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Donald G. Perrin, Executive Editor

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## Editorial

# The Borg

Donald Perrin

Many innovative concepts come from writers of science fiction, and this modern media environment, films, television and computer games and simulations. The Borg is a collective intelligence of many individuals which gives it incredible power. In Startrek, individuals are dehumanized and chained permanently to the network. In the real world, the Internet is an open source of global intelligence to stimulate intellectual and economic growth.

Another kind of Borg is the SETI Institute, which uses the slack processing time of thousands of computers to process signals from radio telescopes in a Search for ExtraTerrestrial Intelligence. SETI also includes the Carl Sagan Center for the Study of Life in the Universe and the Center for Education and Public Outreach. The SETI mission is to explore, understand and explain the origin, nature and prevalence of life in the universe. More than 150 scientists conduct some of the most profound searches in human history — to know our beginnings and our place among the stars.

In education, we focus on individual human development using group and individualized methods of instruction. Learning is stimulated in three domains: cognitive, affective, and psychomotor at levels of increasing difficulty and complexity. *Cognitive* involves knowledge and development of intellectual skills. *Affective* emphasizes feeling and emotions. Psychomotor is concerned with motor skills and coordination of mind and body. The game plan is a curriculum intended to prepare the learner for a world that does not yet exist. Learning in a traditional classroom comes from lectures, demonstrations, discussions, and guided activities. The flow of intelligence is principally from the teacher, textbook, and learning resources to students. The internet is a world wide web for sharing knowledge and experience.

Modern learning methods place more emphasis on feedback, interaction, and team-based activities. The learner is active and assumes responsibility of his or her own learning. The teacher lectures less, if at all, and serves as guide, tutor and problem solver. Diagnostic-prescriptive approaches determine what is to be learned and the most effective way to learn. Supportive learning environments, interactive technologies and the collective intelligence of class members provide a wealth of opportunities for learning wh ere students interact, explore, learn, and share ideas together.

Collective intelligence and networking give Borg-like power to the learning process. When students share, the lecture becomes a discussion, and the discussion becomes a dialog. In discussion we are trying to make a point; in dialog we are exploring ideas. Often dialog leads to activities to test ideas and put them into practice.

Unlike the Borg which responds to a single power, collaboration and team work foster productive exploration, communication and learning experiences for all who participate. The result is continual renewal and opportunity for innovation and creativity.



**Editor's Note:** An exquisitely functioning learning experience in a vibrant organization is the desire of every learner and teacher. Read about this successful learning community!

## **SLATE: A Community of Practice for Supporting Learning and Technology in Education**

**Anthony A. Piña, Kenneth P. Sadowski,  
Carol L. Scheidenhelm, Paul R. Heydenburg**

### **Abstract**

Communities of practice are an effective and economical way to provide up-to-date training and resources for those who lead and support learning management systems, instructional design and professional development efforts at schools, colleges and universities. In this paper, the authors will 1) provide a definition of communities of practice; 2) document the establishment, characteristics and growth of SLATE, a dynamic and successful community of practice and 3) provide ideas and recommendations for those wishing to establish a professional community of practice.

**Keywords:** Community of practice, learning management systems, course management systems, instructional technology, distance learning, e-learning, Blackboard, professional development, collaboration

### **Introduction**

Professionals who provide instructional design support, faculty technology training or supervision of learning management systems (LMS) at schools, colleges and universities, often find themselves in a solitary position. In many instances, providing leadership and support of educational technology may be the purview of a single individual on campus (Born, 2007). Decisions about adopting or upgrading hardware or software, troubleshooting systems, training new users or supporting existing users, are often difficult to make in a vacuum. Even when an institution is fortunate enough to employ an educational technology group with several members, there are many instances where experience and expertise outside of the institution may be needed.

A myriad of books are available to assist the educational technology professional in the planning and management of technology (Picciano, 2006), administration of distance learning (Shelton & Saltsman, 2005), learning management systems (Southworth, Cakici, Vovides & Svacek, 2006), training design (Carliner, 2003), multimedia production (Golding & Ray, 2007), and general technology issues (Shelly, Cashman & Vermaat, 2008). Although these may be useful resources, the nature of book publishing makes them less helpful for up-to-the-minute technology needs, such as the latest hot fix or an upcoming upgrade.

Conferences and formal training sessions can also be important sources for upgrading one's skills and gathering current and essential information. However, in the era of shrinking travel funds, these may occur infrequently—if at all. Sauve (2007) points out that “Most organizations are trapped in the economics of formal learning approaches, which can be expensive, time consuming, and inflexible” (p.23). “The reality is that in many industries in which situations change rapidly, formal learning once or twice a year doesn't provide employees with the experience or knowledge they need to find ongoing success on the job. This means that organizations must revamp their budgets and shift their resources from formal learning settings to informal situations in which the majority of learning actually takes place” (p.22).

One source of effective, economical and up-to-date informal learning is a local or regional community of practice. These entities, which can include user groups, special interest groups or meetings of people with similar interests, can be invaluable resources for educational technology professionals. In this paper, we will document the establishment, characteristics and growth of SLATE, a dynamic community of practice for those who lead and support learning management systems, instructional design and professional development at schools, colleges and universities in the U.S. Midwest.

## Community of Practice

The concept of a community of practice is most closely associated with the work of social learning theorist Etienne Wenger (e.g. Lave & Wenger, 1991; Wenger, 1998; Wenger, McDermott & Snyder, 2002). While the idea of learning as a result of social activity has been around for many years (e.g. Bandura, 1977; Bandura & Walters, 1963), Wenger's community of practice "challenges intra-individual, transmission models of learning that posit a largely unproblematic event in which teachers speak and students learn—the success of such events being dependent on the competence of both the learner and the teacher. Instead learning is positioned as embedded in wider social and historical practices, which interact to generate valued practices within a given community" (O'Donnell & Tobbell, 2007, p. 315).

### Defining a Community of Practice

A community of practice can be understood as a group of people who are united by a common interest or expertise (Wenger, 1998). These people form a network that allows peers, mentors and subject matter experts to interact in order to address common issues and concerns (Sauve, 2007). Communities of practice are further characterized by activities that establish, extend and maintain relationships between individual members, such as organizing informal meetings to support mutual information exchange (Zboralski, Salomo & Gemuenden, 2006).

Wisker, Robinson & Shacham (2007) identify the three key principles of a community of practice as:

- *Enterprise*: Shared goals, mutual accountability and fluent communication.
- *Mutual engagement*: Individual and/or group connection.
- *Shared repertoire*: Pooling of resources, both material and emotional.

According to Sauve (2007), "The peer-to-peer environment of CoPs fosters employees' natural trust in advice from someone in their situation. It also encourages emotional as well as instructional support. CoPs focus on context-specific information sharing rather than advice sharing. Because users seek to solve immediate problems, on-demand information availability is enormously beneficial" (p. 23).

In a survey conducted by the American Productivity and Control Center involving over 700 participants in communities of practice (Vestal, 2006), respondents reported that the most valuable benefits of participating in a community of practice were:

- Quick solutions to problems
- Ability to ask & answer questions of peers and subject matter experts
- Best practices transfer
- Ability to participate in discussions with other members
- Innovate new solutions
- Documentation created by the community



## Legitimate Peripheral Participation

One of the most oft-mentioned aspects in the community of practice literature is the concept of legitimate peripheral participation proposed by Lave & Wenger (1991). As explained by Schlager & Fusco (2004), “Newcomers gain access to the community’s professional knowledge tools and social norms through peripheral participation in authentic activities with other members. New practices and technologies are brought into the community by leaders, newcomers, and outsiders, and are adopted by the community through the discourse of its members and the evolution of practice over time.” (p. 3). In this way, the new member (or novice) becomes acquainted with the knowledge base and culture of the community and eventually becomes an experienced and “full” participant (Wiessner & Sullivan, 2007).

## Context of Communities of Practice

Much of the literature looks at communities of practice from within the context of a single organization (e.g. Zboralski, Salomo & Gemuenden, 2006). However many communities of practice “are distinct from, and frequently extend beyond, formal organizational structures, with their own organizing structures, norms of behavior, communication channels, and history. Members often come from a larger professional network spanning multiple organizations, drawn to one another for both social and professional reasons” (Schlager & Fusco, 2004, p.3). Active communities of practice can be found in business and industry (Allee, 2000; Sauve, 2007), higher education (O’Donnell & Tobbell, 2007; Wisker, Robinson & Shacham, 2007),

K-12 schools and districts (Schlager & Fusco, 2004), professional associations (Wiessner & Sullivan, 2007) and the Military (Dixon, Allen, Burgess, Kilner & Schweitzer, 2005). Initially, communities of practice were usually portrayed as self-organizing networks in which anyone can participate. However, a new trend has emerged in which organizations strategically support existing informal networks and deliberately establish communities of practice with managed memberships (Zboralski, Salomo & Gemuenden, 2006).

## SLATE

SLATE, an acronym for “Supporting Learning And Technology in Education,” is a local community of practice, consisting of technology leaders from research universities, comprehensive universities, community colleges and K-12 school districts. Although recognized by Blackboard as one of its premier user groups (Pattinsky, 2005), the focus of SLATE is not exclusive to a single learning management platform or technology (Piña, 2006). One important reason for the success of SLATE is that it does exist independent of Blackboard as a means for members to assist each other with issues related to Blackboard, specifically, but also to online teaching and learning in general.

The professionals involved in SLATE include administrators, faculty and classified staff, all of whom are involved in the use of technology for learning and teaching at their institutions. Titles and job tasks for SLATE members vary greatly and include department or program administration, technical systems management, instructional design, online course development, multimedia production, faculty training, client support or faculty. Many members perform several of these duties.

Wisker, Robinson & Shacham (2007) describe the stages of development for communities of practice that can be used as a framework for an investigation of SLATE as an example of a successful community of practice:

- *Potential*—initially there might be quite a loose network of people with similar issues and needs.
- *Coalescing*—people come together, finding value in learning activities.

- *Maturing*—after time, the community itself takes charge of its practice and grows, developing a learning agenda, joint activities and shared commitments. It is likely to produce changes and artifacts.
- *Active*—the community goes through cycles of activities. To remain buoyant and engaged, it needs to sustain energy, renew interest, recruit novices and gain influence.
- *Dispersing*—the community can come to the end of its usefulness and people move on.

## Potential

### Conditions Leading up to the Formation of SLATE

The genesis of SLATE occurred in March, 2002 at the Blackboard Users Conference in Phoenix, Arizona (Blackboard Inc, 2002). Kenneth Sadowski, then Associate Director of Academic Technologies at the University of Chicago, was seeking answers to various questions regarding operations and support of the U. of Chicago's new Blackboard LMS. Speaking with individuals from several colleges and universities, he found that other institutions were experiencing the same difficulties as his own. Often, there was only one individual on a campus that was assigned to administer the LMS and—more often than not—the person had no prior experience with this type of system. Blackboard was still a new company that was in the process of establishing itself and was years away from becoming the dominant LMS player in higher education. Opportunities for customers to receive individualized support, documentation and training were very limited.

