrate functionality without requiring financial advances, and to provide a base of functional components on which other services and applications may be developed.

## **Open or Proprietary Service Layer**

Over and above the infrastructure layer, it is hoped and anticipated that third parties will develop components with increased functionality, offering an improvement in design or services over and above the functionality provided by the infrastructure layer. Such components may be developed as free and open applications, or they may embody commercial and proprietary components. The purpose of this principle is to enable the development of commercial applications that generate a revenue stream for software developers and service providers.

## **Component Based Architecture**

The DLORN is to be designed not as a single software application, but rather, as a set of related components, each of which fulfills a specific function in the network as a whole. This enables users of the DLORN to employ only those parts of DLORN that suit their need, without requiring that they invest in the entire system. It also allows for distributed functionality; a user of DLORN may rely on a third party to provide services to users. The purpose of this principle is to allow for specialization. Additionally, it allows users of DLORN to exercise choice in any of a variety of models and configurations.

## **Distributed Architecture**

Any given component of DLORN may be replicated and offered as an independent service. Thus, it is anticipated that there will be multiple instances of each component of the DLORN infrastructure. The purpose of this principle is to provide robustness. Additionally, it is to ensure that no single service provider or software developer may exercise control over the network by creating a bottleneck through which all activities must pass.

## **Open Access**

Any provider of learning materials may prepare and distribute learning materials through DLORN. Though DLORN will support the registration and indexing of various providers, this registration will be free and optional. The purpose of this principle is to ensure that providers are not faced with *a priori* 'membership fees' or similar tariffs in order to gain access to potential purchasers. This does not preclude restrictions, tariffs or controls on specific instances of a DLORN component. However, in any case where a restricted component, such as a for-profit metadata repository, exists, an equivalent unrestricted component, such as a public metadata repository, will also exist.

## **Open Market**

There will be no prior restraint imposed on the distribution model selected by participants in DLORN. Specifically, DLORN will accommodate free content distribution, co-op or

shared content distribution, and commercial fee-based content distribution. The purpose of this principle is to ensure fair and open competition between different types of business models, to ensure that users of DLORN are not 'locked in' to the offerings provided by certain vendors, to provide the widest possible range of content options, and to ensure that prices charged for learning content most accurately reflect the true market value of that content.

### **Standards Tolerance**

DLORN imposes no prior restraint on the metadata standards used by participants to describe given resources or services. Metadata repositories are tolerant of different standards employed by different providers of learning materials. Metadata repositories also (attempt to) provide output in the standard requested by users of the system. This means, for example, that a vendor may elect to employ IEEE-LOM to describe its learning materials, while a consumer may request information in the form of the CanCore profile. Standards tolerance extends to the description of digital rights, classification and taxonomies, and evaluation and annotation. The purpose of this principle is to enable an inclusive marketplace, to reduce risk by vendors when metadata standards are selected, and to enable the development of vendor-specific or custom metadata for particular uses.

### **Multiple Channels**

The description of DLORN will include descriptions for communication using multiple channels or multiple modes of communication. For example, DLORN will enable requests using web services such as XML-RPC or SOAP, gateway interfaces such as HTTP-POST, and harvesting protocols such as OAI. The purpose of this provision is to enable redundancy in the system. It is also to reduce the liability of the network should any given standard become a royalty-based standard. It is also to provide software developers the greatest range of options for the creation of new services.

### **Multi-Party Metadata**

Multiple parties may provide metadata describing a given learning resource. There is no prior restraint exercised by providers of learning materials on evaluations, appraisals, comments and other fair descriptions of their learning material. The purpose of third party metadata may be to provide alternative classification schemes, to indicate certification compliance, or to provide independent assessments and evaluations of learning resources. The purpose of this principle is to ensure that potential users of learning resources to obtain neutral descriptions of that material. It is also to create an environment for the creation of optional but value-added third party services for which fees or other costs may be charged.

### **Integration with the Semantic Web**

DLORN should be considered as an implementation of and an extension of the semantic web. This means that DLORN metadata data and services would be available to the semantic web as a whole. It also means that DLORN can and should incorporate elements of the semantic web, such as sector-specific ontologies, into its own design. The purpose of this principle is to ensure that DLORN is capable of the widest reach possible. It is also to reduce the duplication of effort between developers working in specific domains and educators working in the same domain.

## **Multiple Data Types**

No prior restrictions are imposed on the data types to be transported through DLORN. This includes but is not restricted to various content formats, proprietary or otherwise, such as HTML, and the like. This provision is also intended to allow learning resources that are not learning objects, as variously defined, to circulate through the system. For example, academic papers distributed through the Open Archives Initiative, news articles distributed through various vendors, conference, class or seminar registration and information may also be distributed through DLORN. The purpose of this proposal is to enable any learning resource, including in-person learning services, to be accessed, and not merely a specific subset of learning resources.

### *Simple Digital Rights Management (DRM)*

The principle behind fee-based and subscription-based transactions is that it should be easier to buy material than to steal it. Thus where possible, the acquisition of rights and the exchange of funds will be automated. The purpose of this principle is to reduce transaction and clearance costs for purchasers of learning materials.

## **Brokered DRM**

Transactions within DLORN are brokered. That is, typically, a given provider of learning materials will work with a single agent who sells to multiple purchasers, and a given user will work with a single agent who conducts transactions with multiple vendors. Vendors and users may select from any number of brokering services, so that no single transaction agent controls the network. Vendors and purchasers may act as their own agents. A vendor or purchaser may elect to employ multiple agents. Agencies acting on behalf of, say, a provincial department of education, may act as agents for a given populations, such as the students of that province. The purpose of this provision is to eliminate the need for the creation of multiple accounts, to allow users to user resources from multiple vendors, and to provide a choice of agents, and therefore a greater likelihood of trust.

## **Permission Based**

This principle states in effect that users of the system own their own personal data. The user's agent operates on behalf of the user, and releases information or money only with the agent's explicit consent. The purpose of this principle is to engender trust in the system and to ensure privacy when dealing with multiple agencies.

## **5. The Distributed Network**

### **A network rather than a (single) system**

What we are proposing is a set of inter-related applications distributed over the internet and communicating with each other. This seems to me to be the single major factor distinguishing our approach from other approaches as defined in IEEE/P1484.1/D9 of IMS Repositories. This is accomplished in three major steps:

- a. Separating the functionality of an LCMS / LMS architecture into distinct, stand-alone components that communicate over TCP/IP
- b. Allowing (encouraging) the development of multiple instances of these components
- c. Providing indexing or registries of these instances

Thus, for example, instead of envisioning a single metadata repository that indexes all learning objects (or, as we see within common practice, all learning objects within a specific domain, such as a geographic region or company), we envision multiple learning object repositories that may or may not focus on a particular domain.

In other words, the model we are envisioning resembles much more the model employed by the World Wide Web than it does the model envisioned by a content management system. In my opinion, this is a key turning point.

### **Core Components of the Network**

- a. Learning Object Repository - hosted by vendors on vendor sites, provides vendor metadata and learning object servers
- b. Metadata Repository - hosted elsewhere, harvests metadata from vendors and amalgamates, allows queries from eLearning systems. Norm Friesen has written a useful backgrounder on harvesting: <http://www.cancore.ca/harvesting.doc>
- c. eLearning system - queries metadata repository, user selects resource, retrieves resource from learning object repository, displays

This core functionality is relatively simple and is already established in other domains, for example, in news syndication. Consider the following combination of components:

- a. News Object Repository - Original articles are posted on news site and RSS metadata is available for harvesting
- b. Metadata Aggregator - such as NewsIsFree collects metadata, indexes (maybe) and provides (topic-specific, sometimes) search
- c. News Viewer - such as Amphetadesk - accesses the aggregator for an index, then retrieves the selected item from the news repository

### **Contrast to Library Model**

Most other implementations, including IEEE/P1484.1/D9, employ a model whereby learning materials are akin to books in a library (or, in some other way, 'content' to be managed). Consequently, they envision that implementations of the architecture will access collections of this content, typically (but not always) stored on location. The process they envision is therefore:

- a. Acquire the content
- b. Index or classify the content
- c. Deploy the content

In a network model, there is no need to manage collections of content. So instead of working with learning objects specifically (as defined by

IEEE/P1484.12.1 or pick your specification) the network works more generally with what may be called learning resources, or even more precisely, learning opportunities. This includes, but is not limited to:

- a. Learning objects, properly so-called
- b. Other academic works, such as journal articles
- c. In-person classes or seminars
- d. Instructors, coaches and tutors

While it is permissible to search for a specific category of learning opportunities, such as a learning object, the design does not require that all resource fit that particular category. This is enabled by tolerating the use of different schemas in learning object repositories.

Learning opportunities in this model should therefore more accurately be thought of as akin to 'processes' rather than 'things'. The desired result of, say, a learning object search system is not so much to *acquire* a resource as it is to *locate* it and, when appropriate, display it or run it.

Part or all of the learning resource may or may not be cached on location, but this is left to the discretion of the particular instance and is not a defining feature of the system.

### **Component Registry Services**

In the network proposed, there are multiple instances of each component. Of course, there are multiple learning objects. But there is in addition multiple learning object repositories (typically, one for each learning object vendor) and multiple metadata repositories.

In order to provide access to these resources, it is necessary to provide indexing or registry services. The purpose of these services is multifold:

- a. To provide a list of the available instances
- b. To establish and verify ownership of these resources, for the purpose of maintaining or updating information about them in the system

For example, consider the list of learning object repositories. A vendor wishing to offer learning objects through the network will need to declare that the repository exists and where to find the list of available resources. By registering the repository, the vendor is able to make its presence known and to ensure that important information – such as its URI – will not be changed by third parties.

The registry system envisioned is consistent with existing approaches to the provision of services on the internet. It is anticipated that the repository indexing service would resemble the UDDI and WSDL protocols.

Norm Friesen has written a useful discussion regarding the registration and indexing of resources. <http://www.cancore.ca/Resourceids.doc>

### **Functionality of the System versus Functionality of the Learning Resource**

Many models of learning object architecture presuppose that the system being deployed contains a great deal of functionality. For example, IEEE/P1484.1/D9 includes as two (of the four) essential components the 'coach' function and the 'evaluation' function. A wide variety of other functions are embedded in LMS and LCMS design, for example, class registration, discussion and chat.

The weakness of this approach is that the purchaser of an LMS or LCMS is restricted to only one choice in the delivery of these functions, that is for example, restricted to only one discussion board or one class registration system. This makes LMS and LCMS systems needlessly complex, and needlessly restricts the range of options available to the purchaser. Thus, such functionality is envisioned in this model to reside in the learning opportunity, thus greatly increasing the range of choice available to developers.

This functionality of the system is therefore defined in the learning opportunity, rather than in the system itself. This is the most immediate and obvious difference between this approach and IEEE/P1484.1/D9. In the IEEE draft standard, elements such as 'coach' and 'evaluation' are defined as components of the architecture. On this model, they are resources that may be deployed within the architecture.

### **Secondary Components**

In addition to the three core elements, a number of secondary elements are also required in order to meet a number of the objectives of learners, learning institutions and content providers. As in the case of the core components, there may be multiple instances of any secondary component. This allows users of any core component to exercise choice in the selection of secondary components. These components include:

- a. A system of third-party metadata
- b. A digital rights system
- c. A learner (user) information system
- d. A reporting or tracking system

What is significantly different about this model and models envisioned in IEEE/P1484.1/D9 and IMS Repositories is that:

- a. The components are optional: you develop (or buy) them and use them only if you need them
- b. For any given component, you may select one of many instances
- c. These components may reside outside your own system

As in the case of the primary components, a registry service is developed for each type of secondary component.

### **Third Party Metadata**

Third-party metadata is a crucial component of the network that is not really envisioned by IEEE-LOM or IMS (though to be fair they do permit reference to third party ontologies, as in IEEE/P1484.12.1 9.21 and 9.22. See <http://www2002.org/CDROM/alternate/744/index.html> for some description and uses of third party metadata.

The core principle of third party metadata is that there may be multiple metadata files, perhaps even located on different hosts, written by different authors (some for-profit), that describe a single learning resource.

For example, a single learning resource may have associated with it:

- a. A description, in IEEE/P1484.12.1, created by the author or owner of the learning object
- b. An indication of certification, using a specialized metadata schema, provided by a professional association
- c. Metadata containing a review (or a reference to a review), provided by a public service agency
- d. Digital rights information, authored by and hosted by a DRM handling company
- e. Classification of the object, authored and hosted by a library authority

## **Digital Rights Management**

A principle objective of the digital rights system (DRM) enabled by the network is to create a system where multiple suppliers work through a common interface. To enable this, it is important to provide a choice of business models. A business model consists of two essential components:

- a. The definition of the business rules, and
- b. The application of the rules in software functionality

In traditional DRM, the definition of business rules is represented in specific DRM metadata. Two major approaches exist, ODRL and XrML, though numerous sub-variants exist. These approaches are XML schemas defining the allowable documentation of specific rights for a specific (group of) learning object(s). See <http://xml.coverpages.org/drm.html>

In order to establish DRM for a given learning resource, the metadata associated with this resource identifies the metadata, usually managed by a third party (see below), defining the DRM associated with the learning resource.

### **Beyond Digital Rights Management: Employee/Consumer Rules**

Most examinations of DRM deal in general with the application of business rules to learning object transactions. For the most part, these are rules established by the content owner or vendor. But it is important to look beyond the traditional formulations whereby all the rules are established by the vendor. Classes of employee/consumer rules will also be identified and handled by different parts of the system.

An approach similar to DRM is taken for the definition of employee/consumer rules. Using a (n as yet undefined) XML schema, the various employee/consumer rules, such as the ones you have listed above, are defined in an XML file owned by the employee/consumer. This file may be maintained by a personal information service or buyer's agent (several such files may exist to handle different aspects of employee/consumer rules - for example, pricing, personal information, financial information and presentation will likely be located in different files, handled by different systems).

These rules are applied by various subsystems: the metadata repository, the learning object retrieval system, and the viewer itself.

### **Employer Rules**

Employer rules are established using the same system as employee/consumer rules. By 'employer' in this document we could also include entities such as school boards, colleges or universities, professional associations, and indeed, any third party given permission by the employee or consumer to apply rules.

During processing, if employer rules apply (a consumer/employee uses the same system for job training as, say, hobby learning), then the employer rules are merged with the consumer/employee rules. They are then applied in the subsystem as appropriate.

### **Learner / User Information System**

An additional secondary component is a set of learner information systems. The concept is similar to the 'resume' or 'portfolio' system described by Chuck Hamilton of IBM

## Notes

[1] This paragraph was significantly informed by Norm Friesen and Toni Roberts.

## References

- Chen, Si-Shing. 2001. NBDL (National Biology Digital Library). Slide Presentation. <http://www.cni.org/tfms/2001a.spring/handout/Progress-SChen2001Stf-NSF.ppt>
- Dlnet. 2002. Guidelines for the Reviewer. National Science Digital Library. <http://www.dlnet.vt.edu/ReviewerGuidelines.jsp>
- DRM Watch. 2002. XrML 2.0 Review. Giant Steps Media Technology Strategies. <http://www.giantstepsmts.com/DRM%20Watch/xrml20.htm>
- GPL. 1991. The GNU General Public License. Version 2. <http://www.opensource.org/licenses/gpl-license.php>
- Ellis, Ryann K. 2001. LCMS Roundup. Learning Circuits. <http://www.learningcircuits.org/2001/aug2001/ttools.html>
- Friesen, Norm. 2002. Survey of Learning Object Metadata Implementations. CanCore. <http://www.cancore.ca/lomsurvey.html>
- Heery, Rachel and Patel, Manjula. 2000. Application profiles: mixing and matching metadata schemas. Ariadne. 25. <http://www.ariadne.ac.uk/issue25/app-profiles/>
- Hillesund, Terje. 2001. Will E-Books Change the World? First Monday, Volume 6, Number 10. [http://firstmonday.org/issues/issue6\\_10/hillesund/index.html](http://firstmonday.org/issues/issue6_10/hillesund/index.html)
- Institute of Electrical and Electronics Engineers, Inc. 2002. Draft Standard for Learning Object Metadata (IEEE P1484.12/D6.1). [http://ltsc.ieee.org/doc/wg12/LOM\\_WD6-1\\_without\\_tracking.htm](http://ltsc.ieee.org/doc/wg12/LOM_WD6-1_without_tracking.htm)
- Jack, Hugh. 2001. DG: 18.2.1 Proprietary “Standard” Formats. Design Engineer on a Disk. <http://claymore.engineer.gvsu.edu/eod/design/design-167.html>
- Kraan, Wilbert. 2002. Objective Re-Usable Competency. CETIS. <http://www.cetis.ac.uk/content/20021101143354>
- Lyon, Gordon. 2001. The Internet Marketplace and Digital Rights Management. <http://www.itl.nist.gov/div895/docs/GLyonDRMWhitepaper.pdf>
- Merlot. 2002. Merlot Peer Review. <http://www.merlot.org/home/PeerReview.po>
- Microsoft Corporation. 2002. Microsoft Shared Source Philosophy: Frequently Asked Questions. <http://www.microsoft.com/licensing/sharedsource/ssfaq.asp>
- Miller, Paul. 1999. Z39.50 for All. Ariadne. 21. <http://www.ariadne.ac.uk/issue21/z3950/intro.html>
- National Communications System. 1996. Telecommunications: Glossary of Telecommunications Terms. <http://www.its.bldrdoc.gov/fs-1037/fs-1037c.htm>

- Nichani, Maish. 2001. LCMS = LMS + CMS (RLOs). ELearningPost.  
<http://www.elearningpost.com/features/archives/001022.asp>
- Oregon State University. 2002. Baccalaureate Core Course Equivalencies.  
[http://www.orst.edu/Dept/admindb/arttable/scr1140\\_arttab.htm](http://www.orst.edu/Dept/admindb/arttable/scr1140_arttab.htm)
- Saba Software. 2002. Saba Learning, Enterprise Edition.  
[http://www.saba.com/english/products/pdf/Saba\\_Learning\\_Ent.pdf](http://www.saba.com/english/products/pdf/Saba_Learning_Ent.pdf)
- Place, Emma. 2000. Quality selection: ensuring the quality of your collection. DESIRE information gateways handbook. <http://www.desire.org/handbook/2-1.html>
- Rehak, Dan. 2002. SCORM is not for everyone. CETIS.  
[http://www.cetis.ac.uk/content/20021002000737/index\\_html](http://www.cetis.ac.uk/content/20021002000737/index_html)
- Shelangoske, Susan. 2002. Beginning WebCT Instruction: Lesson 4, Quizzes and Grading. Cleveland State University.  
[http://www.csuohio.edu/a\\_and\\_s/webct/pdf/lesson4pt1.pdf](http://www.csuohio.edu/a_and_s/webct/pdf/lesson4pt1.pdf)
- Welsch, Edward. 2002. SCORM: Clarity or Calamity. Online Learning Magazine.  
[http://www.onlinelearningmag.com/onlinelearning/magazine/article\\_display.jsp?vnu\\_content\\_id=1526769](http://www.onlinelearningmag.com/onlinelearning/magazine/article_display.jsp?vnu_content_id=1526769)
- XanEdu. 2002. Press Releases. <http://www.xanedu.com/company/pressroom/press.shtml>
- You, Jee Young. 2001. Click and Learn: Fathom. Silicon Alley Daily.  
<http://www.siliconalleydaily.com/issues/sar08132001.html>

## About the Author

Stephen Downes is a senior research officer, Institute for Information Technology, National Research Council, Moncton, New Brunswick, Canada. Mr. Downes specializes in research in online learning, online communities, and knowledge management. He is USDLA Journal's Editor-at-Large. He may be reached at: [stephen@downes.ca](mailto:stephen@downes.ca). Some of his work and research may be accessed as listed below:

- Author/publisher, OLDaily, a daily newsletter:  
<http://www.downes.ca/news/OLDaily.htm>
- CTO, NewsTrolls:<http://www.newstrolls.com~downes@newstrolls.com>
- Section Editor, The Technology Source: <http://horizon.unc.edu/TS/>

**Editor's Note:** This is Dr. Brent Muirhead's 16<sup>th</sup> submission in the past three years. Dr. Muirhead is not only a regular contributor, he is Journal Editor for Online Learning and Reader for refereed articles. His theme this month reflects the distress in the business and political sectors that also impacts education and distance learning. It is an opportune time to put our personal and political differences aside, to evaluate ourselves and revisit our responsibility to learners and the distance learning community.

## Ethical Distance Education Leaders

Brent Muirhead

The focus of this discussion will be on the importance of having ethical distance education leaders who creatively empower their employees to promote greater productivity. Educating adults is a vital business that requires capable leaders who are conscious of their need for continuous professional growth.

### Why Do Companies Fail?

The American business failures of major Fortune 500 companies like Enron during the past year and a number of business scandals have generated an increase in public concern about the quality of today's leaders. A basic question people ask is, "Why do major companies fail?" Naturally, contemporary CEOs are quick to offer an assortment of excuses such as a weak economy or stock market problems.

Financial experts might look at the American economic system for possible reasons for the business failures. In capitalism philosophy, it is possible to find economic arguments to support the notion that only the companies that serve a useful purpose will survive. The demise of numerous dot-coms may reflect experimental business ideas that were not effective in serving their target market.

It is important to look at the business landscape in light of the recent economic trends. Charan & Useem (2002) note that the latest bear market created a situation that

*"...26 of America's 100 largest corporations lost at least two thirds of their market value, including such blue chips as Hewlett-Packard, Charles Schwab, Cisco, AT&T, AOL Time Warner, and Gap. In the 1990 bear market, by contrast, none did, according to money management firm Aronson & Partners (p. 52)."*

Distance education schools can learn from the business mistakes made by other organizations within and outside of the educational arena. The rising costs and attrition rates for distance education students are well documented. Charan & Useem (2002) share ten reasons why even apparently successful organizations experience major employee firings, dramatic loss of stock values and other major negative events:

1. Leaders who are enamored by their success and fail to ask the tough questions.
2. Leaders who see no evil and ignore the negative reports about their company.
3. Leaders who have a greater fear of their boss than their competition.
4. Leaders who take excessive risks with their financial resources.
5. Leaders who have been consumed by making undisciplined company acquisitions.
6. Leaders who listen more to the Wall Street analysts than their employees.

7. Leaders who rely on quick fixes for major problems.
8. Leaders who foster a company culture that lacks accountability.
9. Leaders who cannot handle negative news and let the company fall into a death spiral.
10. Leaders who are led by a dysfunctional board.

For distance education, these translate to lack of administrative support, faculty negativity, overworked support staff, and high technology costs. The list contains a diversity of problems and highlights the importance of having leaders who create a system of accountability that represents the interests of major stakeholders. Ultimately, company oversight must come from leaders who are competent, visionary and ethical in their daily activities (Charan & Useem, 2002). This is equally true of education, and especially pertinent in the distance learning arena.

### **Ethical Leadership**

The term ethics comes from the Greek word *ethos*, which has been translated into a variety of terms such as disposition, manners and character. Angeles (1992) defines ethics as

*“1) the analysis of concepts such as ought, should, duty, moral rules, right, wrong, obligation, responsibility, etc., 2) the inquiry into the nature of morality or moral acts., and 3) the search for the morally good life (p. 92).”*

The definition reveals that the term ethics has a multidimensional nature that transcends simple descriptions.

The issue of ethics must be viewed within the context of contemporary cultural trends and attitudes. The constant stream of political and business scandals has created a “crisis of heroism.” Today, a growing media cynicism towards contemporary leaders has fostered attitudes that deny the possibility of human greatness. It is not surprising that today’s young people have embraced rock stars and professional athletes who represent the morally neutral heroes – people who have obtained their apparent social greatness due to talent that is independent from any moral virtue. In fact, some youth are attracted to a form of immoral heroism that admires those who freely practice sexual promiscuity, become financially rich through exploiting others, and people who use violence for achieving justice (Keys, 1995).