Upon returning from the conference, Sadowski approached Chad Kainz, Senior Director of Academic Technologies, University of Chicago, about the idea of holding meetings with other institutions to discuss common learning management issues. Kainz encouraged Sadowski to proceed with his idea, and Sadowski began contacting colleagues at a dozen Chicago-area colleges and universities. There was a great deal of interest in getting together and a meeting was scheduled for May, 2002 at the University of Chicago.

## Coalescing

### Meeting Together

Representatives from eight institutions of higher education attended the first meeting: DePaul University, Joliet Junior College, Moraine Valley Community College, Northeastern Illinois University, Northern Illinois University, Northwestern University, Purdue University at Calumet and the University of Chicago. Most had been using Blackboard for less than two years.

Sadowski began by discussing the conversations that he had with Blackboard User Conference participants and the meeting concluded after 2 ½ hours of brainstorming. It was decided unanimously that this had been a productive experience and that another meeting should be scheduled for the following month. At the next meeting, the discussion focused on strategies for connecting and helping each other and it was decided that a regular monthly meeting would be most effective. The group began to grow, as each institution began sending multiple people to participate. Word soon spread among other local institutions, who were welcomed into the fold.

### Naming of SLATE

At the third meeting, held at the Calumet Campus of Purdue University, it was decided that the group needed a unique identity and name. Several names were suggested, most containing the acronym "BUG" (for Blackboard User Group). Neal Holman of Moraine Valley Community College suggested the name "SLATE," as it was a word play on both "Blackboard" and "Chalk" (the name given to the University of Chicago's implementation of Blackboard). The fact that "BUG" was not adopted as the group's name, helped to clarify that its activities would not center

exclusively upon a single application or technology. The secondary title, “Midwest Blackboard User Group,” reflected the intent of SLATE to reach beyond the metro Chicago area.

### **Mission and Focus**

Although the name “SLATE” was chosen as a word, it was soon transformed into an acronym for Supporting Learning And Technology in Education to fit the group’s mission “To support learning and technology in education through communication, collaboration, and innovation while developing a community of practice” (SLATE, 2008). Initial meetings focused upon the questions and problems that users were experiencing in operating and supporting Blackboard: how to perform different actions and procedures on the system, and how to use instructional and administrative tools. Later meetings began to focus on a wider range of topics, such as documentation, help desk procedures, training of faculty to use technology and student support.

### **Maturing**

#### **Growth of SLATE**

In its first five years of existence, SLATE has grown from eight to 60 institutions. These include four K-12 school districts and three honorary member institutions from England: Oxford University, Durham University and University of Teesside. While the bulk of membership resides in Illinois and Indiana, SLATE counts among its members institutions located in Missouri, Kentucky, Oregon, St. Thomas and Antigua (SLATE, 2008).

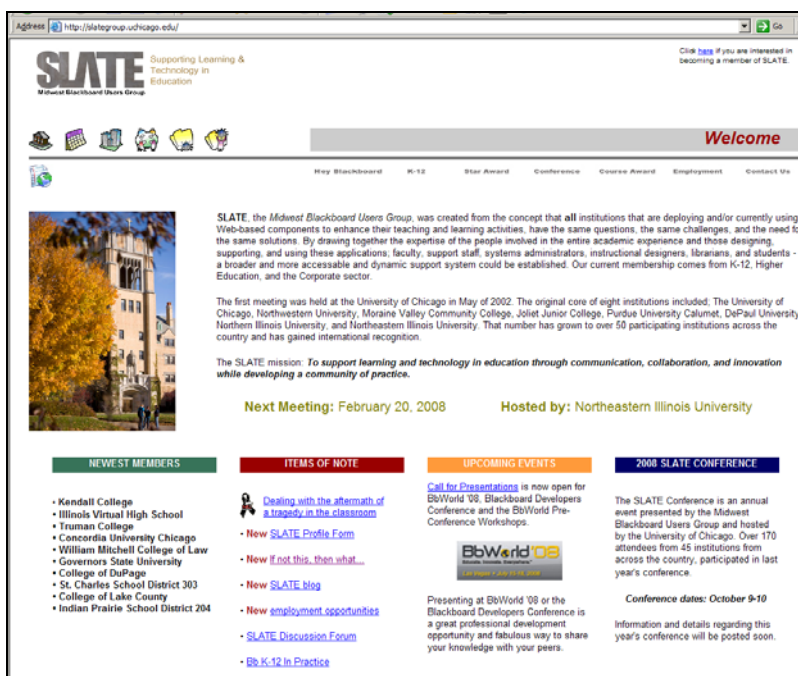
The group’s growth has been primarily by word of mouth by members while attending conferences or visiting other institutions; a growing percentage, however, have found the group through the website and via referral from Blackboard representatives. SLATE members routinely bring colleagues to one of the monthly meetings, and those colleagues return to become participating members of SLATE—following the pattern of Lave and Wenger’s legitimate peripheral participation (Lave & Wenger, 1991). The group has repeatedly discussed the need to keep membership free and open to all institutions interested in joining the discussion of best practices for supporting teaching and learning online.

Meetings are held typically on the third Wednesday of each month (excepting January and August) and are hosted by one of the member institutions, which usually provides coffee, juice and pastries at the beginning of the meeting and lunch after the discussions and presentations. Following lunch, there is generally an informal time created for networking and interaction. Topics and presentations at SLATE meetings vary according to the interest of members. Presenters at meetings include SLATE members, invited guests demonstrating best practices and vendors. Attendance at monthly SLATE meetings varies slightly by location, topic and member availability, but is usually in the range of 20-35. The May, 2008 meeting at Northern Illinois University was attended by over 50 participants.

#### **SLATE Website, Listserv & Blog**

The SLATE website, located at <http://slategroup.uchicago.edu>, serves as a central repository for resources and information of interest to the group. Links include:

- Calendar of dates, locations and topics of SLATE meetings and event
- Information about the SLATE Conference
- Descriptions of SLATE initiatives (Hey Blackboard, K-12, SLATE University, Documentation Repository)
- Link to SLATE Blog
- Community Profile



**Figure 1: SLATE website (slategroup.uchicago.edu)**

Of particular note is the Community Profile which gives a description of member institutions, including a brief history, student enrollment, number of faculty, and contact information of SLATE members. At the suggestion and with the assistance of Jack Corliss of Loyola University, the profile was recently expanded to include specific information to help SLATE members connect with those whose LMS implementations are similar to their own. The profiles now provide information about:

- the version of LMS in place
- other LMS's deployed by the institution
- third-party vendor applications integrated with the LMS
- the campus ERP system (Banner, Peoplesoft, Datatel, Jenzabar, etc.)
- whether the LMS is hosted onsite by the institutions or offsite by a vendor
- the anticipated timeframe for the next LMS upgrade
- Names of campus contacts

### **SLATE Listserv**

In addition to the website and monthly meetings, SLATE members communicate with each other is the SLATE Listserv, hosted by Yahoo Groups. SLATE members have used the Listserv to conduct surveys and research, ask specific technical, policy and procedure questions, solicit ideas, advertise open positions at their respective campuses, and publicize SLATE meetings and events of interest. Additionally, the list is frequently used to provide follow-up information on issues raised at the monthly meetings, adding to its relevance and timeliness. Many members of SLATE also participate in the Blackboard User Listserv (<http://lists.asu.edu/archives/blkbrd-l.html>) and Blackboard Administrator Listserv (<http://lists.asu.edu/archives/bbadmin-l.html>) hosted by Arizona State University.

## SLATE Blog

In order to find a richer and more interactive alternative to the email-based listserv, the SLATE Blog at <http://slategroup.blogspot.com> was conceived and created by Jason Rhode of Northern Illinois University. The Blog provides a forum for SLATE members to view and comment on minutes of SLATE meetings and announcements of interest.

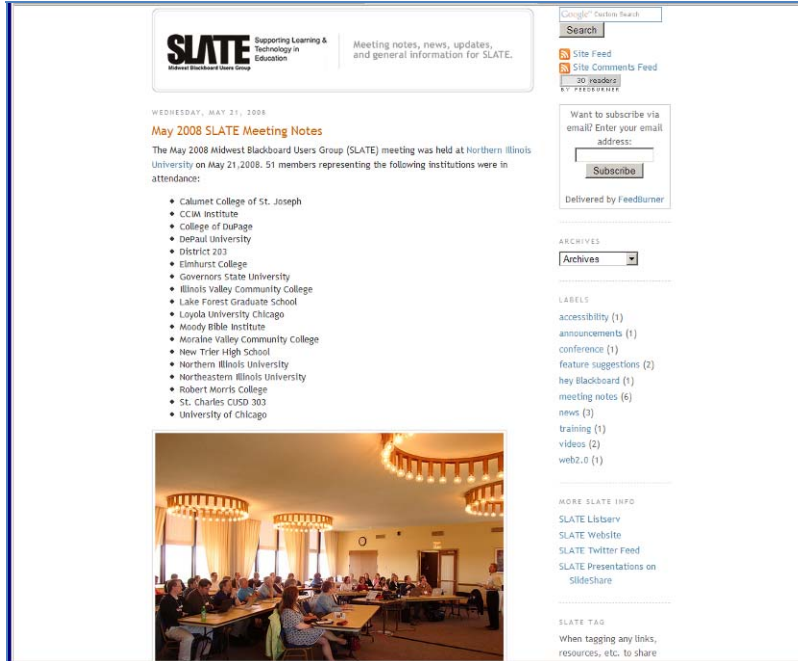


Figure 2: SLATE Blog ([slategroup.blogspot.com](http://slategroup.blogspot.com))

## SLATE Conference

Early in SLATE's existence, participating members determined that a local conference should be organized as a way to expand the group's activities and benefit faculty members and others unable to attend the monthly meetings. SLATE members, with support from the University of Chicago, worked out the conference logistics, sending e-mails and publicizing the conference at their institutions. A major accomplishment was to secure the University of Chicago's Gleacher Center as the conference venue; this has proven to be a versatile and conveniently-located conference site close to hotels, public transportation and Chicago's many amenities.