Americans might be cynical at times, but they still want leaders who operate by high ethical standards and are not consumed by making money. What is an accurate description of an ethical leader? Trevino, Hartman & Brown (2000) share that “a reputation for ethical leadership rests upon two essential pillars: perceptions of you as both a moral person and a moral manager.” (paragraph 2) The definition begins with the executive being a moral person that has positive character traits (i.e. integrity), behaviors (i.e. concern for people) and decision making skills (i.e. objective). Also, the definition stresses the importance of leaders communicating values by being role models and developing a management system that consistently rewards acceptable behavior and disciplines unacceptable behavior. Ethical leaders provide the guiding force to move an

organization toward greater accountability by matching words about values with visible actions that demonstrate respect for every employee (Trevino, Hartman & Brown, 2000).

The dark side of leadership is represented by individuals that rise to power and fame but their success is built on a faulty foundation. Al Dunlap is cited by business experts as an example of an unethical leader who lied about serious financial problems at Sunbeam and emotionally abused his employees. Dunlap was well-known for helping struggling companies become profitable, but his fame came at a high price. Dunlap earned the nickname “chainsaw” because he was known for firing thousands of employees to boost stock prices.

Byrne (1999) paints a tragic picture of Dunlap’s business behavior,

*“In Dunlap's presence, knees trembled and stomachs churned. Underlings feared the torrential harangue that Dunlap could unleash at any moment. At his worst, he became viciously profane, even violent. Executives said he would throw papers or furniture, bang his hands on his desk, and shout so ferociously that a manager's hair would be blown back by the stream of air that rushed from Dunlap's mouth. ‘Hair spray day’ became a code phrase among execs, signifying a potential tantrum (paragraph 4, under head dead computers).”*

### **Developing Trust: The Foundation of Leadership**

Ethical leadership does not arise out of a social vacuum. Rather, it follows from a lifestyle of a leader who considers his/her role as vital to the moral health of the organization. Yes, some leaders are not comfortable with the idea of being role models but they are ones regardless of their feelings. Maxwell (1998) notes that to build trust, a leader must exemplify competence, connection, and character (p. 58).” This is the essence of an ethical leader.

Distance education schools can cultivate ethical leadership and offer competitive academic programs without sacrificing their obligations to their employees. One of the greatest challenges that contemporary leaders face is demanding commitment from their employees without offering much long term security. The current economic environment lacks the stability to make many promises about long-term future employment. This sobering reality will demand making changes in governance strategies. It is time for more organizations to make political reforms that support stewardship principles while experimenting with ways to redistribute power and privilege. This is a visionary approach to leadership that is service oriented and built upon empowering employees to work as business partners. Block (1993) states:

*“A governance based on stewardship’s mixture of accountability with partnership, empowerment, and service will give us the means for taking experimental programs and pocketed successes we now have in our hands and making them more widespread and ingrained as a way of doing business (p. 22).”*

### **Personal Leadership Agenda**

A serious ethical discussion should encourage individuals to make changes in their lives. It will require making a deliberate choice to plan and pursue a new set of ethical goals.

Leaders must ask at least three basic questions for creating a new personal leadership agenda:

- Ask yourself this question, what behaviors or attitudes do you wish to change?
- What barriers do you face in making meaningful changes?
- What support can you rely upon to help you make these changes?

### **The Seven Cs of Success**

Morris (1994, p. 286) has developed seven principles of success that are quite useful in helping individuals to formulate new goals for their personal and professional lives.

1. We need a clear **conception** of what we want, a vivid vision, a goal or set of goals powerfully imagined.
2. We need a strong **confidence** that we can attain our goals.
3. We need a focused **concentration** on what it takes to reach our goal.
4. We need a stubborn **consistency** in pursuing our vision, a determined persistence in thought and action.
5. We need emotional **commitment** to the importance of what we're doing, and to the people with whom we're doing it.
6. We need a good **character** to guide us and keep us on a proper course.
7. We need a **capacity** to enjoy the process along the way.

The seven principles can be a good check list for leaders to develop a professional growth plan to create a new set of goals. A key question will always involve commitment to the new goals. How can leaders improve their level of commitment?

- Measure personal commitment by examining how much time and energy that you devote to something that you consider important in your life. Do your activities support your goals?
- Understand what goals are worthy of great personal sacrifices.
- Share your goals with others to help you become more dedicated to completing a project (Maxwell, 1999).

“But success landmarks are internal, not external. They mark changes in you—in your thinking and attitudes—that are reflected outwardly in how you act (Maxwell 1997, p. 145).”

### **Conclusion**

Distance education leaders are challenged by living in a new era of economic realities. Americans have lost a degree of confidence in their leaders and institutions. Bronson (2003) observes that “we’ve been seduced by the idea that picking up the pieces and simply tweaking the formula will get the party started again. In spite of our best thinking and most searing experience, our ideas about growth and success are mired in a boom-bust mentality (p. 72).

Education is not immune from political interference, lack of support and understanding, indifference, greed, and other ills of our social systems. We see the problems of business and politics reflected in our universities, colleges, school systems, and governing boards, whether public or private, and in county, state and federal departments of education. We see lack of support and understanding for the needs of teachers and students; we see budgetary decisions based on political or financial gain, and we see the public trust subverted in a search for power.

Ethical leaders make a positive difference in lives of others because they are thinking and working for a common good. They are part of a learning organization. They are not concerned with status and power. They are servant leaders who foster trust and integrity. Their influence is positive and transcends their job. They create a good name for their academic or training institution. They establish honest and responsible relationships with the stakeholders – government, business, and community – public and private – organizations and individuals – and especially with teachers, students, parents, administrators, employees, and community leaders.

## References

- Angeles, P. A. (1992). *Dictionary of philosophy (2<sup>nd</sup> ed.)*. New York, NY: Harper Collins.
- Block, P. (1993). *Stewardship: Choosing service over self interest*. San Francisco, CA: Berrett-Koehler Publishers.
- Bronson, P. (2003, January). What should I do with my life? The real meaning of success---and how to find it. *Fast Company*, pp. 68-79.
- Byrne, J. A. (1999, October 18). Chainsaw. *Business Week*. Issue 3651, pp. 128-149. Retrieved from EBSCO December 29, 2002. <http://www.apollolibrary.com/collections.asp>
- Charan, R. & Useem, F. (2002). Why companies fail. *Fortune*, 145 (11), pp. 50-62.
- Keys, D. (1995). *True heroism: In a world of celebrity counterfeits*. Colorado Springs, CO: NavPress.
- Maxwell, J. (1999). *The 21 indispensable qualities of a leader*. Nashville, TN: Thomas Nelson.
- Maxwell, J. (1998). *The 21 irrefutable laws of leadership*. Nashville, TN: Thomas Nelson.
- Maxwell, J. (1997). *The success journey: The process of living your dreams*. Nashville, TN: Thomas Nelson.
- Morris, T. (1994). *True Success: A new philosophy of excellence*. New York, NY: G. P. Putnam's Sons
- Trevino, L. K., Hartman, L. P., Brown, M. (2000). Moral person and moral manager: How executives develop a reputation for ethical leadership. *California Management Review*, Vol. 42 (4), pp.128-142. Retrieved from EBSCO May 15, 2002. <http://www.apollolibrary.com/collections.asp>

## About the Author



**Brent Muirhead** has a BA in social work, master's degrees in religious education, history, and administration, and doctoral degrees in Education (D.Min. and Ph.D.).

Dr. Muirhead is the area chair for the MAED program in curriculum and technology for the University of Phoenix Online (UOP) and teaches a variety of master level courses. He also trains and mentors faculty candidates, conducts peer reviews of veteran faculty members, and teaches a variety of courses in UOP's Doctor of Management program. He is an Associate Editor for Educational Technology & Society. He may be reached via email: [bmuirhead@email.uophx.edu](mailto:bmuirhead@email.uophx.edu)

**Editor's Note:** This is an interesting study on the anatomy of distance learning from the perspective of involved students, faculty, technologists, administrators and support staff. This is a good system study that highlights the complexities, human and technical, within the evolution of distance learning.

## **Socio-Technical System Advancements: Making Distance Learning Changes That Count**

**Denise Land, Anthony Nwadei, Scott Stufflebeam, Cyril Olaka**

### **Introduction**

*“Let the Knowledge Olympics begin. The torch of e-learning is ablaze”*

(Bersch, 2001, p. 32).

The distance-learning environment taps innovative technologies to offer flexible and engaging adult learning opportunities. Students engaged in distance learning are able to learn anytime, anywhere, in a collaborative learning community. Online learning promotes the globalization of adult learning by opening the boundaries of learning (Neo & Eng, 2001).

This review of student suggestions regarding socio-technical redesign of distance learning venues to optimize human and technical resources, including the identification of associated learning benefits, provides a needed assessment of distance learning configuration. In addition, the authors present an analysis of anticipated reactions to conditions necessary for successful introduction of change.

### **Systems Theory Overview**

In the 1950's, German biophysicist Ludwig von Bertalanffy introduced general systems theory based on the assumption that essential principles of system relationship governed and explained the relationships amongst and between the interrelated aspects of a system (Hatch, 1997). “Each part is conceived as affecting the others and each depends upon the whole” (Hatch, p.35). The two primary tenets of the general systems theory include the notion that the theory is relevant and applicable to any thing science can study, and that all systems can be divided into analyzable parts for the purpose of study, however their true systems essence can only be studied as a holistic system. “The implication is that, to comprehend a system, you must not merely analyze, you must also be willing to transcend the view of the individual parts to encounter the entire system at its own level of complexity” (Hatch, p.35). Online academic distance learning arenas, associated school administration, instructional facilitation, technological mechanisms, and students are accurately considered a system.

Bertalanffy (1968) stated that “systems theory is a broad view which far transcends technological problems and demands, a reorientation that has become necessary in science in general and in the gamut of disciplines from physics and biology to the behavioral and social sciences and to philosophy” (p. vii). Systems theory allows understanding of the structure and dynamics of all systems, allowing for the observation of relationships between various elements of a system viewed holistically versus elementally segregating isolated aspects of the overall system (von Bertalanffy, 1968). Systems philosophy is the “reorientation of thought and world view ensuing from the introduction of “system” as a new scientific paradigm (in contrast to the analytic, mechanistic, one-way causal paradigm of classical science)” (von Bertalanffy, 1968, p. xxi).

## **Suggested Socio-technical Modifications**

Employment markets and employee positions of the present day and future challenge individuals to have greater, more comprehensive skill capacities and abilities, therefore higher education organizations are experiencing increased demand for a larger variety of rapid paced educational resource options for the adult learning community. “Within a context of rapid technological change and shifting market conditions, the American education system is challenged with providing increased educational opportunities without increased budgets” (Willis, guide 1, 2002). Many universities offer the adult learning community a technology based option for gaining institutionally provided learning experiences previously confined to the traditional classroom arena. The benefits of e-learning include: a) instantaneous materials access; b) convenience; c) improved learning retention; d) real-world application; e) practicality, flexibility and learning consistency; f) just-in-time information for career-active students; g) global incorporation of new concepts; h) minimal disruption of family and work life responsibilities; i) elimination of space, time and geographical constraints; j) increased peer interaction due to the collaborative learning environment; k) increased interaction with more accessible teachers; l) increased quality of learning with deeper critical reflection; and, m) increased access to information and other resources not available in traditional environments.

The distance-learning environment is never static, but reflects the dynamism of the learning communities. The dialog of the online classroom stimulates the learning environment in which students interact with each other to expand their ideas via electronic forums and communication tools such as learning group discussions, bulletin boards, Internet relay chat, newsgroup discussion, E-mails, etc. (Atwong et al, 1996; Natesan & Natesan, 1996; Seibert 1996; Siegel, 1996). The e-learning model assumes that learning is a social activity and learners tap the learning network to verbalize their thoughts. The technological advantage of online classrooms promotes active group learning through technology-mediated dialogs (Cordell, 1996). There is never a dull moment online due to the interactive nature of collaborative learning. In addition, the somewhat impersonal online medium promotes greater student reflection. For the student, online learning provides: a) greater cognitive development; b) critical thinking skills to challenge assumptions; c) exploration to further professional practice; d) empowerment of professionals to heighten personal responsibility toward creating social change; and, e) discovery of new knowledge.

Currently, many options exist including voice, video, data, and print medias for the gathering and facilitating of the adult learning process. “These types of programs can provide adults with a second chance at a college education, reach those disadvantaged by limited time, distance or physical disability, and update the knowledge base of workers at their places of employment” (Willis, guide 1, 2002).

### **Specific Suggested Socio-Technical Modifications:**

- Increased motivators and requirements for student-to-student interaction.
- Timely teacher to student feedback; particularly that which is of the Socratic fashion of question asking and thought provoking reflections.
- Use of voice instructional audio tools such as telephone conferencing, audio-conferencing, short-wave radio and audiotape lessons or materials.
- Use of instructional video tools such as slides, videos, films, and video-conferencing.
- Optimal implementation of electronic mail, fax, real-time computer conferencing and World-Wide Web applications.
- Greater incorporation of most recent topic related print materials, including study guides, journal articles, textbooks, popular books, case studies and workbooks.
- Focus on objectively achieving identified outcomes of the course.
- Incorporation of interactive audio or video conferencing to cost-effectively incorporate guest speakers and content experts into course curriculum.

### **Expected Stakeholder Reaction to Change**

**Primary stakeholders include** students, student employers, student family members, university faculty, university support staff, and university administration. The possibility exists that all stakeholders will experience an increased level of initial stress due in part to the increased expectations of unilateral application of all suggestions. This stress is further increased by the speed in which change occurs. Unlike the metamorphosis of the butterfly, change no longer evolves over long periods of time. Now, with organizational change such as that evident in academic course re-structuring, it often feels like being part of an accelerated metamorphic process with insufficient time to adjust from one stage to the next. Once upon a time, only buildings were stressed and people could be tired, worried, anxious, nervous, uncertain, or working long hours. In more recent times, 'stress' has evolved from an engineering term to a culture construct (Columbia University, 1998). During major organizational change, the most important and difficult journey individuals need to make is the internal process of change (Bridges, 1995). While many of the external aspects of change happen according to schedule, the internal transition from denial and resistance to acceptance and commitment is a different story. Changing structures and developing new processes and procedures challenges stakeholders' beliefs as to their own identity and values. Individuals may experience feelings of disorientation, insecurity and uncertainty. Stakeholders may display a variety of emotional reactions regarding restructuring decisions and behaviors that, in stakeholder perception, have

robbed them of a known way of life and imagined security, and cast uncertain shadows on their future academic activities.

Based on the assumption that emotional and behavioral reactions are largely caused by conscious and unconscious beliefs, in addition to systemic relationships, the goal is to help stakeholders begin to understand the links between their own ways of thinking in response to change and their increased stress levels. Action planning and practice are crucial elements because beliefs and ways of thinking are the product of long-term learning and will not change without sustained hard work, in addition to the ingredients necessary for effective change processes. In changing, people are giving up part of themselves and letting go of ideas and practices they have long used to make sense of the world and of themselves. When practicing new behaviors, people experience feelings of insecurity and uncertainty. This anxiety along with other adverse affects of change can be reduced or eliminated by ensuring that all of the key ingredients of successful change are included in any plan and process for change. Effective change is made possible through provision of vision + skills + incentives + resources + action planning.

### Key Ingredients to Managing Complex Change:

Vision	+	Skills	+	Incentives	+	Resources	+	Action Plan	=	CHANGE
<input type="text"/>	+	Skills	+	Incentives	+	Resources	+	Action Plan	=	CONFUSION
Vision	+	<input type="text"/>	+	Incentives	+	Resources	+	Action Plan	=	ANXIETY
Vision	+	Skills	+	<input type="text"/>	+	Resources	+	Action Plan	=	RESISTANCE
Vision	+	Skills	+	Incentives	+	<input type="text"/>	+	Action Plan	=	FRUSTRATION
Vision	+	Skills	+	Incentives	+	Resources	+	<input type="text"/>	=	TREADMILL

From the stakeholder perspective, developing attitudes for successful self-management through the change process means learning to screen the input from situations, events and other people and process it appropriately. Provided with the ingredients for a successful change process, stakeholders can learn to sort, toss, keep or redirect incoming information by learning to be alert to their own emotional responses and inner dialogue.

### Conditions Necessary for Successful Introduction

In most organizations, events happen that stakeholders disagree with, yet remain out of their control to stop or change. Some form of organizational change will always be present, resulting in increased workload, deadlines, conflicts, uncertainty and frustration. In developing the program our goal was not to eliminate stress (there is no magical 'cure'), but to offer tools to manage it and methods to help minimize its effects. The goal of leadership is to help stakeholders begin to understand the links between their own ways of thinking in response to change and their increased stress levels. Within organizational change, people will experience things they cannot control. At times, stakeholders are forced to make some difficult or painful changes where desirable choices seem non-existent. Unfortunately, people may direct their attention to the things they cannot control, resulting in reduced awareness of available choices and feelings of being trapped. This results in higher stress levels and decreased effectiveness. Working with stakeholders to identify what they can and cannot control about the changes they will be

experiencing leads to realizations like the following:

<b>What we cannot control:</b>	<b>What we can control:</b>
Decisions made by administration	How we behave or act
Some decisions made by top management	Our thoughts
Other people	Our contribution and performance
Consequences of our behavior or actions	Our choices
The unknowing self	What we say to others, positive or negative input

*“Successful distance education programs rely on the consistent and integrated efforts of students, faculty, facilitators, support staff, and administrators. Without exception, effective distance education programs begin with careful planning and a focused understanding of course requirements and student needs”*  
(Willis, guide 1, 2002).

While administrators of educational institutions often focus on the technical requirements of early implementation activities with distance learning strategies, later administrative emphasis is more appropriately focused on coalition and consensus building. Necessary for successful introduction of any change is visionary leadership, which can bring together the forces and resources necessary for successful implementation. In particular, administrative leadership and faculty will need to have in place trained and efficient support staff with the necessary resources to facilitate distribution and access to all course materials and technology for easy student access and use.

### **Faculty Strategies for an Improved Transition Process:**

- Develop an understanding of the characteristics and needs of distant learning students with little first-hand experience and limited, if any, face-to-face contact.
- Adapt teaching styles taking into consideration the needs and expectations of multiple, often diverse, audiences.
- Develop a working understanding of delivery technology, while remaining focused on the teaching role.
- Function effectively as a skilled facilitator as well as content provider (Willis, guide 1, 2002).

### **Improved Planning and Organization for Successful Implementation:**

Before developing something new, check and review existing materials for content and presentation ideas (Willis, guide 2, 2002)

Hands-on training with the technology of delivery is critical for both teacher and students. Consider a pre-class session in which the class meets informally using the delivery technology and learns about the roles and responsibilities of technical support staff (Willis, guide 2, 2002).

At the start of class, initiate a frank discussion to set rules, guidelines, and standards. Once procedures have been established, consistently uphold them (Willis, guide 2, 2002).

By its very nature, distance education relies heavily on the individual students' ability to manage and control their personal and situational circumstances to be successful.

Academic achievement correlates with more positive internal beliefs (Findley & Cooper, 1983; Phares, 1976; Riipinen, 1994). These include: competitiveness, motivation to learn for its own sake rather than for performance, and motivation to avoid failure (Eppler & Harju, 1997; Platow & Shave, 1995; Thorne, 1995).

In reflection, additional keys to success include:

- a) the ability to balance student studies with other personal and work commitments;
- b) comprehensive orientation to expectations and learning objectives;
- c) universal and user-friendly technology support;
- d) a positive attitude about overcoming obstacles and challenges;
- e) record achievements, learnings and useful resources; and,
- f) get appropriate training to master basic academic skills, such as library and writing skills is especially helpful.

For the adult learner, the principles of online learning are compatible with the strategies of adult learning that include: self-directed learning, using past experience as a resource base for learning, fitting new knowledge into current work and personal life situations, real-life problems-solving advantages, and time-management advantages for the time conscious student.

For teachers, facilitating a distance-learning program is a very different skill from lecturing or other forms of instruction in which the teacher dominates. Teachers need to be able to assess students' readiness for such learning and guide them from a position of dependence to independence. Teachers should provide a structure, in terms of offering guidance, checking plans, suggesting resources, and clarifying the basis on which work will be judged. Teachers have all heard the call "Back to Basics!" Effective strategies include:

- a) creating an awareness of the strategy to be learned,
- b) modeling the strategy,
- c) providing practice in the use of the strategy, and,
- d) applying the strategy in real-life situations.

The most in-depth and perhaps most important goal of teaching is to enhance comprehension, learning is more meaningful when students are active participants. We all remember best that in which we take an active part. Higher-level critical thinking skills are an important part of comprehension. Asking questions that cause students to use inductive thinking is important. Another strategy is to provide activities that are open ended and allow students the opportunity to come up with a variety of answers. In addition, having to explain how they arrived at their choice and discerning whether or not

they have used logical thinking is also important to student development.

## Conclusion

For the student eager to engage in the advantages and stimulation of an active adult learning environment distance learning education programs are highly advantageous. Few learning opportunities can provide the combination of enriched collaborative learning environments offered by a quality on-line environment with the freedom and flexibility advantages necessary for the success and inclusion of active professionals. In addition, the collegial support of cohort learning partners and professors with professional experience greatly enrich the environment, the learning challenge, and the learning outcomes.

Checkland defines systems thinking as: "an epistemology which, when applied to human activity is based upon the four basic ideas: emergence, hierarchy, communication, and control as characteristics of systems. When applied to natural or designed systems the crucial characteristic is the emergent properties of the whole" (Checkland, 1999, p. 318). Systems theory emphasizes the capacity to realize the relationships, structures and patterns of the whole, versus segmentation and analysis of separate parts (Checkland, 1999; Senge, 1990). Understanding systems theory allows for the witnessing of system-based relationships contributing to cause and effect reactions versus the alternative of focusing on the outcome symptoms. "Research comparing distance education to traditional face-to-face instruction indicates that teaching and studying at a distance can be as effective as traditional instruction, when the method and technologies used are appropriate to the instructional tasks, there is student-to-student interaction, and when there is timely teacher-to-student feedback (Moore & Thompson, 1990; Verduin & Clark, 1991)" (Willis, guide 1, 2002).

## References

- Atwong, C T, Lang, I. L., Doak, L., & Aijo, T. S. (1996). How collaborative learning spans the globe, *Marketing News*, 30 Aug.
- Bersch, C. (2001, April). Can you go the distance? *Communication News*, 38(4), pp. 32-36.
- Bridges, W. *Managing Transitions*. Nicholas Brealey Publishers, London, 1995.
- Burns, R. *Managing People In Changing Times*. Allen & Unwin, Sydney, 1993.
- Checkland, P. (1999). *Systems thinking, systems practice*. Chichester, NY: John Wiley & Sons, LTD.
- Columbia University Graduate School of Journalism. *The Commerce of Coping*. (internet website: <http://stress.jrn.columbia.edu/site/index.html>), 1998.
- Cordell, V (1996), Application of group decision support systems in marketing education, *Journal of Marketing Education*, 18, Spring.

- Eppler, M. & Harju, B. (1997). Achievement motivation goals in relation to academic performance in traditional and nontraditional college students, *Research in Higher Education*, vol. 38 no. 5, pp. 557-73.
- Findley, M. I & Cooper, H. M. (1983). Locus of control and academic achievement: A literature review, *Journal of Personality and Social Psychology*, No. 64, pp. 419-27.
- Hatch, M. (1997). *Organization theory* (1st ed.). Oxford: Oxford University Press.
- Moore, M. G. & Thompson, M. M., with Quigley, A. B., Clark, G. C., & Goff, G. G. (1990). The effects of distance learning: A summary of the literature. *Research Monograph No. 2*. University Park, PA: The Pennsylvania State University, American Center for the Study of Distance Education. (ED 330 321)
- Natesan, M. & Natesan, N. C. (1996). The Internet marketing tool in the classroom, in *Great ideas for teaching marketing*, Hair, J. F., Lamb Jr., C. W., McDaniel, C., & Roach, S. S., (eds.) Cincinnati, OH: Southwestern College Publishing.
- Phares, M. (1976) *Locus of control in personality*. Morristown, NJ: General Learning Press.
- Platow, M. & Shave, R. 1995, Social value orientations and the expression of achievement motivation, *Journal of Social Psychology*, 135(1) pp. 71-81.
- Riipinen, M. (1994). Extrinsic occupational needs and the relationship between need for achievement and locus of control, *Journal of Psychology Interdisciplinary & Applied*, 128(5) pp. 577-87
- Seibert, L. J. (1996). Using the net, e-mail in marketing education, *Marketing News*, 30, August.
- Siegel, C. F. (1996). Using computer networks (intranet and internet) to enhance your students marketing skills, *Journal of marketing education*, 18, Fall.
- Thorne, Y. (1995). Achievement motivation in high achieving Latina women, *Roeper Review*, 18(1), pp. 44-9.
- Verduin, J. R. & Clark, T. A. (1991). *Distance education: The foundations of effective practice*. San Francisco, CA: Jossey-Bass Publishers.
- von Bertalanffy, L. (1968). *General system theory: Foundations, development, applications*. New York: George Braziller.
- Wee Keng Neo, Lynda & Eng, Chen Swee. (2001). Getting it right: Enhancing On-line learning for higher education using the learner-driven approach. *Singapore Management Review*. 2001 2<sup>nd</sup> half, 23(2), p61, 14p
- Willis, B. (2002). *Distance education at a glance*. University of Idaho. Internet resource retrieved: October 15, 2002.