The first SLATE Conference was held in October, 2003 and was deemed a success, with members presenting 12 sessions to over 100 attendees; the conference was a one-day event. Three keynote speakers at the conference included Chad Kainz, Senior Director of Academic Technologies at the University of Chicago, David Yaskin, Vice President of Strategy and Quality at Blackboard, Inc. and David Thornburg, Director of Global Operations at the Thornburg Center. For the fifth anniversary of the SLATE Conference in 2007, the event was expanded by an extra half day, to accommodate the increase in the quantity of quality sessions. Nearly 175 attendees participated in 35 concurrent sessions. The registration fee has been kept to a minimum, allowing the conference to break even on the cost of the Gleacher Center venue. Keynote speakers at the SLATE Conference have included Matthew Pittinsky, Chairman of the Board of Blackboard, Inc., Gordon Freedman, Vice President of Education Strategy, Blackboard, Inc., Gregory Jackson, Vice President and CIO of the University of Chicago and Stuart Lee, Head of Learning Technologies at Oxford University.

The most positive thing about the conference is that it addresses the needs members found lacking in larger conferences, such as Blackboard World and Educause; sessions tend to address best practice issues relevant to faculty and support personnel alike. Each year, the number of session proposals has grown, indicating that interest in not only attending but also presenting is perceived as a benefit to the SLATE community. Since the conference is sponsored, organized, conducted and attended by community members, topics are timely and relevant to the group's immediate needs.

### **SLATE Star Award**

The SLATE Star Award was established in 2004 as a way to recognize an individual who has shown leadership, demonstrated initiatives, presented new ideas, improved procedures, established effective relationships or provided substantial resources that have affected the success and promotion of SLATE, the educational experience, and/or the general Blackboard Community of Practice. Nomination and selection of award recipients is done by a vote of peers; one award is given annually.

### **SLATE and Blackboard**

Other than the SLATE website, which is hosted by the University of Chicago, SLATE maintains no formal affiliation with Blackboard or any other entity. This "external and independent" relationship has proven to be advantageous to both Blackboard and SLATE. SLATE meetings are not perceived by members as complaint sessions, but are undertaken as an open exchange, with the goal to evaluate and improve both the product and the way that it is implemented at members' institutions. About 1/3 of the SLATE monthly meetings are attended by one or more Blackboard representatives, who solicit feedback and dialog with SLATE members. SLATE members provide to Blackboard representatives honest input and constructive criticism from the "front lines" (Piña, Green & Eggers, 2008). "Hey Blackboard," a feature on SLATE's website, provides a list of features that its members would like to see in future releases of the LMS.

Blackboard executives have recognized SLATE as one of its premiere users groups (e.g. Pattinsky, 2005) and have sent a wide range of representatives (including account executives, technical support managers, product development engineers and Vice Presidents) to meet with SLATE members. This acknowledgement is based on SLATE's composition; member institutions represent a broad user base of Tier 1 research institutions, comprehensive universities, community colleges and K-12 districts and it is an active and thriving entity.

Recently, Blackboard developed a template for user profiles based on the Community Profiles section of the SLATE website.

## **Active**

### **Keeping SLATE Growing & Vibrant**

According to Vestal (2006), the true value of a community of practice comes from the ongoing interaction and work of the group. Sustaining the value involves moving into a sustaining and evolving mode to match the changing needs and goals of the community's members. Here again, the monthly meetings and SLATE conference help the community to remain in touch with issues and changing goals of individual member institutions as well as the SLATE collective.

### **The Members**

Interviews with various SLATE members about what keeps the group vibrant yield very consistent answers, the most common being that SLATE is composed of members with a vested interest in moving online technologies forward. The founding SLATE members and those that have followed and who continue to participate are committed to their profession, committed to

their institutions, and committed to enhancing the role of online teaching and learning in the global campus environment.

### **Give and Take**

Dr. Steven R. Covey, in his widely acclaimed book *The Seven Habits of Highly Successful People* (Covey, 2004), introduces the idea of an emotional bank account, where one must make “deposits” of trust and service before “withdrawals” can be made. The SLATE community has created its own large account, where members may “deposit” information, resources, ideas, advice and best practices and may “withdraw” when they need these services from others. Success of the community is evident in the significant number of positive exchanges among community members, both during meetings and through the listserv. Members understand that the “bank” of knowledge created by SLATE provides “interest dividends” far beyond any initial “deposits” made.

### **Inclusion**

SLATE is an egalitarian organization; since the original cadre included both research and teaching institutions, it has been understood that all SLATE members are on an even plane

This inclusion also applies to technology. SLATE is not exclusive to a particular technology or to a single LMS. Angel, Moodle and Desire2Learn are being used by some SLATE members, who have similar issues of training and support as those using Blackboard. As a result, SLATE’s inclusiveness supports the community’s main goal: to provide a forum for the understanding and improvement on teaching and learning online. Before the acquisition of WebCT by Blackboard (Piña, 2007), members who were running WebCT at their institutions regularly attended and presented at SLATE meetings.

### **SLATE Retreat**

The American Productivity and Quality Center suggests that the working norms of a community of practice be assessed yearly and realigned to ensure that the best results are being achieved (Vestal, 2006). In 2005, SLATE members accepted the invitation of Floyd Saner of Goshen College to host a session at their Indiana campus. Goshen College representatives were regular attendees at the Chicago-area meetings, travelling to and from meetings in one day. But since the trek to central Indiana was more substantial than locally-hosted meetings, members decided to make the Goshen trip a two-day event designed for reflection and planning. The SLATE retreat has become an annual event. During this time, SLATE members perform a review and evaluation of the year’s activities, determine goals, strategies and modifications for the upcoming year and prepare the “last minute” arrangements for the upcoming October SLATE Conference.

### **Outreach Activities**

A number of SLATE members have engaged in professional outreach activities based upon contacts made during SLATE meetings or conferences. Although many of these activities have been “pro bono,”--as in cases where SLATE members have visited other institutions to help with LMS issues or to help other user groups establish themselves--some have been hired as professional consultants and/or trainers for projects outside their home campuses. Blackboard recently arranged for Ken Sadowski, SLATE founder, to meet with customers in Japan about how to establish a SLATE-like community and provide a keynote address to a group of potential community members. Anthony Piña of Northeastern Illinois University (now with Sullivan University) and Julian Scheinbuks of Chicago State University, collaborated on a grant funded project to establish online faculty team-teaching partnerships among three institutions (Piña & Scheinbuks, 2008).

## **Dispersing**

The last phase of Wisker, Robinson & Shacham's model of communities of practice is dispersion, where a community comes to the end of its usefulness and its members move on (Wisker, Robinson & Shacham, 2007). Although it is possible that SLATE may disperse sometime in the future, there appears to be no indication that this will occur anytime soon. In fact, new institutional members continue to join at a steady rate and monthly meeting membership climbed to an all-time high in May, 2008. New members are becoming more active in the community's activities and additional ideas interspersed into traditional meeting agendas.

## **Ideas & Recommendations for Communities of Practice**

What can be learned from SLATE as a model for a successful community of practice? Informal discussions with Slate members at monthly meetings and the annual conference have yielded the following ideas and recommendations:

### **Get a Group of Committed Individuals**

Most SLATE members attribute the group's success to the level of commitment of those who plan the meetings, host the meetings, share resources, give presentations, answer inquiries and perform all of the "behind the scenes" work to make the various components of SLATE work. Members give the lion's share of the credit to Ken Sadowski, affectionately referred to as "Mr. SLATE," but Sadowski is quick to point out the significant and constant work done by other members of the group.

### **Focus Upon the Needs of Group Members**

During the first few SLATE meetings, an assessment of the needs of the participants helped to determine the direction that the group should take. Those needs became the topics for future meetings. As members' needs have evolved, so have the meeting topics, the website and the conference. Reflection and planning at the annual retreat serve as a renewed needs analysis for each upcoming year. SLATE meetings are always productive because there are clear topics and goals identified and there is never a situation where the group meets just for the sake of meeting.

### **Buy-In and Support from Institutional Leaders**

One of the critical early steps in establishing SLATE was the ability of the members to convince their supervisors that participation in SLATE would be a worthwhile activity, one that would provide a good return on investment. Nearly all SLATE members are able to attend meetings while "on the clock" at their institutions. Had members been required to take days off to attend SLATE activities, it would, at best, have had limited participation and, at worst, would have stifled it completely. Campus leaders at member institutions host SLATE meetings, fund the lunch expenditure and periodically provide an official welcome to SLATE members at the start of the meetings.

### **Meet Regularly and Predictably**

SLATE meetings are usually held the third Wednesday of each month--except during January and August--at a member institution. This consistency allows for members to reserve the meeting on their calendars. Meetings start typically at 10:00 am, include a lunch (provided by the host institution) and end at approximately 2:00 pm, allowing members to miss the heaviest traffic while going to and coming from the meeting. Members frequently remain after the official session to pursue informal networking opportunities.

Although SLATE members have found it advantageous to travel and meet face-to-face (making it more difficult to be called away on other campus business), smaller communities of practice in more geographically dispersed areas may take advantage of online virtual meeting environments, that allow for synchronous audio, video and desktop sharing widely available on many campuses.



SLATE has experimented with having guest presenters at remote locations speak to the assembled community with a moderate degree of success.

### **Make Everyone Equal**

Although most SLATE members hold a leadership role, no one in the group is a top executive at his or her institution. This may influence both the type of interacting among group members (i.e. the executive is usually in charge of the group) and the focus of discussion (the executive may be more concerned about budgets, staffing and other “top level” issues). In SLATE, members representing K-12 schools, community colleges, small colleges and large universities have an equal voice.

### **Research Existing Communities of Practice**

Many new members of SLATE were initially unaware that a group that could meet their needs already existed. Practitioners interested in joining a community have many regional options available that can be discovered with a bit of research. Contacting a vendor or spending some time searching on Google for an existing user group or community of practice may prevent having to “reinvent the wheel.”

### **Conclusion**

The benefit of SLATE participation has been recognized by its members almost since its inception. SLATE’s success is evident in its growing membership, increased attendance at meetings and participation in the annual conference (both in number of proposals submitted and number of interested attendees); additionally, Blackboard Corporation has cited this organization for its mission and contributions to the larger Blackboard community. This success comes from a variety of sources, but focuses on the open nature of the meetings, the input and sharing among members, strong leadership and regular meetings with set agendas. As with any vibrant organization, new ideas and a continual refresh of goals and needs are essential to keep SLATE a viable and productive addition to its community members. Through the efforts of its members, the future for SLATE and its contribution to the academic community it serves is positive and promising.

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**Editor's Note:** China is undergoing extensive growth and development with up to thirty million people each year moving from rural areas to the cities. This poses critical requirements for rural education to be comparable to education available in the cities. This paper describes programs in Gansu Province to reduce the gap between big-city and rural education in primary and secondary schools.

## The Rural Distance Education in Primary and Secondary Schools in Gansu, China

Meiting Bai

China

### Abstract:

This paper gives an overview of the development and status of Distance Education in Gansu China since the launch of the program in 2004. It reports three models in Distance Education, the funds from international, national, province and local government, achievements of the project, including infrastructure, teacher training on professional and information techniques, benefit to students and the social impact. This article concludes by describing the prospect and challenges for Distance Education in Gansu China.