## About the Authors

**Denise Land** is Deputy Director of the Child Abuse Prevention Council of Placer County. She is responsible for fund development, finance administration, multi-agency collaboration and integration strategies, fee reimbursement strategies, and family support program technical assistance. Ms. Land has had experience working with diverse communities, particularly in the areas of child development and child abuse prevention and intervention. She holds an MSW and a BS in Gerontology. She is currently a Doctor of Management student at the University of Phoenix.

**Anthony Chiedu Nwadei** is a doctoral candidate of the University of Phoenix Doctor of Management, Organizational Leadership online program. He holds a B.Sc. (Hons.) and M.Sc. degrees in Mechanical Engineering and MBA.

**Scott Dwain Stufflebeam** is a consultant and an attorney focusing upon organizations, human resources, and real estate. He was president of First American Title Company with over twenty years of experience in management. He is currently enrolled in the doctorate program at University of Phoenix.

**Cyril Olaka** is a business consultant in Dallas, Texas. He attended Minnesota State University, Mankato, Minnesota, where he obtained Master of Business Administration (MBA) degree in March 1985. He also obtained Bachelor of Science degree in February 1993 and Bachelor of Arts degree in Economics in March 1995 from Bemidji State University, Bemidji, Minnesota. He is currently pursuing Doctor of Management in Organizational Leadership in University of Phoenix.



**Editor's Note:** Dr. Juwah presents powerful documentation on effective implementation of major tenets of constructivism within the Distance Learning arena. It would be an interesting challenge for our readers involved in distance learning practice to implement and evaluate this approach.

# Using Peer Assessment to Develop Skills and Capabilities

Charles Juwah

## Abstract

This paper presents the use of a seven-stage peer assessment process and peer learning in an online context to develop desired skills and capabilities. The contextualized and authentic assessments included case studies, projects, critique and portfolio of evidence. This approach helped ensure effectiveness and sustainability of the assessment method and practice in meeting intended learning outcomes. The ideas discussed in this paper are based on evidence drawn from research and practice in facilitating the development of online tutoring skills.

## Introduction

Assessment must perform double duty; not only does it assess content it must also prepare learners for future learning (*Boud, 2002 – research seminar presentation*).

For assessment to be effective, it should perform the following functions:

- act as a motivator for learning (Boud et al, 1999; Cowan, 1998);
- promote deep learning – in which the learner engages with (a) the learning materials and resources, (b) other learners and (c) tutor/facilitator (Marton & Saljo, 1984);
- contribute to the development of skills (Boud et al, 1999; 2002; Gibbs;1992; Ramsden, 1992);
- be cost effective and sustainable (Boud, 2002).

In higher education, most of the assessment is based on traditional assessment practices of essay and problem type examination. These traditional assessment practices, it has been found cannot adequately test for critical thinking, creativity, reflection etc. (Lewis and Johnson, 2002, p. 7). However, alternative and diverse assessment methods, for example, peer assessment, portfolio, reflective journaling, etc. have been shown to be constructive, provide authentic and contextualized assessment that promotes deep learning and skills development (*Boud et al, 1999; Cowan, 1998, Gipps, 1999; Race, 1998*).

Peer assessment is an interactive and dynamic process that involves learners in assessing, critiquing and making value judgment on the quality and standard of work of other learners, and providing feedback to peers to enable them enhance performance. Topping (1998) in his paper on peer assessment between students in colleges and universities

provides a detailed typology of peer assessment methods. Evidence from research findings abound supporting the benefits of peer assessment to learners. These include peer learning in a non-threatening environment, the removal of power domination by the teacher over the student, the involvement of the student in the assessment process (Topping, 1998). However, as learners are central in this assessment process, concerns are of raised about their expertise in the knowledge content of the subject matter and their assessment skills to ensure reliability, validity and fairness.

This paper discusses some of the issues of peer assessment and reports on the alignment of teaching and assessment method (peer assessment) in an online learning environment to foster the development of a range of desired skills set and capabilities - critical thinking, ability to analyze and synthesize information, problem solve, assessing and giving feedback, make value judgment and reflection. In addition, it details how this method of assessment can be employed to meet the requirements of reliability, validity and fairness of formal assessment but more importantly reduce assessment load for both the learners and tutor/facilitator.

## **Need for the Alignment of Assessment**

Cowan (1999b, RGU Year of Assessment Workshop) states, “*assessment is the powerhouse of learning. It is the engine that drives learning*”. However, in many online courses, assessment is based on quizzes, multiple choice questions and/or essays. These assessment methods are very limited in effectively testing and developing higher order skills, for example, critical thinking, creativity and reflection. Therefore, to provide effective and meaningful learning, it is imperative that curriculum/courses are constructively aligned to meet the intended learning outcomes of developing the learners’ knowledge, skills and desired capabilities.

Biggs (1999) defines **constructive alignment** as

*A good teaching system aligns teaching method and assessment to the learning activities stated in the objectives, so that all aspects of this system are in accord in supporting appropriate student learning. This system of constructive alignment is based on the twin principles of constructivism in learning and alignment in teaching. (p 11).*

In focusing on assessment in a system of constructive alignment, assessment must be integral in the design of the curriculum for it to contribute towards meeting the intended learning outcomes. Thus, assessment must not be a ‘tag on’ to the curriculum or become a burden or obstacle in the learning process.

Drawing on the twin principles of constructivism in learning and alignment in teaching (Biggs, 1999) and Boud’s sustainable assessment models as frames of reference, an attempt was made to connect teaching and assessment methods and practice in an Online Tutoring (e-Tutoring) Skills course at the Centre for the Enhancement of Learning and Teaching (CELT), The Robert Gordon University, Aberdeen, UK. The Online Tutoring course was designed primarily for developing faculty to enable them to effectively teach and support students’ learning online. The course is fifteen-weeks in duration and can be delivered entirely online via the FirstClass® learning environment or via a blended

learning approach (a mix of face-to-face and online delivery). The course has as its outcomes:

- To familiarise themselves with the use of online learning environments in teaching, learning and assessment;
- To appraise the pedagogy underpinning online teaching and learning;
- To design fit-for-purpose online activities and/or course(s);
- To embed ICT in the curriculum and to use innovative technology in teaching and supporting learning;
- To develop effective facilitator roles of moderating, reviewing, summarising, assessing and giving feedback on individual and group performance, and
- To reflect on own personal and professional practice and development.

Developing the complex range of knowledge, skills and capabilities that faculty required for facilitating online education needed a well thought through learning and assessment strategies. The constructivist and collaborative nature of online education necessitated an aligned teaching/learning and assessment methods. Based on research evidence and informed knowledge, peer learning and peer assessment methods were adopted.

### **Rationale for Peer Assessment**

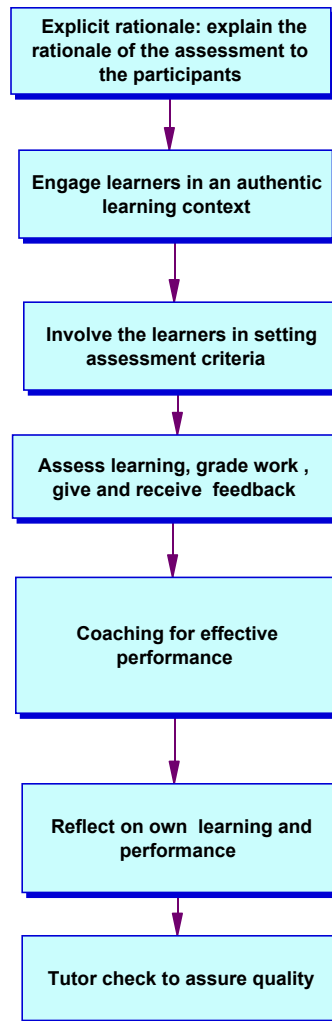
In constructivist education, learners construct knowledge and make meaning through social dialogue and interaction with the environment (Vygostky, 1978). This form of collaborative and cooperative learning, Dolittle & Camp (1999) posit, is underpinned by a set of theoretical principles. These are:

- Learning should take place in authentic and real-world environments;
- Learning should involve social negotiation and mediation;
- Content and skills should be made relevant to the learner;
- Content and skills should be understood within the framework of the learner's prior knowledge;
- Students should be assessed formatively, serving to inform future learning experiences;
- Students should be encouraged to become self-regulatory, self-mediated, and self-aware;
- Teachers serve primarily as guides and facilitators of learning, not instructors;
- Teachers should provide for and encourage multiple perspectives and representations of content (paragraph 29).

In line with Dolittle & Camp's theoretical principles and taking into account the nature of the online tutoring course characterized by 1) asynchronous collaborative learning, and 2) negotiation and construction of meaning through discourse (talk) in the form of postings to the discussion forum, peer learning and peer assessment were the most appropriate learning and assessment methods. In this context, the tutor/facilitator acts more as a guide on the side (Race, 1998; Topping, 1998).

## The Peer Assessment Process

The adoption of peer assessment in assess learning in the online tutoring course necessitated the development of a framework to ensure that the assessment method is constructively aligned to teaching and learning methods. The framework developed for the peer assessment involved a **seven**-stage process (see figure 1).



**Figure 1. Peer Assessment: The seven-stage process**

### 1. Explicit rationale.

The participants were provided with detailed appropriate information in the course handbook on the rationale of the assessment method. In addition, participants were also provided with a Guide on Peer Assessment containing exemplars on how to devise assessment criteria, develop an assessment grid/rubric and a brief on how to give and receive feedback after assessment.

## 2. Engage learners in an authentic learning context

In developing the desired skills and capabilities of facilitating, moderating, reviewing, summarizing, assessing and giving feedback on individual and group performance, as well as reflecting one's own personal and professional practice and development, the course was designed and delivered in a way that the learning activities and assessment tasks involved each participant in taking turns to fulfill each of the above listed roles (see Table 1). This ensured that learning was authentic and contextualized, as well as provided the opportunity for the participants to learn by doing.

**Table 1. Knowledge, Skills and Capabilities Development in Online Tutoring Course**

Skills	
Cognitive	Knowledge of online education; Comprehension of the pedagogy of online education; Application – link theory to practice; Analysis and interpretation of facts and situations; Synthesise new knowledge from available information and evidence; Evaluation of learning and situations.
Transferable	Assessing learning, grading work, giving and receiving feedback Communication – communicate effectively in different situations and audiences using appropriate techniques, media and technology; Team-working.
Competencies/ Capabilities	Decision making and judgement;
Attributes	Trustworthy and honest; Reliable;
Values	Ethics; Accountability – take account of own actions; Fairness – fair in all dealings with others; Respect and value the opinion and belief of others.
Personal Development	Self aware; Self esteem and confident; Reflects on own practice and continually identifying new learning needs for own growth and development.

## 3. Involve students in setting assessment criteria

As part of their learning and acquiring the desired tutoring/facilitating repertoires, participants through tasks were involved in devising assessment criteria and developing assessment rubric based on a staged learning process. This staged learning involved learning by examples. Participants were given a step-by-step guide to peer assessment including devising criteria, allocating weightings for grades/marks (Baume, 2001b). Next, the participants were involved in devising relevant assessment criteria to a given task/activity and/or completing partially supplied assessment rubrics (see exemplar below)

Lastly, participants were asked to devise and design from scratch assessment criteria and rubric for given tasks.

## Example: Devising Assessment Criteria

“Isolation and lack of motivation have been identified as main causes for the high drop out rates in online courses”. Reflecting on a course you teach/facilitate, what in your view would cause a student to be isolated (feel isolated) and de-motivated as to drop out of a course? What impact do you think motivation, or the lack of it, has on a learning community? Using experience gained from your own course, suggest possible solutions to the situations you have identified. You may wish to link your response to research/evidence-based information or use the information to support your submission. Post your individual response titled Isolation and lack of motivation by the deadline of 12/11/2002 to The Vineyard Garden conference area. Read the posts put up by the other course members, respond to the posts, question and comment on issues that may be the same as or are different from yours.

Each group is to devise **four criteria** by which the posts are to be assessed and graded. Following which, both groups should agree a common and final set of four criteria. The posts will be graded as **Met the criteria** or **Criteria not met**. (Refer to the Guidelines for Peer Assessment in the **Resources Section** to help you with devising assessment criteria).

### Task

Allocate roles for the group task as appropriate by 5/11/2002.

Each individual to put up own post by 12/11/2001.

Named individual to summarise, finalise and agree group’s response and this should be posted to The Vineyard Garden conference area by 19/11/2002.

## 4. Assess learning and give feedback

Participants were required to be involved in formative and summative assessment of learning and giving feedback to peers on their performance and development through set activities.

## 5. Coach for effective performance.

Participants were coached to promote the development and acquisition of desired skills and capabilities, as well as to ensure best practice. Coaching involves demonstrating/modeling by example, prompting, questioning, supporting and providing re-assurance and encouragement (Murphy, 2001).

## 6. Reflect on learning

Participants were encouraged to reflect on their learning, performance and practice. These were done via dialogue with peers and tutor/facilitator, responses to online tutorial questions and reflective journaling. Frameworks for reflection and/or trigger questions were provided as guides to help participants reflect effectively.

## 7. Tutor check to assure quality

Tutor checked and monitored the assessment process to verify that the stated criteria for the course were fully met and to assure quality and standard of learning.

### Method

This study was carried out using an action research approach and relied on a variety of sources of data. This included participants' contributions to online discussions, coursework, assessment tasks, portfolio of evidence (Baume, 2001a; Cowan, 1999b) and course evaluation questionnaire.

### Discussion

Learning and assessment in the online tutoring course was based on critique of others' work, dialogic iterations, analysis, synthesis and construction of new knowledge and making of meaning. This hermeneutic approach to learning underpinned and enhanced participants' development of content knowledge and pedagogy of online teaching and assessment. The dialogic iterations and reiterations were crucial in enabling the participants to engage in deep learning (Marton & Saljo, 1984) and to acquire the language of discourse of online learning, thus enhancing participants' confidence to effectively perform in the online environment. The open discourse as one participant stated:

*...I believe that moving to online learning and facilitating not only engenders learner empowerment, but also engenders teacher empowerment! I think it engenders teacher empowerment because as a teacher I feel greater ownership of the course as a result of the 'issue' identification, reflection, implementation, and evaluation process. At the same time, I think it engenders learner empowerment because you tend to incorporate the same action learning process into the course design for your students' learning with tasks that ask them to make choices, implement them and then reflect on, and learn from, the perceived outcomes of those choices.*

Action learning (learning by doing) was critical in developing the various skills and repertoires required for facilitating and supporting learning online. Turn taking in performing the various roles of facilitator, summarizer and peer assessor ensured that participants were not only aware of but also achieved competency through performance and practice in an authentic and contextualized learning (Dolittle & Camp, 1999; Vygostky, 1978).

The training of participants in devising assessment criteria, developing assessment rubric/grade criteria as well as their involvement in assessing peers' work contributed in developing participants' ability to assess work, make value judgment, give and receive feedback. Evidence from the participants' coursework showed the following:

- that staged training in peer assessment and the interactive nature of the assessment, elicited improved quality and standard of participants' performance as facilitator, summariser and assessor;

- the dynamic and balanced assessment process equally ensured that through giving and receiving feedback participants were made aware of aspects of their knowledge and skills needing further development (Cowan, 1998; Marton & Saljo, 1976; Race, 1998).

From this study, which is still ongoing, it was quite apparent that clear guidelines and specific instructions in undertaking peer assessment were essential tools that must be provided for the learners. As we experienced, where instructions were unclear, learners were unsure what was required of them and felt disempowered and frustrated.

Coaching through modeling, prompting, questioning and encouragement provided the relevant scaffolding that enabled the participants to develop and achieve competency. This structured learning through interaction with and guidance of the tutor/facilitator and peers enhances the learners' development through the zone of proximal development to actual development (Vygotsky, 1978).

The participants' development through the zone of proximal development was very evident in the improvement of assessing and feedback giving skills from the start through to the latter stages of the course. The quality of feedback was much more focused, constructive and given with some degree of confidence at the latter stages of the course compared to the limited feedback, often un-critical and un-focused given at the start of the course.

Experience from the pilot course necessitated the introduction of a justification box as part of the assessment performance. The justification box was added to help limit or eliminate bias in assessment, for example, to prevent favoritism amongst participants. It requires the participants to justify with reasons their grading of the assessed candidate's performance. (See Table 2 - Assessment Proforma).

**Table 2. Assessment Proforma**

Name of course participant: \_\_\_\_\_

Topic: \_\_\_\_\_ Date: \_\_\_\_\_

	<b>Met Criteria</b>	<b>Criteria Not Met</b>	<b>Remark</b>
<b>Criteria 1</b> Course participants to devise assessment criteria in relation to given task			
<b>Criteria 2</b> Course participants to devise assessment criteria in relation to given task			
<b>Criteria 3</b> Course participants to devise assessment criteria in relation to given task			

<p><b>Argument/Discourse</b>          Develops an effective, coherent and lucid argument to support and/or substantiate the hypothesis and/or topic being discussed;          Argument is based on correct analysis, interpretation of the situation (and/or application) of data or results and synthesis and logical sequencing of information/facts to construct new knowledge/meaning.</p>			
<p><b>Critical thinking</b>          Uses available theories and evidence to formulate logical reasoning and argument to create new knowledge,          Uses available theories, concepts and evidence to validate and appropriate new knowledge to practice;          Applies new knowledge in appropriate situations to:          - solve problems, improve and enhance performance and practice, and contribute to scholarship.</p>			
<p><b>Contributes to the effectiveness of the group.</b>          constructively engages with peers - initiates, directs and leads, supports and values the effort of others, provides appropriate suggestions and feedback to enable them develop and to achieve their goals and potential;          handles and copes effectively with unusual/awkward situations and enables others to work harmoniously.</p>			
<p><b>Reflects on own learning</b>          Clarifies goals, manages and evaluates own learning and identifies new learning needs;          Uses feedback given to improve own performance and practice.</p>			
<p><b>Feedback on candidate's performance</b></p>			
<p><b>Overall Grade for assessment</b></p>	<p>Achieved</p>	<p>Not Achieved</p>	
<p><b>Justification</b>          Please justify with reasons the overall grade allocated to the candidate.</p> <p>Name of Peer Assessor: _____ -          Date: _____</p>			

Peer assessment and peer learning enabled the participants to model cognitive behaviors, thus, contributing to learners gaining mastery of knowledge. In addition, meta-cognitive discussions enhance participants' awareness of alternative perspectives on issues, as well

as promote self-assessment and reflection (Cowan, 1999a; Moon 1999). An entry in the learning journal of one course participant read:

*My feelings towards the learning portfolio were generally positive; it pushed me to think about what I had learnt and I valued the opportunity to reflect. It's useful to keep recording what we have learnt so that we can evaluate our learning at the end of the course.*

*This course has clarified some of the potential pitfalls and made me think about what might work in an online environment and how it might be designed to maximise the opportunities the new technologies create. The design of any online materials has to be carefully considered to match the pedagogical needs of the students to allow them to fulfil their potential. Personalities and the needs of the individual must be taken into consideration as much as they would in a traditional teaching environment.*

An emergent outcome from the study was the reduction in tutor/facilitator assessment load. The reduction in time spent by the facilitator in commenting on individual posts as well as assessing individual work meant that this assessment approach was cost effective and sustainable (Boud, 2002). The adoption of this approach to peer assessment for very large groups of course participants has huge economical benefits for training providers.

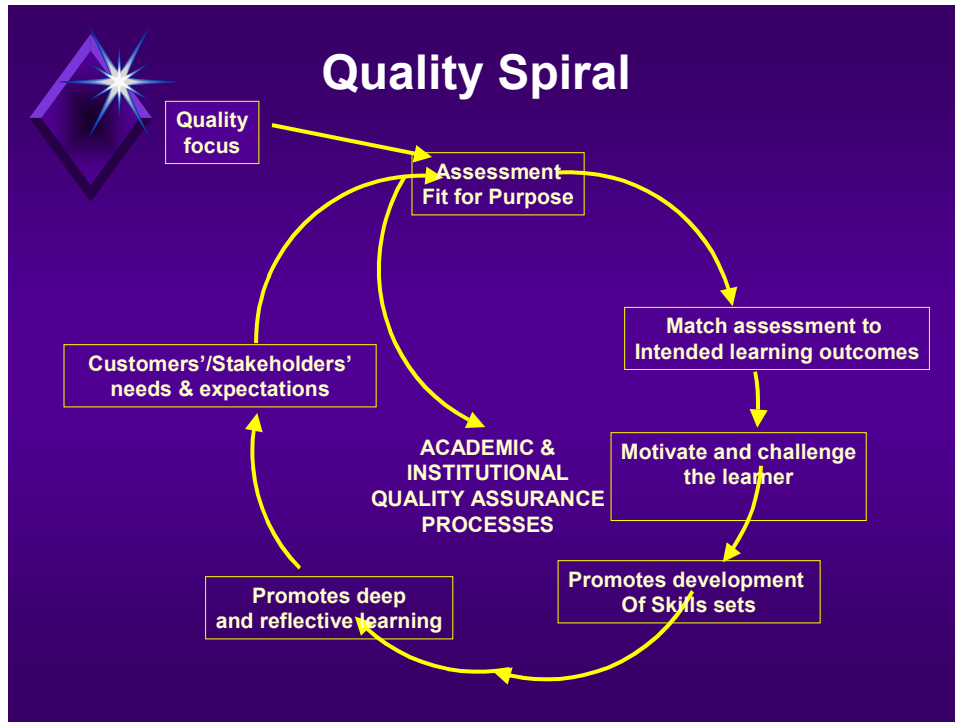
## **Conclusion**

Evidence from this study showed that peer assessment and peer learning were very effective and efficient in ensuring the development of the desired knowledge, skills and capabilities that faculty required for facilitating and supporting online learning.

In addition, peer assessment was contributory in promoting self-assessment and self-regulation in participants with the consequent effect of the enhancement of quality and standard of practice and performance.

For peer assessment to be effective, rigorous and appropriate training must be provided to enable the participants familiarize themselves with the process of devising assessment criteria, developing an assessment rubric, assessing work and giving and receiving feedback. In addition, participants require encouragement and support from the tutor/facilitator to help build their confidence in engaging with and using the assessment method to its maximum potential.

Assessment methods used in assessing learning must be fit-for-purpose in meeting the learner's needs, and in addition, the implementation of the assessment should comply with good assessment practice (AAHE, 1996). In keeping with these two tenets, a Quality Spiral (see Figure 2) was used to enhance as well as assure both the quality of learning and the assessment processes.



Source: Juwah (2000)

Figure 2. Quality Spiral for Assessment

## References

American Association for Higher Education. (1996). *Nine principles of good practice for assessing student learning* [Online]. Available: <http://www.aahe.org/assessment/principl.htm>

Baume, D. (2001a). *Assessment Series No.6. A Briefing on Assessment of Portfolios* [http://www.ltsn.ac.uk/genericcentre/projects/assessment/assess\\_series/06Portfolios.rtf](http://www.ltsn.ac.uk/genericcentre/projects/assessment/assess_series/06Portfolios.rtf)

Baume, D. (2001b). *Assessment Series No.7. A Briefing on Key Concepts Formative and summative, criterion & norm-referenced assessment* [http://www.ltsn.ac.uk/genericcentre/projects/assessment/assess\\_series/07KeyConcepts.rtf](http://www.ltsn.ac.uk/genericcentre/projects/assessment/assess_series/07KeyConcepts.rtf)

Biggs J (1999). *Teaching for Quality Learning at University*. Buckingham: Society for Research into Higher Education, RHE & Open University Press.