**Keywords:** rural Distance Education, interactive and multimedia, model, primary school, secondary school, Gansu, China.

### Introduction

Distance Education is planned learning is received in a different place from where the teaching originates. As a result requires special techniques of course design and instruction, and electronic communication to deliver instruction and facilitate interaction, as well as special organizational and administrative arrangements (Moore & Kearsley, 1996). The development of Distance Education can be divided at three stages; the first, via mail system (1950s-1970s), the second via radio and television (1980s-1990s) and the third stage is interactive and multimedia via the Internet, (2000-) (Education project,2008, Robinson, 2008). Distance Education plays an important role in education and economic development in China, especially in rural areas (Jelen & Alon, 2005; Wang & Crook, 2006; Wang & Kreysa, 2006; Zhang & Hung, 2007; Zhao, 1988). In China, 70% of the population inhabits in rural areas with 160 million students in primary and secondary schools (MoE,2004). The coastal and eastern parts of China, rural and urban, have wide economic and social gaps. The Chinese government has provided special funding for projects in western and rural China, using Distance Education as one of key strategies for achieving development goals and shortens the gap among districts.

Gansu is one of the poorest provinces located in northwest China at the junction of the Loess Plateau, Inner Mongolian Plateau, and Qinhai-Tibetan Plateau. About 75 per cent of the population of 26.4 million is rural. Gansu Province covers an area of 450 km<sup>2</sup> ; much of the province is dry and dusty with serious soil erosion. Gansu is a typical plateau area with many mountains. There are 3.5 million ha of cultivated land, more than 70% of which is rain-fed and less than 30% is irrigated. The majority of the population is Han Chinese, but there are 44 ethnic minority groups, the largest being Tibetan, Hui, Dongxiang, and Mongolian.

Gansu has carried out the Distance Education program at an international level (EU-China Gansu Basic Education Project - jointly funded by the European Union and the Chinese Government from 2001 to 2007), national level (National Compulsory Education Scheme in Poor Areas, National Modern Distance Education Program in Rural Areas, and Modern Distance Education Program in Western Primary and Secondary Schools from 2003 to present) and province level

(Education project, 2008). These project great improved education quality and the education environment in rural areas of Gansu. School enrolment rates have greatly improved over the last decade, and in 2006 were 98.3 per cent for primary education and 88.3 percent for junior secondary. Most teachers are qualified according to old or new national standards (i.e., 96% of primary and 88% of junior secondary) though teaching quality varies (Introduction of Gansu Education, 2006; Robinson, 2006).

### **Distance Education Models**

Like the whole country of China, three rural Distance Education models have been used in Gansu Province. Model one is to establish teaching disk player sites with a 34 inches color TV, DVD-player and a set of teaching materials including video CDs. Teachers were trained by watching disks with contents and teaching resources designed and performed by the excellent teachers from the whole country. For example, Chinese courses for primary education were recorded by the top ten teachers from the national course teaching competition. Together they designed how the course should be carried out and one who good at expression was selected to give a lecture in the video. The simulated class was about 15 minutes and may include 3 to 4 parts, or even more. Teachers can use it in their class directly, they can watch part of the video with their students, then stop, discuss, and continue the video. Therefore teachers and students in the live class could benefit from communication in the video. This methods has advantages in music and English learning. The key point of this model is the quality of the disk. Each site cost 3000 RMB – about USD 500 (Model 2005; Wang, 2005). This model was usually used at earlier stages of rural Distance Education.

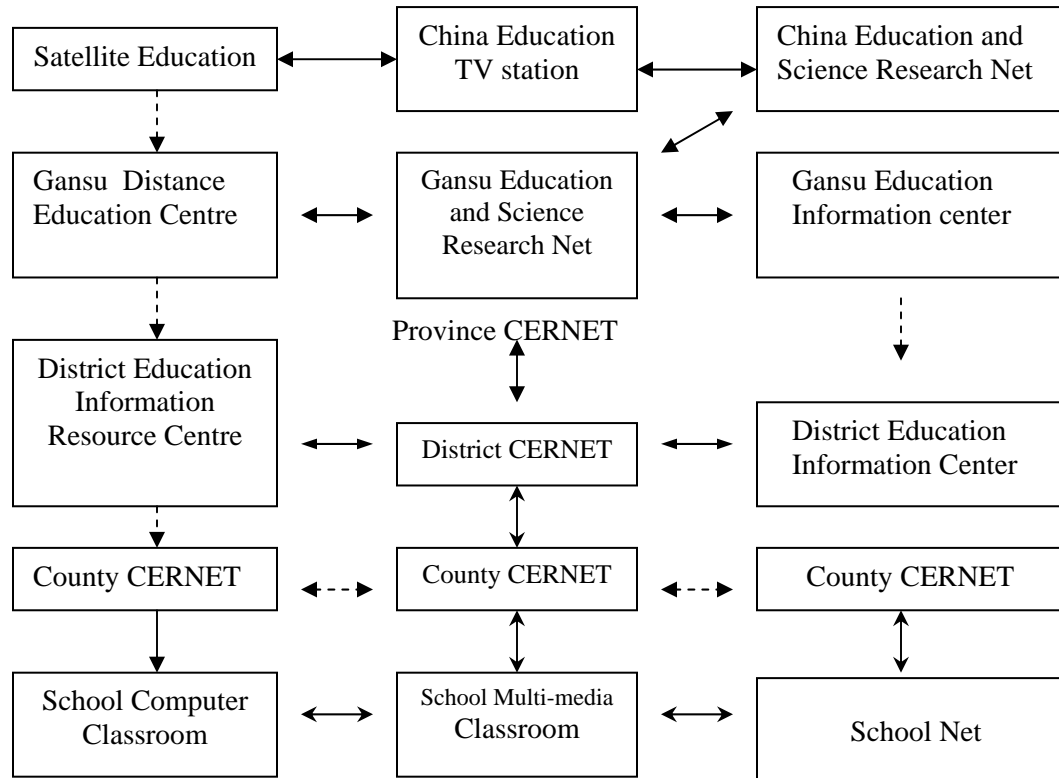
Model two is satellite acceptor, the equipment include satellite reception and delivery system, a TV, computer, DVD-player and teaching resources for all grades in primary and secondary school. China Education Satellite sends teaching materials like multimedia courseware to all sites. This model has the function of Model 1. Teachers can watch and copy the teaching material from TV and use them in their own class. The resources were evaluated by experts before being sent to the site and only high quality and appropriate material is used. The key purpose of this model is firstly, the country should have good resource and secondly, all of these materials are free to the site. Each site of this models cost 16,000 RMB (Model 2005; Wang, 2005).

The third model is on line learning and teaching. The equipment involves computers linked to the internet, a multi-media classroom, model one and model two equipment and materials. The basic character of this model is information technique learning, learning on line and computer assisted teaching. Teachers can be trained from on line real time courses, down load teaching materials, edit on the computer, prepare teaching plan etc. With this model students could operate the computer and learn in the same way as the students in cities. Hands-on experience with computers improves interest in learning and students learn quickly. Each site cost 150 000 RMB (Model, 2005; Wang, 2005). This model is not widely used and will be developed further in future.

### **Distance Education organization in Gansu Province**

There are 5 levels for rural Distance Education in Gansu province. The satellite of Education, China Education Station and China Education and Science Research Net are the first level, they afford and transmit the original education resources. Gansu Distance Education (Jointly founded by Northwest Normal University, Gansu Radio and TV University and Gansu Education Technology Center in Gansu on March, 2001, Guangmin Daily, 2001) and Gansu Education and Science Research Net, Gansu Education Information Center are the second level. These accept, combine and transmit , resources. District and County education information centres are in the third and four level; they accept, combine and further transmit the resources. The computer

classroom, multi-media classroom and school network are the final receptors in this system and will feedback to the previous levels (figure 1).



**Figure 1. The organizational structure of the Distance Education system in Gansu**

Note: Updated from [http://www.gs.xinhuanet.com/jdwt/2005-12/16/content\\_5835962.htm](http://www.gs.xinhuanet.com/jdwt/2005-12/16/content_5835962.htm)

## Financial Input and Achievements

From the year 2004 when the Gansu government began to carry out national Distance Education in rural areas of China, to October 2007, 363 939 000 RMB has been allocated to Distance Education in rural areas. The Chinese government funded 250 153 000 RMB and Gansu province and district government jointly funded 56 781 000 RMB and 57 005 000 RMB, respectively (Gansu Daily, 2007). The EU-China Gansu Basic Education Project (EU-China GBEP) invested 15 million Eurodollar to alleviate rural poverty in the poorest 41 of Gansu Province's 86 counties and the Chinese government jointly funded 2 million Eurodollars and provided 103,550 scholarships for poor children to enroll to school (Robinson, 2008). As a result, education quality was greatly improved and more children had the opportunity to go to school. About 15,528 schools in rural areas completed Distance Education installations and more than 3,955,200 students benefited from Distance Education. Almost all secondary schools have one computer room and most primary school have a satellite acceptor teaching system. The ratio of students to computers has improved from 29:1 to 13:1 (Gansu Economic Daily, 2005). Totally about 86.08% primary and secondary schools in rural areas have Distance Education systems. According to the Gansu Distance Education office, all primary and secondary schools in rural areas will be served by Distance Education systems by the end of 2007.

At present, Gansu has set up a platform of Distance Education and a channel to send high quality teaching resources to meet village needs. This technique for course delivery has been popularized in secondary schools where it is used in combination with live instruction. Twelve province level centers of Distance Education for teachers training were set up to train all teachers from rural

areas on the professional content and use of information techniques. There were 11,893 teachers trained. This effectively resolved problems in teaching and greatly improved the teaching quality within rural areas.

Tianshui is one of the earliest districts to start Distance Education in Gansu and now is the biggest district of Distance Education network. It started distance and information education in 2000. The district government raised funds in various ways, like applying for projects from the province and nation, seeking donations from people, increasing funds from the department adding education fees. By the end of 2005, there were 1596 schools with Model 1 classrooms, 1236 school with Model 2 classrooms and 179 schools with Model 3 classrooms in Tianshui. To make sure equipment was being used efficiently, Tianshui education bureau established a 'Three Put Into Place and One Improvement' policy. The Three Put Into Place is 1) equipment put into classroom, 2) teaching plan put into daily curriculum, and 3) user name put into record. The 'One improvement' is to improve teaching quality via Distance Education (Table 1).

**Table 1**  
**Distance Education in Dome Districts or Counties of Gansu Province**

District/County	Schools	Percentages to all school (%)	Input (RMB)	Reference
Tianshui	1596	95	45 000 000	Tianshui, 2004
Zhangye	778	100	2 660 000	Zhangye, 2005
Huining	567	100	20 000 000	Huining, 2005
Minqin	461	100	5 937 000	Minqin, 2005
Minle	197	100	4 065 000	Minle, 2005
Yongchang	143	100	3 000 000	Yongchang, 2005
Linze	95	100	16 060 000	Linze, 2005
Total	15 528	86	363 939 000	Gansu Daily, 2007

Linze is another pioneer to develop Distance Education in a whole county. It is the first county that established its own education website in Gansu Province. The local government funded 16 060 000 RMB from 1997 to 2004, which is 31% of Linze's GDP in 2004, the year they set up their own education website. 100% of the schools in Linze are now using Distance Education methods (Linze, 2005).

Teacher quality is one of the key factors determine the participation rates of children in schooling and the quality of their education. It is also an important element in remoting social justice in terms of educational quality in rural and remote areas, where teachers tend to be less qualified than their urban peers and not well resourced and supported. Implementation of Distance Education enables teacher training to be carried out on a large scale with high efficiency and quality. All teachers in primary and secondary school can receive training and further education, which can lead to a remarkable improvement of the overall quality of primary and secondary school teachers. Only EU-CHINA GBEP directly benefited 105,000 rural-area teachers and head-teachers and indirectly benefited 2.6 million students as they experienced improved teaching. This does not include students that experienced Distance Education directly (Robinson, 2008).



Huining is one of the poorest but also is one of high quality education counties in China. The Nine-Year Compulsory Education (NYCE) had been universalized in this county since 2004. Gansu province put more than 20 000 000 RMB to develop Distance Education in this county. By the year 2007, more than 12 000 teachers and 160 000 students had benefited from the policy. All primary and secondary schools in Huining county has been covered by Distance Education Network (Table 2).

**Table 2**  
**Students and Teachers Benefited from Distance Education**  
**in Some Rural Areas of Gansu Province**

District/County	Students	Teachers	Reference
Huining county	160 000	12 000	Huining, 2005
Minqin county	70 000	6400	Minqin, 2005
Ganzhou	22 000	2800	Ganzhou, 2005
Gangou (town)	530	26	Gangou,2005
Total	3 955 200	>105 000	Gansu Economic Daily, 2005; Robison, 2008

While Distance Education is a main platform for providing professional development for rural teachers, teachers should be trained, not only in professional techniques of teaching, but in how to use the equipment. In China, “daike” teachers (community appointed and paid) are not recognized by the government or eligible for inclusion in the professional development provision, even though they may be qualified and teaching in government schools (Robinson & Yi, 2008). Gansu Province averages more than 9.7% of “daike” teachers and in some areas more than half or even higher. The salaries of these teachers are very low, average between 300-500 RMB/month. Some are more than 50 years old with low education background sand they need work in farm as well. These teachers have less chance to be further educated and some of them are slow to adopt the new techniques in teaching though the established Distance Education system. Take Ganzhou as an example. 80% of the teachers can use the computer to give a lecture, only 40% of them can find and create educational resources to use in teaching, prepare lesson plans, and retrieve and store online information on the new curriculum and teaching methods (Table 3).

**Table 3**  
**Skills Mastered by Online Education Teachers in some Rural Areas of Gansu Province**

District/county	Basic mastered (%)	Practically mastered (%)	Students/ computer	Reference
Linze	100	90	13:1	MoE, 2005
Zhangye	90	65	15:1	Zhangye, 2005
Ganzhou	80	40	13:1	Ganzhou, 2005
Total	96	88	13:1	Gansu Daily, 2007

The NYCE and Distance Education program provide scholarship and other policies like “Two free and one allowance.” This means that students from a poor family do not need pay for tuition and book fees and can enjoy an allowance from the school. (Minle, 2005;Qinchen, 2005;

Tianshui, 2004;) In Minle, as an example, 8,583 students from poor families enjoyed the “Two free and one allowance” policy and the school itself has a related favorable policy for the rest of the students. Seven hundred and eighty one (781) students were released from 20 600 RMB fees in primary school and 346 students were freed about 25 100 RMB fees in secondary school in one term in 2005. The county also merged 49 schools, reestablished 8 new schools in other places, and established one lodging (boarding) school. These policies greatly encouraged students from poor families to go back to school and continue their studies. The quality of teaching was improved in all aspects. At the end of 2004, 77% of the students were qualified in the 6 subjects exam given to all senior students from secondary schools, and 86% of the students were enrolled in high school. Among primary school students, 98.7% passed the 2 subjects exam . Compared to the past, the qualified percentage for both primary and secondary school graduates were increased more than 20% in Minle and the whole province (Table 4).

**Table 4**  
**The teaching effect of Distance Education in part of rural areas of Gansu Province**

District/county	Graduated or qualified percentage (%)				Reference
	Past	present	past	present	
Tianshui	62	82	38	41	Tianshui, 2004
Qincheng	75	99	72	98.4	Qincheng, 2005
Minle	66	98.7	60	86.3	Minle, 2005
Total	60	98.3	56	88.3	Gansu Daily, 2007

### Prospect and challenges of Distance Education in Gansu

The use of Distance Education in rural areas has the potential to distribute learning more widely and equitably across the teaching force and student learners. It has already improved teaching quality, student enrollment, changed the mind of teachers, and widened the view of both of teachers and students. It has improved the variety of resources and support available to teachers, opening up new avenues to professional development.

The central government has put “revitalized China Through Science and Education” as a basic policy and put the status of education in rural areas as the “priority among priorities” .In 2003, 3.344 billion RMB was allocated to pilot the ‘National Modern Distance Education Program in Rural Areas’ . As a result, the pilot project, including 10,000 primary and secondary schools in western areas of Gansu has been completed successfully (MoE, 2004). The Gansu Province take Distance Education as a government mandate. In the 11<sup>th</sup> 5-years development policy, the government will provide more money to develop Distance Education, construct and enhance the infrastructure, and extend information technique courses and workshops. It will use primary and secondary schools to develop methods of instruction and rely on universities for information technique construction and integration of all educational resources. This will be under leadership of the Education Technology Center in Gansu Province.

Though Distance Education has been successfully established in Gansu Province and achieved improvement in teaching quality and social impact, it still has a long way to go to keep up with developed areas and other countries. The rural Distance Education programs of Gansu should ‘consolidate existing achievements, deepen reform, improve quality, and pursue a sustainable development’ policy. To consolidate existing achievements, the Province government should sustain funding to maintain the system and ensure that it runs smoothly in technique and equipment.

Take Gaoling of Kongtong primary school, Pingliang District as an example. The school established a Model 1 and Model 2 classroom in Oct. 2004, but few of the teachers can use it. Some of the teachers don't know how to operate the equipment. As a result, they delete important information and the computer can not run any more. Some schools in this district are too poor to use these equipments. Pankou, Huasuo primary school, with only 37 students, has 300 RMB for daily teaching and to maintain the Distance Education equipment (Zeng, 2005).

The Province government should insist on continuing the development of Distance Education in rural areas. It should learn from other places, introduce new methods and resources to improve teaching quality, and shorten the education gap with developed districts to facilitate development of the local economy. The government needs programs to change teachers' minds and teaching methods through workshops and practice courses; to have teachers view and emulate other teachers courses, and meanwhile enhance teacher training on how to use the equipment in various ways. To sustain development of rural Distance Education, the Province government should not only fund the education system, but should encourage teachers create their own teaching materials, communicate about teaching methods, share experiences, participate in teaching competitions, and apply "best practices.". The resources of rural Distance Education must have diversity. Resources developed by the national must suit local requirements, and have different models to support different bases in different place. And third, the government should continue funding to ensure that the school can maintain and run the equipment smoothly.

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**Editor's Note:** For the distance educator, this paper is a joyful and rewarding experience – a seemingly improbable success story about a mathematics professor who teaches his first online course. The editors feel that, while online technology, properly used, is wonderfully supportive of learning, Dr. Rochowicz has demonstrated unusual skill and insight in integrating technology and pedagogy to create a successful online course in mathematics.

## A Distance Learning Experience in a Quantitative Methods MBA Course

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### Abstract

Teaching a course on the Internet is a unique and innovative experience for the professor as well as the student. This paper describes some personal experiences and thoughts on the teaching of statistics on the Internet for an executive MBA statistics course. Choosing learning materials such as textbook and software are discussed. Decisions as to what and how topics would be covered are presented. Assessing student learning and reflecting on what was learned in the teaching of such a course are also described. A comparison is made between a traditionally taught course and an online course. Advantages as well as disadvantages on teaching statistics in a distance learning environment are described. Teaching and learning statistics online is a very different experience.

**Keywords:** Spreadsheets, EXCEL spreadsheets, Statistics, Executive MBA degree, MBA degree, Distance Learning, WebCT environment, online learning, mathematics on the Web, statistics on the Web, and Quantitative Methods.

### Introduction

Statistics is a difficult course of study for many students. The material is very technical and process oriented. In order to be successful, the student must be motivated and interested in the material to be learned. The manner in which topics, materials and software are chosen for an online course is more difficult than introducing statistics in the traditional lecture computer lab format. A class taught on the Web entitled: *Statistical Analysis: Quantitative Methods* is described. Since no class meetings were face-to-face presenting the material in the clearest and most relevant manner had to be made possible. Teaching statistics on the Web involves an entirely new and different way of presenting concepts. Teaching in a Web environment also raises concerns. These include: a) how does the educator assess student learning? b) How do students demonstrate that they have learned the material?

### The Course

After searching many sources and resources and considering many options in preparation for a course where professor and students were not face to face, a unique method of presenting content was determined. The approach taken focused student learning on details and practice in which the student selects the correct techniques, performs a statistical analysis with appropriate technology and communicates an interpretation of the analysis. Through this approach, emphasis is placed on the choice of the correct analysis and then writing in narrative form clear and appropriate results and findings.

The “class meetings” were online weekly meetings for about 3 to almost 4 hours. Discussion occurred in a WebCT chat room. Assignments were collected by email. Instructor results and comments were emailed back to students for learning reinforcement. Results were emailed to students promptly, usually by the next online session. “Office hours” were Sunday evenings for

about 2 to 3 hours. The course ran for 6 weeks. The notion that using the Web allows learning and teaching to occur anytime and anyplace was a new experience for the instructor.

### **Course Content**

The concepts for the course covered a variety of topics from descriptive statistics to advanced inferential statistics. Detailed written notes were developed by the instructor and placed in WebCT. WebCT is an environment for online student-professor interaction and course of study. Instructions were also provided on how to use EXCEL for data analysis as well as how to do statistics with EXCEL. Emphasis was placed on interpretation and analysis of results. Each student was also required to provide a written report of the use of such data analysis for their work in healthcare. The course material was broken into 6 parts or sections. The parts included: a) Part I: Introduction, Descriptive Statistics, Probability and Probability Distributions; b) Part 2: Sampling Distributions, Estimation, Inferential Statistics, Confidence Intervals, and Introduction to Tests of Hypothesis; c) Part 3: More Tests of Hypothesis, Chi-Square Tests of Hypothesis and F Tests of Hypothesis (ANOVA's); d) Part 4: Regression Analysis-Linear and Multiple Regression; e) Part 5: Time-Series Analysis, Forecasting, and Index Numbers; f) Part 6: Process Control, Decision Theory, and Game Theory. EXCEL, spreadsheet software, was used for each analysis and was available to the student.