Boud, D., Cohen, R. & Sampson, J. (1999). *Peer Learning and Assessment*. *Assessment and Evaluation in Higher Education*, 24, (4), 413-426.

Boud, D. (2002). Seminar given on Assessment at the launch of the University of Glasgow's Centre for Research in Higher Education. 10 February 2002.

Cowan, J (1998). *On Becoming an Innovative University Teacher*. Buckingham: Society for Research into Higher Education, RHE & Open University Press.

Cowan, J. (1999a). In *A handbook of techniques for formative evaluation*. George, J. & Cowan, J. London: Kogan Page.

Cowan, J. (1999b). *Assessing Reflection*. Workshop presented at the Year of Assessment, The Robert Gordon University, Aberdeen.

Doolittle, P. E. & Camp, W. G. (1999). Constructivism: The Career and Technical Education Perspective. *Journal of Vocational and Technical Education* 16, (1), 23-46. Available: <http://scholar.lib.vt.edu/ejournals/JVTE/v16n1/doolittle.html>

Elton, L. & Johnston, B. (2002). *Assessment in Universities: A critical Review Assessment Research*. LTSN Generic Centre, York, UK. Available: [http://www.ltsn.ac.uk/application.asp?app=resources.asp&process=full\\_record&section=generic&id=13](http://www.ltsn.ac.uk/application.asp?app=resources.asp&process=full_record&section=generic&id=13)

Gibbs, G. (1992). *Improving the Quality of Student Learning*. Bristol: Technical Education Services.

Gipps, C. (1999). Socio-cultural perspective on assessment. In A. Iran-Nejad, & P. D. Pearson (Eds.), *Review of Research in Education*. Vol. 24, 355-392. Washington: American Educational Research Association.

Juwah, C. I. (2000). *The Quality Spiral for Assessment*. The Robert Gordon University (RGU) Year of Assessment.

Marton, F. & Saljo, R. (1976) *On Qualitative Differences in Learning –I: Outcome and Process*. British Journal of Educational Technology, 46, 4-11.

Marton, F. & Saljo, R. (1984) *Approaches to Learning*. In: The Experience of Learning. Marton, F., Hounsell, D. and Entwistle, N. (Eds). Edinburgh: Scottish Academic Press.

Moon, J. (1999). *Reflection in Learning and Professional Development*. London: Kogan Page.

Race, P. (1998). *Practical Pointers on Peer-Assessment* SEDA Paper 102, Birmingham: SEDA Publications.

Ramsden, P. (1992). *Learning to Teach in Higher Education*. London: Routledge.

Roger Murphy (2001) - Assessment Series No.5. A Briefing on Key Skills in Higher Education  
[http://www.ltsn.ac.uk/genericcentre/projects/assessment/assess\\_series/05KeySkills.rtf](http://www.ltsn.ac.uk/genericcentre/projects/assessment/assess_series/05KeySkills.rtf)

Topping, K. (1998). Peer assessment between students in colleges and universities. *Review of Educational Research*, 68, 249-276.

Vygotsky, L.S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

## About the Author

**Charles Juwah** PhD, MBA, ILTM is an educational developer and Deputy Head, Centre for the Enhancement of Learning and Teaching, The Robert Gordon University, Aberdeen, Scotland, UK. Dr Juwah is course leader for the new lecturers' accreditation programme. His research interests include online (e-) learning, assessment issues, postgraduate supervision and personal development planning.

He is a member of the UK Institute for Learning and Teaching in Higher Education. He may be contacted via email: [CharlesJuwah@aol.com](mailto:CharlesJuwah@aol.com)

**Editor's Note:** Successes in training and in education are worthy of considerable attention. Colleen Fuhs, Manager of Education Information Services for Northwest Airlines has developed 80% computer-based – 20% instructor based training that is producing significant results in meeting technology competency levels now necessary in academic areas as well as in industry.

## **Elevating Commitment to Learning to New Heights**

**Colleen Fuhs**

At the core of senior managers' learning initiative aptly named "Checklist for the Future" is an emphasis on empowering Northwest's people with knowledge and skills through quality professional development. The company's 55,000 employees have an advantage on the future, thanks to a wide array of resources --- a checkout library, a personal training plan, a successful book program, mentoring in combination with computer-based training, and a business skills library, where there are magazines, videos, audiotapes, books and periodicals.

"Today's learning environment is a startling contrast to four years ago, when only 10 percent of new training requests were being satisfied," said Colleen Fuhs, manager-education of Information Services at NWA. Her 13-person group is charged with overseeing training and the development of programs in line with the company's business objectives. "We are only as good as our employees, and we knew we needed to provide tools for a competitive edge, offer training based on skill gaps, and identify and link training to strategies."

Despite a training budget that has not increased in years, Fuhs's team has helped Northwest become a more efficient, effective learning organization. The company offers quality training to all 55,000 employees --- Information Services (IS) training that is now 80 percent computer-based training, or e-Learning, and 20 percent instructor-led training (ILT). With e-Learning, Northwest has decreased the number of students sent offsite, reduced work time lost, and increased training hours per employee.

Northwest's skills management system (SMS), in particular, has become an essential part of its enterprise learning environment. The company's self-built SMS has promoted communication between managers and employees, saved time, and helped Fuhs's team identify appropriate reference and training options.

Northwest maintains NETg's entire e-Learning library, as well as offerings from other providers. In total, Northwest can pull from 1,800 training options to develop the 3,300 skills that the organization deems important for employees in different roles. Mathematically, if one were to link training and skilling, there could be 6 million possible matches. In times of layoffs and new business objectives stemming from an increased emphasis on the non-business traveler, manually linking training to skills is no longer an option. Speed is a must for Fuhs and her team.

### **How Do You Help 55,000 People Become Fast Learners?**

Because hundreds of vendors may supply training to any single organization, the laborious process of searching through myriad catalogs for the right course was a culprit

of time consumption known all too well by Fuhs and team. Even with an internally developed search feature, it still left links to inappropriate resources or outdated providers. Old-fashioned "linking" left them wanting for a more reliable and accurate output of best possible matches. Linking involves not only establishing a valid association of each training intervention to skills, but also matching the competency level for each training intervention. Considering that this process was done manually in response to each training request and that Fuhs and team typically receive 75 requests in a single week, it is easy to see why some training recommendations might be incomplete or inaccurate.

NETg's Precision Skilling was a welcome addition to Northwest. It automates the matching and linking, and systematically evaluates training course options against specific job profiles and skill requirement needs. The offering was easily integrated into Northwest's SMS, and in one thorough sweep, it accurately and reliably identifies the best training to develop a skill. With Precision Skilling, identifying all training resources for a skill gap can be done in minutes --- compared with the days to weeks it used to take.

### **How It Works**

Precision Skilling's matching software does a comparison of training and skills metadata -- the descriptive information input into a company's SMS, and comes up with a table of matches with probability scores for each match of training intervention per skilling object. Precision Skilling searches Northwest's entire training database --- assigning weight and determining relevancy based on context, level and matching key words in the training intervention description. The match represents an association between the metadata for a skilling object and a training intervention. A 'valid' match is where there is a positive relationship between them. Precision Skilling then links results to Northwest's SMS. In only minutes, a recent request for training on the skill gap "Coaching in the Workplace" pinpointed 48 out of 1,800 training resources appropriate for the student.

Precision Skilling pulls broadly from *all* existing training interventions and enables a dynamic training program, keeping pace with the changing needs of a workforce responding to new market forces. Because Precision Skilling incorporates all types of learning into the solutions for filling skill gaps, Northwest's training is being selected from all possible matches --- not just e-Learning. Further, because an employee's role can change from day-to-day, Precision Skilling's update software reconciles the linkages by comparing the previous databases to the latest databases and conveying the impact of the changes to the Fuhs and her team.

"The payoff is a significantly shortened time commitment in providing our employees training that we can trust to be the smartest and most level-appropriate choice," said Fuhs.

Four years after beginning Northwest's transition to computer-based training Fuhs once again has caught the attention of Northwest's senior managers, who have asked Fuhs to introduce the IS education's strategy and Precision Skilling company-wide upon noticing a significantly faster accommodation of training requests.

## **Business Challenge**

In the wake of layoffs and a company-wide focus on a new type of customer, there were new skill gaps that had not existed before. Northwest Airline's pledge to offer enterprise-wide learning was given impetus by senior managers' "Checklist for the Future." But the company's success in transitioning to technology-based training and increasing the number and types of learning resources created a labor problem for the company's information services group who were being asked to fill a growing number of requests for new training.

## **NETg Solution**

NETg's Precision Skilling automates the labor-intensive task of manually matching and linking training interventions (courses, units, lessons, topics, on-the-job training, tests, career experiences) to job skill requirements (skills, tasks, knowledge, behaviors).

## **Result**

As a result of Precision Skilling, employees are getting more appropriate training in a faster fashion. The manual process of linking skills to training once took days to weeks, but now level-appropriate training interventions can be linked in less than an hour.

Other training managers have expressed interest in Fuhs's latest weapon, and Precision Skilling is being introduced throughout the company. In addition, managers note a renewed interest in learning from their employees who are enthusiastic about the faster response to their training needs.

*"We are only as good as our employees, and we knew we needed to provide tools for a competitive edge, offer training based on skill gaps, and identify and link training to strategies."*

*"There is heightened focus on knowledge throughout our company. Precision Skilling makes it possible to accurately and quickly map out the right training program for each of our 55,000 employees."*

*"The ability to offer a fast turnaround on training requests is an important part of advancing knowledge to keep our company running strong. But prompt attention to their employees' requests also makes our managers look good in the eyes of their staff, and it improves employee morale and productivity."*

## **About the Author**

Colleen Fuhs is Manager of Education Information Services for Northwest Airlines.



**Editor's Note:** Within the College arena there are three major areas for focus on attrition rates for students whether distance learning or not. These are 1) community colleges, 2) universities, and 3) academic continuing education programs. Dr. Parker has some interesting research on rates of completion and factors significant in student attrition.

## **Identifying Predictors of Academic Persistence in Distance Education**

**Angie Parker**

### **Introduction**

Distance education as an alternative to face-to-face instruction has witnessed steady growth since its beginning in the mid-1800's. This growth is evidenced by the fact that in 2002 nearly 78 percent of all adult students had received education in some distance format. This influx of adults taking distance education courses has occurred in part because of the proliferating demands of our technological society and in part because of the complexity of modern life. While society calls for lifelong learning, employment and family responsibilities call for adults to seek forms of education other than traditional, face-to-face instruction. Distance education affords adults the required formal education while allowing for flexible scheduling.

With the growth of distance-education has come the problem of exceedingly high attrition rates. Carr and Ledwith (2000) found rates to exceed 40 percent in some institutions. In an attempt to identify causes for non-completion, numerous studies have centered on application of a variety of traditionally-based theoretical models to the distance education setting. Diaz (2002) used a test of learning styles to determine the correlation between students who scored as independent, self-directed individuals and completion of online instruction. Diaz reported a statistically significant correlation between self-motivated and academic persistence.

There is a critical need for colleges to be able to predict with some accuracy the potential persistence of distance education students. With institutions of higher education generally receiving governmental support based on enrollment, the issue of attrition is particularly important. If rate of completion could be enhanced, through better placement and counseling of distance education students, subsequent fiscal budgets could become more predictable.

The current study sought to test the theory that locus of control, or the level of self-motivation, is significantly correlated with academic persistence. This study also examined potential changes in locus of control scores over a semester for students who complete an online course. While numerous variables such as financial aid (Parker, 1999) and experience levels of instructors (Carr, 2000) have been touted as predictors of attrition in distance education, locus of control has consistently shown promise. The problem facing academic administrators and instructors tasked with finding answers to

the current high levels of attrition in distance delivered courses is the limited number of studies utilizing this variable.