The amount of material we covered in 6 weeks was beyond my and most student expectations. Assessing student learning was based on numerous data analyses conducted using EXCEL. Also 2 case studies were assigned and reviewed. Student analyses were submitted by email with a detailed written description of results. Another requirement for assessment was that each student describes his or her own examples of how the techniques learned would be used in their practice or healthcare business. Various exciting, interesting, and detailed reports were received. For example, one physician used statistical methods he learned to discuss quality control with customer satisfaction surveys in very clear and explicit details. Another example from a physician illustrated how horseback riding was therapeutic for children with various disabilities

### **The Textbook**

The textbook used for this course was *Statistics for Management and Economics* by Gerald Keller (6th edition or 7<sup>th</sup> edition). Data was available in raw untreated form for numerous examples. Students did not have to enter data. The data was available on a disk that came with the textbook. Learning how to use technology was emphasized. Details were shown on how to: a) calculate in the traditional sense of using formulas; b) use EXCEL; and c) use Minitab. One of the biggest benefits of this book was the detailed descriptions presented on how to do statistics with EXCEL and Minitab. Every statistics topic possible was thoroughly covered. The use of tedious calculations was eliminated. Emphasis was placed on technique and communications of results. Typical topics included a) Descriptive statistics b) Hypothesis tests and inferential statistics for means, proportions and the differences between 2 or more that 2 means proportions, c) Regression and Correlation, d) Time Series and e) Decisions Analysis.

Numerous students encounter difficulties in deciding which statistical analysis is appropriate for a specific situation. Detailed summaries and examples throughout the course were provided by Keller and the instructor that helped students decide on the choice of the correct analysis.

### **The Software**

EXCEL was chosen because it is typically used in most if not all business courses on quantitative analysis and methods. EXCEL is also a great tool to learn for any business applications outside of the academic environment. Keller's text had integrated EXCEL into the statistics concepts exceptionally well. The datasets used in this textbook by the way were available in other formats including ASCII and SPSS. In order to install the EXCEL components for this course, all one had to do was use a) data analysis ToolPak (available in EXCEL) and b) an add-in that came with the

textbook. EXCEL is very easy to use and the author provided detailed examples on how to use EXCEL to do statistical analysis. Also the learning of EXCEL did not interfere with learning statistics as some other types of software might. Students that had no background knowledge about spreadsheets were learning how to use spreadsheets as well as quantitative methods for pursuing research in an MBA curriculum.

### **The Students**

Typical students taking this course were physicians or healthcare members of the Pennsylvania Medical Society. All of them were pursuing an executive MBA degree for physicians. The experiences discussed are from two classes. These classes ran in spring 2003 (January and February, 2003) and in spring 2006 (February and March 2006). The first class had 18 students while the second class was comprised of 13 students with various undergraduate degrees.

Since the instructor had no idea whom he was teaching, he thought there would be difficulty conveying topics to learners without showing detailed calculations and concepts. This was not the case for this course. An online discussion “class” session was started by asking questions regarding statistical examples and concepts supplied in WEBCT. In a short time almost everyone was discussing solutions to these specific examples. More discussion and interaction was involved than the instructor had ever gotten from students in a traditional classroom. Students were found to be highly interactive, automatically doing the statistical analysis for each example. Students were learning statistics as well as EXCEL. Results were accurate and the interpretation of results was correct. The motivation was exceptional. Some students were actually using two computers, one for online communication and the other one for doing analyses with EXCEL.

### **Results of the Experience and Student Feedback**

Every student that participated in the feedback survey indicated the value of this course to their career or the business aspects of their practice. Students that could not be available for these online “class” meetings had access to a transcript of the evening session. So notes and assignments were always available for students. The ability of studying on their time was noted as an advantage. The ways in which the discussions were presented and the material was described by the instructor were also noted as helpful and exceptional. Students also enjoyed the thoroughness in the way the author of the textbook clearly described how to choose the correct analysis and techniques for specific cases. Chi-square analyses, regression analyses, quality control charts and a variety of other techniques were easily understood through many examples. The packet of notes, examples, and assignments in WEBCT supplied by the instructor, were noted as very beneficial in the reinforcement of selecting appropriate analyses for each situation. The ease in using EXCEL to do statistics was also noted as a great aid in making learning effective. A few students even provided positive comments on the amount of material discussed in this course.

### **Reflections on a Distance Learning course in Statistics**

Students were more involved in learning the material than in a traditional classroom situation. Almost everyone participated on the online discussions that occurred every week. Various advantages of studying online were found. Many commented that they could study at their own pace. The course was more interactive than instructor or the class imagined. Students worked out numerous examples with EXCEL as quickly as they asked questions. Clearly, technology frees the student from tedious calculations. Interpretation and correct data analysis were emphasized. The use of formulas and calculations were reduced and almost eliminated.

There are also some disadvantages in teaching an online course. The emotions of the student-teacher interactions such as facial and body expressions are not seen. Automatic reinforcement is

not available. Group discussions become complex and chaotic. Collecting assignments and grading them on an appropriate level is difficult. Students can cheat more easily. Everyone must have software that works. One of the difficulties at the beginning of this course was to have all students accessible to EXCEL. In addition students had to know how to use the computer.

Both course experiences were very good to exceptional as indicated from the student feedback surveys. At times, students became so involved in doing the examples provided that the instructor could not keep track of all their discussions. Tracking students who were involved in the online discussion was difficult. Many students were involved in the classroom discussions at the same time. As revisions are made and the results of these 2 courses are considered, additional topics such as advanced multiple regression and post hoc analyses could also be added.

### **The MBA Capstone Experience**

Students were required to synthesize their learning by presenting a research topic of their choice in a capstone experience. The instructor attended two of these sessions 2003 and 2007. In either case mention was made that using statistics in their research was invaluable and our quantitative methods course was a benefit. Also, the instructor finally met these students face to face. The professor already knew them virtually. It was a different experience to meet them in person.

### **Conclusion**

The professor learned that a challenging academic level MBA course can be presented on the WEB. There was concern that teaching statistics online would lose some of the traditional “rigor” associated with it. The instructor was wrong. Through these classes, it was found that technology frees students from unnecessary calculations and focus can be placed on concepts and techniques. An observation made by the instructor was that technology motivates students with the capability of studying many topics not usually studied in a traditional way. With student motivation high and working technology, learning becomes fun and invaluable. Students learned quantitative methods that they could use for many business aspects of their medical practices. Learning becomes student focused and relevant. Many students also indicated that they thought the course was valuable to them. The instructor found that developing topics for the WebCT environment and using EXCEL for the data analyses to be challenging but well worth the time and effort.

Students in this online course were exceptionally motivated and may not be typical but the discussion presented here concerning the materials, the way in which topics were studied and the student-teacher interactions show that a statistics course can be studied online and with surprising results.

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## About the Author

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**Editor's Note:** Learning in global interactive environments is stimulated by use of computer networks. For Asian students, this requires additional skills in English and in Information and Communication Technologies (ICT). These, and other skills that facilitate or inhibit learning, are the focus of this paper.

## Factors Influencing the Participation and Perceptions of Asian K-12 Students in Global Networked Learning

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### Abstract

Strengthening Information and Communication Technology (ICT) skills and English capability through networked learning environments have proved to be an effective way to motivate Asian students' learning interest and participation. The APEC (Asia Pacific Economic Corporations) Cyber Academy is a free networked learning environment that aims at ICT skill improvement, international collaboration, and project-based learning. This study explores Asian student and teacher perceptions toward networked learning. This paper further analyzes factors that contribute to or inhibit active participation of networked learning. Teachers who facilitate the process also affirm the pedagogical values of collaboration, peer evaluation, and ICT skill improvements. Both teachers and students acknowledge the importance of teamwork and community of practice in networked learning.

**Keywords:** ICT skills, Project-based Learning, Networked Learning Environment, International Collaboration, English Learning, Learning Community

### Introduction

Infusing Information and Communication Technologies (ICT) in the K-12 classrooms has become increasingly important for K-12 educators. ICT skills play an important role in student academic achievements and social skills attainment. With a wealth of information available only online, students need to know how to access, search, retrieve, analyze, synthesize, and evaluate information (Serim, 2002). Learners also need to be equipped with the communication skills to face an increasingly challenging global marketplace. In many Asian countries, mastering ICT skills as well as English also provide a gateway to global citizenship.

This study will explore factors that attract students in Asia to join global online learning activities. The APEC (Asia Pacific Economic Corporations<sup>1</sup>) Cyber Academy (hereafter ACA) is a free networked learning environment that was created to enhance ICT skills, English, team collaboration, and international contact. Annual international online learning events were held in ACA with around 1,000 K-12 students participating in a series of activities that promote cross-cultural understanding and international collaboration. The objectives of this study are to examine Asian student and teacher perceptions of networked learning environment and factors that may influence students' willingness to participate in online activities.

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<sup>1</sup> The 21 APEC member economies include Australia, Brunei Darussalam, Canada, Chile, People's Republic of China, Hong Kong, China, Indonesia, Japan, Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Chinese Taipei, Thailand, United States, and Vietnam

## Theoretical Framework

Information literacy has become part of regular K-12 curriculum in many parts of the world. New hardware and software development have also contributed to the changing pedagogy in the classroom. McKenna (2006) postulated three trends of software development that have profound impact in literacy education. The three trends are advancement in speech recognition software, computer-assisted reading support for struggling young learners, and an increasingly sophisticated multimedia environment (including games). The development in these three areas is especially beneficial for ESL learners in Asia. ESL students could have more opportunities to polish their language skills through speech recognition, reading-assistant and multimedia. Teachers and students are increasingly utilizing information and communication technologies to enhance the learning and teaching activities. ICT has great potential to increase student engagement in learning activities. ICT also provides innovative pedagogy that goes beyond drill and practice.