## Hypotheses

This study had two hypotheses:

1. *Locus of control, as measured by the Rotter's Locus of Control scale, is a significant predictor of academic persistence.*
2. *Locus of control scores increase, moved toward internality, over the course of a semester for students enrolled in web-based instruction.*

## Review of the Literature

Locus of control is a learned trait (Rotter, 1966). The actual patterns of reinforcement influence the development of either internal or external locus of control. A person who is consistently reinforced for personal accomplishments will be more likely to possess an internal locus of control than a person who receives reinforcement sporadically or inconsistently. Rotter found that people differ in the extent to which they attribute outcomes to internal versus external sources of control. The results of Rotter's (1966, 1976) studies consistently suggest that "Those with internal...[control]...show more overt striving for achievement than those with external control" (p.21). The findings of Altman and Arambasich (1992) at the University of Calgary constitute a similar argument. This team of researchers hypothesized that internality would be positively related to program completion. The 1992 study found a significant difference between internal and external groups in attrition with internals demonstrating a greater degree of persistence.

Further evidence of the relationship between dropout and locus of control comes from a study by Dille and Mezack (1991). This research team utilized the Rotters I-E Locus of Control scale with 151 students enrolled in a telecourse at a southwestern community college. The data indicated that the 43 non-completers had an external locus of control while the 108 successful students were more internally oriented.

The research has indicated that students leave traditional higher education for a myriad of reasons but research indicates online students face a greater challenge to complete. The mediation of technology and the often lack of personal interaction are serious considerations for instructors and students alike. Bailey (2002) believes colleges must move to the point where student-learning styles are matched with the delivery medium. Diaz (2002) believes that locus of control in addition to learning styles, should serve as a roadmap for potential online students. Diaz and Cartnal (1999) reiterate the fact that internally motivated students are often the same students who complete online instruction:

*It is not surprising that students who prefer independent, self-paced instruction would self-select into an online class. It may be that the distance education format appealed to students with independent learning styles, and that independent*

*learning preferences are well suited to the relative isolation of the distance learning environment (p.134).*

A recent study (Liu, Lavelle & Andris, 2002) found that locus of control evolved over the course of a semester with students scoring higher (becoming more internal) at the end of a semester of online instruction. Liu, Lavelle & Andris state, "Online instruction can improve students' sense of personal competence, self-responsibilities, and beliefs about their own learning" (2002). Online instruction requires students to develop a stronger sense of their own competence through self-directed assignments. Interaction, which is mediated by technology, also requires the student to become an independent thinker and thus transition their locus of control to a more internal capacity.

Research indicates the significance of locus of control as an indicator of persistence in web-based instruction. Additionally, it has been illustrated that self-motivation can be enhanced with well-designed online instruction which encourages the students to be self-directed learners. Knowles (1984, 1992) indicated a strong need for adult learners to be self-directed and to take responsibility for their own decisions. Web-based instruction lends itself to this belief, as students must be responsible for their own time management, skill building, and eventual academic success or failure.

## **Method**

This study was conducted at a community college in Arizona. Ninety-five students and four instructors participated. Two of the four instructors taught the same class in both traditional and online formats. During the first week of the semester, both online and traditional students received the Rotter's Locus of Control survey. Online students were given one week to complete the survey while face-to-face students were asked to complete it the first night of class. Both groups of students received 15 weeks of instruction. The surveys were hand-scored and data analyzed using SPSS 10.

## **Instruments**

Internal-external (I-E) locus of control is hypothesized to be a bipolar construct. The locus of control is internal if a person perceives events to be contingent upon his or her own behavior; the locus of control is external when events are perceived to be contingent upon luck, fate, the control of others, the environment or anything else not under the student's control (March & Richards, 1987). While a number of scales have been developed to study locus of control, Rotter's (1966) scale dominates the literature.

The locus of control survey was offered online and in paper format. All surveys were hand scored with 12 as the cut off score for internality and externality. Low scores of 10 or less indicated internal control. Higher scores of 14 or higher indicated an external preference. Scores ranged from 1 to 23.

## **Experimental Design**

This study involved a single group pretest-posttest design. The participants were given the Locus of Control survey the first week of class. The students were then given 15

weeks of online, using *Blackboard*, or traditional instruction. In the last week of the course, students were given the Locus of Control survey again as a posttest. Scores from the pre and post Locus of Control surveys were correlated to determine if any change had occurred during the semester. A correlation analysis used to determine the relationship between the locus of control and academic persistence.

## Results and Discussion

This study was designed to test two hypotheses for the purpose of determining the relationship between locus of control and academic persistence. Locus of control data was obtained using the Rotter's I-E Locus of Control scale. College records provided information on attrition in each of the four classes used in the sample.

Table 1 provides the sample size for both the online and the traditional classes used in this study. It should be noted that two of the instructors chosen for this research taught both a web-based and a traditional section of the same course. The other two instructors taught only online or only in a traditional, face-to-face format.

**Table 1.**  
**Number of Students by Delivery Method**

	Delivery Method	
	Online	Traditional
	N	N
<b>Pretest</b>	52	43
<b>Posttest</b>	45	41

Table 2 provides a descriptive review of the study. The mean scores for the online component illustrate the fact that the online sample became more internal, or self motivated, during the course than did the traditional students. The table also demonstrates that traditional students tend to be more external than those who select technology-mediated instruction. These two findings were collaborated by the work of Liu, Lavelle and Andris (2002). The results also evidence the fact that web-based instruction has the potential for moving students to greater levels of self-directed motivation.

**Table 2.**  
**Means and Standard Deviation for Interval Variables Pre and Posttest**

	Pretest		Posttest	
	X	SD	X	SD
<b>Online</b>	10.06	5.6	6.04	2.1
<b>Traditional</b>	17.02	4.75	16.23	1.3

Carr (2000) also found that incoming freshmen tended toward external motivation and yet wanted the convenience of online instruction. Drop out rates for this group reached nearly 32 percent.

**Table 3.**  
**Completion Rates by Delivery Method**

<b>Type of Instruction</b>	<b>Status</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Online</b>	Completers	45	86 %
	Non-completers	7	14 %
<b>Traditional</b>	Completers	41	95 %
	Non-completers	2	5 %

Table 3 provides data on the frequency and percentage of completers by delivery method. As is evidenced throughout the literature, the traditional sections had a significantly higher rate of completion than that of the web-based.

### **Correlations**

The second analysis involved a chi-square whereby the status of completion was coded as 1 (completed) or 2 (non-completer) and correlated with the locus of control scores. The purpose was to determine the strength of the relationship between these two variables. These results indicate a strong correlation between academic persistence and internality, or self-motivation, in web-based courses. While traditional students showed little change in motivational scores, the level of completion was nearly 95 percent. Locus of control had no significant value in predicting completion rates in the traditional classroom.

**Table 4.**  
**Correlation between Locus of Control and Status of Completion Delivery Method**

<b>Type of Instruction</b>	<b>Status</b>	<b>Frequency</b>
<b>Online</b>	Internal	83
	External	73
<b>Traditional</b>	Internal	21
	External	18

p=.05

## Hypotheses

1. *Locus of Control, as measured by the Rotter's Locus of Control scale, is a significant predictor of academic persistence.*

Through the use of a chi-square, this hypothesis was shown to be significant. Locus of control and academic persistence were shown to have a correlation of .83 ( $p=.05$ ). Students with internal locus of control, self-motivated, were more likely to complete the online course than students who scored as externally motivated.

2. *Locus of control scores increase, moved toward internality, over the course of a semester for students enrolled in web-based instruction.*

This hypothesis was also proven to be significant. Students who enroll in online courses tend to become more self-motivated than students who attend traditional courses. Change in locus of control scores by the students enrolled in the traditional sections of the courses was not significant.

## Conclusion

The results of this study have generated a number of implications for those individuals charged with reducing high attrition rates in distance education courses. Although the results have not provided evidence that can be generalized to all distance education courses, the results do indicate a correlation between locus of control and academic persistence.

The study also illustrates that students who are moderately internal tend to become more self-directed in web-based courses. The implication for web-course designers and instructors is to understand that instructional intervention can be a powerful tool for accelerating motivational change. This same result was found by Liu, Lavelle & Andris, (2002) who illustrated that students who had a tendency toward internality increased their skills as self-motivated students during an online course.

This research also indicated a need for a screening procedure to determine students' locus of control. Those who score as internal should be encouraged to register for non-traditional delivery. Students who score as external may be better suited to the traditional format of coursework.

Further research is needed in the area of locus of control and self-motivation. Several studies (Diaz, 2002; Carr, 2000; Parker, 1999) have used Rotter's Locus of Control scale to compare student characteristics between distance education and traditional samples. Results of these studies have again added to the knowledge base by providing further insight into attrition. Moore (1989) has cautioned future researchers, however, to stop comparison studies and to focus only on the distance education student. "Distance and traditional forms of education draw from different populations, and thus learner problems must remain separate in future studies" (p. 89). It is, therefore, important for future research to develop constructs from which distance education can be evaluated and from which predictions of dropout can be formulated.

## References

- Altman, H. & Arambasich, L. (1992). A study of locus of control with adult students. *Canadian Counselor, 16*(2), 97-101.
- Bailey, M. (2002). *A new perception on the construct of distance learning*. New York: Miller & Associates Publishing.
- Carr, R. & Ledwith, F. (2000). Helping disadvantaged students. *Teaching at a Distance, 18*, 77-85.
- Carr, S. (2000, February 11). As distance education comes of age, the challenge is keeping the students. *Chronicle of Higher Education*.
- Diaz, D. (2002). Online drop rates revisited. *Technology Source*, May/June 2002.
- Diaz, D. & Cartnal, R. (1999). Students' learning styles in two classes: Online distance learning and equivalent on-campus. *College Teaching, 47*(4), 130-135.
- Dille, B. & Mezack, M. (1991). Identifying predictors of high risk among community college telecourse students. *American Journal of Distance Education, 5*(1), 24-35.
- Knowles, M. (1984). *Androgogy in action*. San Francisco: Jossey-Bass.
- Knowles, M. (1992). *Androgogy: A study of the adult learner*. San Francisco: Jossey-Bass.
- Liu, Y., Lavelle, E. & Andris, J. (2002). Experimental effects of online instruction on locus of control. *USDLA Journal* [Online] 16(6). Available: [http://www.usdla.org/html/journal/JUN02\\_Issue/article02.html](http://www.usdla.org/html/journal/JUN02_Issue/article02.html)
- March, H. & Richards, G. (1987). The multidimensionality of the Rotter I-E Scale and its higher order structure: An application of confirmatory factor analysis. *Multivariate Behavioral Research, 22*, 39-69.
- Moore, M. (1989). Recruiting and retaining adult students in distance education. *New Directions for Continuing Education, 47*, 69-98.
- Parker, A. (1999). A study of variables that predict dropout from distance education, *International Journal of Educational Technology* [Online], 1(2). Available: <http://www.outreach.uiuc.edu/ijet/v1n2/parker/>
- Rotter, J. (1966). Generalized expectations for internal versus external control of reinforcement. *Psychological Monographs, 80*, 1-28.
- Rotter, J. (1976). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology, 48*, 56-67.

## **About the Author:**

**Dr. Angie Parker** received her Ph.D. from Arizona State University where she majored in Distance Delivery of Instruction. Upon graduation, she taught for ASU for three years and conducted research on the effect of distance on learning.

Angie was also instrumental in developing an online instruction program while she chaired the Department of Educational Technology at Gonzaga University in Spokane, Washington. Angie believes that distance delivery is not right for every student nor is it the answer for every business or institution of higher learning. Instead, distance delivery must be done with extreme skill and care and with the student as the priority.

Today, Dr. Parker is the Associate Dean of Distributed Learning for Yavapai College in Prescott, Arizona. She oversees the development and delivery of numerous courses per semester. Delivery methods include interactive television, Internet, and Cable television.

Dr. Angie Parker, Associate Dean  
Yavapai College, Distributed Learning  
1100 Sheldon Street, Prescott, Arizona, 86301  
(928) 776-2074 [angie\\_parker@yc.edu](mailto:angie_parker@yc.edu)