Studies have suggested a wide range of factors that influence student participation in web-based activities. Interface design (Ge, et al., 2000), social cues and interaction, (Fisher, et al., 2000), and psychological factors such as trusting the medium, teachers, and peers (Huges, et al., 2002) can all contribute to student participation. Cramphorn (2004) summarized four main factors that influence student participation: psychological barriers, lack of social cues, timescales, and constructivism. Psychological barriers refer to the feeling of being an outsider and a lack of confidence in posting to public forums. The lack of social cues makes it difficult to establish rapport with peers in web-based discussion. The frequent use of emoticons or abbreviations may enhance or hinder understanding depending on the cultural background of the participants. Time is also another factor that may hinder participation. For instance, the lack of synchronicity between messages and replies in discussing forums could cause anxiety in some participants. Furthermore, the time it takes to provide good writing and responses could put pressure on some participants too, not to mention the time needed on preparing artifacts and engaging in collaborative activities. Finally a web environment that encourages constructivist approach of learning may widen the gap between the weak and the strong students at the initial stage. The constructivist approach encourages critical thinking and democratic participation. The weaker students may find it intimidating to post their views in the discussion board. The feedback from facilitators should be more encouraging to build confidence in participants and bridge the gap. In short, student participation in web-based learning activities could be enhanced using multiple aspects of design including interface, instructional activity, motivation, and philosophical underpinnings.

ACA is steeped in constructivist and self-regulated learning theories. Learner-centered pedagogy is especially the essence in the design of networked learning activities in ACA. It is expected that students become autonomous learners through collaboration, peer evaluation, and project-based learning (PBL). PBL, which is the core in ACA, provides authentic learning experience that has real-world applications to students (Moursund, 2003; Thomas, 2000). The tools and various ACA components were designed to facilitate teaching and learning activities with sound pedagogy and friendly human-computer interface (HCI). The technologies employed include intelligent agent, video conferencing, forum, mailbox, text chat, speech recognition, 3D virtual learning worlds, student project showcase gallery, and tracking system for learning progress. These tools are designed to support scaffolding, social construction of knowledge, online collaboration and project-based learning (Authors, 2007).

## Background of APEC Cyber Academy

The APEC Cyber Academy (<http://linc.hinet.net/apec>) is under the auspices of the Asia Pacific Economic Corporations (APEC) and the Ministry of Education of Taiwan. Students from the

twenty-one political economies of APEC are strongly encouraged to utilize the ACA platform to improve their ICT skills as well as English capability. Annual international online learning events are held every year for K-12 students and teachers from the APEC member economies to engage in a series of structured activities for the purpose of ICT skill enhancement and English learning. More than 10,000 users have registered in ACA since its inception in 2002.

There are two main ACA programs in the annual international online learning events: ICT Cyber Camp and Networked Collaborative Learning Program (NCLP). The learning modules of each program are summarized in tables 1 & 2.

**Table 1**

**Integration of Pedagogy and HCI in the ICT Cyber Camp Learning Modules**

<b>ICT CyberCamp Modules</b>	<b>Pedagogy</b>	<b>HCI</b>
APEC Traveler	Interactive games to understand the country names, food, currency, scenery, and national flags	Direct manipulation with arrow keys and mouse clicks, avatar for representation
APEC Challenger	Co-construction of knowledge and competition on quizzes	Agent base multimedia games
Magic House	Language comprehension in listening and speaking	Text-to-Speech and Speech-to-Text technologies
iHunter	Project-based learning	Student produced video presentation
Story Time	Round-robin activity, Collaborative story-telling	Blog-type digital story telling
Icebreaker	Community building, Virtual museum	3D virtual learning worlds
eLibrary	Teacher support and online learning resources sharing (refine search skills)	Repository of Learning Materials
Campfire Party	Capstone activity, Summarization of the program	Student-produced video presentation

**Table 2**

**Project-based Learning in the Networked Collaborative Learning Program**

<b>Networked Collaborative Learning Program</b>	<b>Objectives</b>
Convenience store	Understand the cultural differences of convenience stores in different countries and currency conversion
Our holidays	Compare and contrast holidays in different countries though cross-group collaboration
Money	Understand the monetary systems and discuss the value of money in APEC member economies
A day in our school	Enrich cultural diversity through the exchange of schooling experience in different countries

Both programs have strong emphases on project-based and problem-based learning. Teachers and students can form teams to participate in either the ICT Cyber Camp or one of the four projects in NCLP during the ACA annual international online learning events. During the nine weeks of the annual learning events, each team will present ICT artifacts based on the theme and requirement of each program. Online tutors are also available to provide assistance to participants in each project area. The assistance includes English correction, project comments, and technical troubleshooting.

## Methodology

ACA has held four international online learning events since 2002. The ICT Cyber Camp activities were not available in 2002 and 2003. The retention rate of the annual learning events varies every year as indicated in Table 3. In 2005, 37 teams (46%) completed all tasks in NCLP and 30% completed the ICT Cyber Camp activities. Since retention rate is one of the most significant indicators about the quality of the service in networked or distance learning (Axmann, 2007), it is important to find out what elements of the ACA learning environment or services contribute to or impede student participation in the perspectives of Asian students and teachers.

**Table 3**  
**ACA Project Retention Rate**

Years	Number of ICT Teams			Number of NCLP Teams		
	Registered	Completed	Rate	Registered	Completed	Rate
2002	N/A			82	56	68%
2003	N/A			63	38	60%
2004	28	0	0%	65	23	35%
2005	20	6	30%	80	37	46%

This study employed two surveys (Appendices I & II) that include both quantitative and qualitative data. Surveys for the teachers and students were designed to examine the perceptions of the ACA participants. The teacher survey consists of ten 5-point Likert scale questions, one multiple choice question, and two open-ended questions. The student survey, including questions on learner attitudes toward the ACA learning activities and the learning environment, has twenty-four 5-point Likert scale questions, one multiple choice question, and two open-ended questions. The student survey was adopted from the Young Children's Computer Inventory (YCCI) by Miyashita & Knezek (1992). The YCCI was tested with Japanese, Mexican, and American students with high validity and reliability. The original survey has examined children's attitudes in the following six areas: computer importance, computer enjoyment, motivation/persistence, study habits, empathy, and creative tendencies. The student survey for this study was developed with questions that focus on computer importance, enjoyment, and other specific ACA areas. The reliability of the surveys is measured by Cronbach's alpha. The results show high reliability of the survey instruments (student survey = .880; teacher survey = .969). The comments for the open-ended questions were analyzed with NVivo (QSR, 2006), a qualitative research software program. The first researcher for this study was an observer of the ACA programs who didn't participate in the actual project management or operation. The second author of this study is the project director who has designed and conducted the ACA programs since 2002.

An announcement of the surveys was posted at the ACA web site at the end of the 2005 annual international contest. Ninety-six students and fifteen teachers who participated in the 2005 learning events completed the online survey. The nationalities of respondents of the survey include Taiwan, Korea, and Thailand. The grades range is from 5<sup>th</sup> grade to 12<sup>th</sup> grade. The survey was provided in both Chinese and English. The objectives of the survey are:

1. What are the student perceptions toward ACA and ICT in general?
2. What are teacher perceptions toward ACA learning programs?
3. What are the factors that may contribute to or inhibit the learner participation of ACA activities? In other words, what are the elements in ACA that might have contributed to the low retention rate in the annual learning events?

## V. Data Analysis

### 1. *Student perceptions toward ACA and ICT:*

According to the student survey (Appendix I), many students strongly agreed that they enjoy working with a computer (84%), playing computer games (77%), learning with a computer (84%), and collaborating with teammates (81%). In addition, the majority also agreed that they enjoyed writing in English (65%), chatting online (56%), using the computer (60%), navigating easily in ACA (59%), using critical thinking skills for ACA activities (54%), having fun with ACA activities (65%), feeling rewarded from ACA activities (65%), communicating with other ACA students (51%), logging onto ACA to review projects (66%), and becoming more interested in communication in English (63%).

When asked to choose the top three favorite ACA activities, the following six items have a higher rating: showcase (60.45%), playground (53.13%), video chat (39.58%), forum (38.54%), mailbox (37.5%), and online tutors (35.42%). Showcase is the place where student artifacts are exhibited and peer-evaluation is employed. The data indicate that students enjoyed browsing each other's projects through the showcase tool. They definitely enjoyed playing games at the play ground. They were also constantly seeking ways to reach out to each other via synchronous and asynchronous communication tools.

### 2. *Teacher perceptions toward ACA learning programs:*

More than half of the teacher respondents agreed that ACA interface is easy to navigate (57%), students enjoyed the ACA games (60%), and the activities could encourage student collaboration (74%) and increase ICT (75%) and English communication skills (73%). The respondents have also pointed out that ACA activities require more time (60%) and much assistance from the teachers (67%). The data collected from the open-ended questions are summarized in table 4.

**Table 4**  
**Comparison of Student and Teacher Responses**  
**on Benefits of ACA Programs**

Themes	Students	Teachers
Fun	8	0
Peer evaluation	3	2
English improvement	14	9
Sense of community	13	3
Collaboration	0	7
Improved ICT skills	2	7
ACA environment	5	1
Subject matter	11	3

### 3. *Qualitative data analysis*

Open-ended questions on the benefits, challenges of ACA activities and suggestion for ACA were included in the surveys. The data reveal new perceptions toward ACA activities that are not covered by the Likert scale questions. Using the NVivo program, the following themes have emerged in terms of benefits and challenges of the ACA programs. Table 4 shows a comparison of the number of responses by students and teachers at each theme on the benefits of ACA programs.

Both the teacher and student responses on the benefits of the ACA activities reveal that English improvement is the primary factor that attracts them to the ACA programs. Students need to use English to communication with peers and develop projects. They are presented with many opportunities to practice English. The second most cited benefit by the students is the sense of community. They have a chance to communicate with students from different cultures and collaborate with peers in the online community. Online tutors are also available to talk with students. Students have also reflected that they enjoyed posting and checking messages at the forum. Student comments included: "it's interesting to chat with people from different countries," "I have made more friends," "The ACA participants were helpful in responding to questions." Many students have also reported increased knowledge about the subject matter and the fun nature of the ACA learning programs.

English improvement in the students is also the most obvious benefit that is observed by many teachers. In addition, teachers also make note on the improvement of collaboration and ICT skills through the ACA learning programs. Teachers placed more emphasis on the pedagogical benefits of networked learning.

Interestingly, no students have commented on collaboration with teammates whereas the teachers have regarded collaboration as one of the benefits. Most of student responses to the open-ended questions were short sentences (one or two sentences). Their limited English skills could be one reason. Nevertheless, 80% of the students did respond favorably on the merits of collaboration in the Likert-question in the survey.

**Table 5**  
**Comparison of Student and Teacher Responses**  
**on Challenges of ACA Programs**

Themes	Students	Teachers
Insufficient time	8	11
Network traffic	1	4
PBL-new learning mode	0	2
ACA bugs	1	2
ICT skills	0	4
Collaboration	0	2

Table 5 summarizes the challenges indicated by students and teachers pertaining to the ACA annual international online learning events. Since all activities were facilitated by teachers in the learning events, most of the challenges were resolved by the teachers who had reported the difficulties in participating in the ACA learning events. Insufficient time was cited as the top challenge for both teachers and students. Teachers had mentioned that all projects needed to be completed in the computer lab. They had to make arrangements to use the lab, teach students how to create web pages and process digital media, monitor student progress in



addition to implementing regular curriculum, and meet project timeline. All these factors make it very challenging to complete all activities within nine weeks. Furthermore, most students accessed the ACA site during lunch hours or after school hours, which slowed down the server when hundreds of students were online at the same time. Worth noting is the challenge in implementing project-based learning strategy. Many students in Asia are used to traditional lectures and teacher-centered activities. A few teachers had indicated that the students did not have the motivation to get projects started on their own at the initial stage. The students wanted to be told what to do. They needed very specific guidance for each step. It took a while for students to become somewhat autonomous in project completion. Furthermore, most ACA activities were conducted as part of the after-school program which was not tied to the formal curriculum. Students' performance was not part of their grades which might explain why some students were not interested in completing or working on the projects. Students did not approach the challenges with the same intensity as the teachers since they could always turn to the teachers for help.

#### 4. *Factors influencing participation:*

Based on results of the surveys, quantitatively and qualitatively, ACA participants have shown strong interest and been motivated to participate in the ACA activities. Factors that positively influence the participation of Asian students in the ACA learning programs are summarized as follows:

- **Sense of community:** Students enjoy interacting with each other and the online facilitators. The majority indicated that they enjoy online chatting and visit ACA learning environment to review different projects. Although most of the students are not confident with their English capability, the built-in social tools in ACA such as showcase (for peer project evaluation), forum, and mailbox are all highly utilized by the students. The combined activities provide a sense of community supported by a learning environment that is highly interactive.
- **Computer importance and enjoyment:** A high number of respondents agreed that computers could assist them in gaining new knowledge. It is important to be good at using a computer. Students who are not motivated to use computers may not find the ACA projects interesting or have the desire to complete projects.
- **English improvement through real-world content learning:** Students work on projects that have real-world application in English. They also interact with other participants in English. Both teachers and students indicated improvement in English. It is important for the Asian learners to find a venue in which that they can practice English in a real-world scenario with native speakers and work on projects that further their understanding of physical and virtual learning environments. For example, they have to present school schedules, interview convenience store clerks, check out prices for various products, and compare holidays around the world. Through the knowledge construction process, they have improved understanding of the world around them and the English language.

The surveys, nonetheless, also have revealed several elements of the programs that prohibited the participation: insufficient time of engagement, lack of curriculum integration, and unsatisfactory online learning facilitation.

## **Conclusion**

The main goal of ACA is to enhance ICT skills and English capability through project-based learning and collaboration in a networked learning environment that encourages international collaboration and intercultural exchanges. ACA has accomplished the main goal as most

participants have indicated enhanced ICT skills and a strong desire to communicate with peers in English. In addition, students have also demonstrated a strong interest in computers, international collaboration, online community, interactive human-computer interface, fun activities and games, and human feedback. Having fun, establishing new friendships, and learning something meaningful are also revealed in their choice of the favorite ACA learning activities.

Teachers are the team leaders of the ACA annual international learning events and their participation is equally important. Most teachers have acknowledged the increased ICT skills in students as a result of participating in the ACA projects. To encourage more active participation of the teachers, it is important to integrate ACA activities into K-12 curriculum, allow more flexibility in project completion, maintain a robust system, reduce network bottleneck, and increase participating countries.

This study has profiled several key elements that attract Asian K-12 student participation in networked learning. The use of games and interactive tasks to engage students in active learning is essential. Further research on what students do online and how to keep them engaged while learning content knowledge should be implemented. As more teachers are integrating more ICT skills into the classroom, it is imperative to understand what motivates or discourages students in networked learning. Although the findings from this study provide a unique angle on Asian students and their perceptions toward computer and learning, some of the perceptions are applicable to today's K-12 learners in general.

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## Appendix I

### ACA ONLINE SURVEY FOR PARTICIPANTS (STUDENTS)

**Dear APEC Cyber Academy Participant:**

Thank you for attending the APEC Cyber Academy (ACA) annual contest. We would like to have your feedback on the activity design for future improvement. Please complete this short survey by indicating your agreement on a 1 to 5 scale, 1 as strongly disagree and 5 as strongly agree. If you have not used a particular feature mentioned in the question, please check N.A. (not applicable)

**Sincerely,**

**ACA Project Team**

1 = Strongly Disagree; 2 = Disagree; 3 = Slightly Agree; 4 = Agree; 5 = Strongly Agree; and N.A. = Not Applicable

Questions	5	4	3	2	1	NA
1. I enjoy writing in English.						
2. I feel nervous communicating in English with other students.						
3. I enjoy online chatting.						
4. I enjoy doing things on a computer.						
5. I am tired of using a computer.						
6. I enjoy computer games very much.						
7. I can learn many things when I use a computer.						
8. I can navigate in ACA easily.						
9. The graphic design of ACA is pleasing.						
10. The ACA activities have challenged me to think critically.						
11. The ACA activities are fun to participate.						
12. I find the ACA learning experience rewarding.						
13. I have gained new computer knowledge and skills through ACA learning activities.						
14. I have met new friends through ACA.						

15. I enjoyed video-conferencing in ACA.																		
16. The Online facilitators were helpful in answering questions.																		
17. When I ask questions, the online facilitators give me the answers I need.																		
18. When I ask questions, I find help from other ACA participants.																		
19. I collaborated with my teammates on projects.																		
20. I found it difficult to complete the activities.																		
21. I could use more time to complete the projects.																		
22. I enjoy communicating with other students in ACA.																		
23. I enjoyed logging onto ACA to review the projects done by other teams.																		
24. I have become more interested in communicating in English as a result of ACA learning events.																		
25. My top three choices of ACA activities or games are:																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">(1) Online Tutor</td> <td style="padding: 5px;">(2) Video Chat</td> <td style="padding: 5px;">(3) Forum</td> <td style="padding: 5px;">(4) X-file</td> </tr> <tr> <td style="padding: 5px;">(5) Gallery</td> <td style="padding: 5px;">(6) Play Ground</td> <td style="padding: 5px;">(7) Showcase</td> <td style="padding: 5px;">(8) Mailbox</td> </tr> <tr> <td colspan="4" style="padding: 5px;">(9) Learning Companion: WuKong</td> </tr> </table>							(1) Online Tutor	(2) Video Chat	(3) Forum	(4) X-file	(5) Gallery	(6) Play Ground	(7) Showcase	(8) Mailbox	(9) Learning Companion: WuKong			
(1) Online Tutor	(2) Video Chat	(3) Forum	(4) X-file															
(5) Gallery	(6) Play Ground	(7) Showcase	(8) Mailbox															
(9) Learning Companion: WuKong																		
26. Other comments																		

## Appendix II

## ACA Online Survey for Participants (Teachers)

Dear Teachers,

Thank you for leading the student team(s) to participate in the APEC Cyber Academy annual contest. Your feedback on the design of the activities and the web site is highly appreciated. Please complete this short survey by indicating your agreement on a 1 to 5 scale, 1 as strongly disagree and 5 as strongly agree. If you have not used a particular feature mentioned in the question, please check N.A. (not applicable)

Sincerely,

ACA Project Team

Questions	5	4	3	2	1	NA
1. I find it easy to tie the ACA activities to the school curriculum.						
2. I could use more time for the students to complete the projects.						
3. The ACA web site is easy to navigate.						
4. The ACA programs schedule sets the appropriate pace to complete the tasks.						
5. My students enjoy playing the ACA computer games.						
6. The computer skills required to complete the tasks are at the proper level of difficulty.						
7. My students required a lot of assistance in completing the tasks.						
8. My students collaborated on projects to complete the ACA leaning events.						
9. The ACA activities can enhance student interest in communicating in English.						
10. The ACA activities can enhance student interests in learning Information and Communication Technologies (ICT).						
11. My top three choices of ACA activities or games are: (1) Online Tutor           (2) Video Chat           (3) Forum           (4) X-file (5) Gallery                 (6) Play Ground         (7) Showcase         (8) Mailbox (9) Learning Companion: WuKong						
12. What are the benefits for your students in participating in the ACA contest?						
13. What are the challenges that you have faced while leading the team(s) to participate in the ACA contest?						
14. Other suggestion or comments for activities and functions of the ACA learning environment:						
15. Other comments:						

**Editor's Note:** This study from Jordan resolves a number of issues about test delivery and test performance, and poses questions for future research. Some subtle way to "observe" unproctored students might help to explain differences in results. The age factor also deserves additional investigation.

## The Relationship Between Performance Levels and Test Delivery Methods

Patricia Royal, Paul Bell

USA

### Abstract

The purpose of this research study was to determine if a relationship exists between test performance and test delivery methods, particularly for those taking proctored versus unproctored online exams. Participants in the study were a cohort of undergraduate students enrolled in two on-campus sections and one distance learning session of an undergraduate applied medical sciences course. Students in all three sections had the same instructor, read the same textbook, had access to the same course content via the same web-based learning platform and had access to video recordings of weekly on campus learning sessions. Students from all three course sessions were randomly divided into two groups. One group completed their exams via web-based delivery with supervision, while the other half completed exams via web-based delivery without supervision. A comparison of scores was analyzed to assess if a difference in performance level exists. Although the average test score across the four exams was consistently higher for the un-proctored group compared to the proctored group, this difference was only statistically significant for the first two exams.

**Keywords:** proctored versus un-proctored testing, test delivery, web-based testing, supervised testing, unsupervised testing, asynchronous web-based learning, online testing, test delivery methods, learning or online learning, online assessment, on campus learning, distance learning.

### Test Delivery Methods

#### Purpose

The current research was conducted in order to determine whether there is a relationship between student test performance and method of test delivery. With the increase in distance education, there have been many studies that have looked at the influence of learning medias on student performance, with the results having mixed reviews (Steinweg, Davis, & Thomson, 2005; Ragan, & Kleoppel, 2004; Thirunarayanan & Perez-Prado, 2001-2002). However, there has been little research that has investigated the influence of the testing format on student performance, specifically research addressing the effect of proctored versus un-proctored exams.

#### Introduction

With the rise in distance education courses, computer-aided exams have become commonplace for most faculty and students. Students who enroll in the distance education courses do so with the understanding that they will spend most of their free time in front of the computer and that exams will usually be taken via computers. Additionally many faculty members who are teaching campus courses also employ the aid of the computer for testing. The course material may be covered in class via lectures; however, the testing may be completed using computer-aided technology. There are various reasons for using online testing including automated grading, less time administering the exam, instant feedback for students, and flexibility for students to take the exam when prepared (Turner, 2005; Warren & Holloman, 2005; Wellman & Marcinkiewicz, 2004; Greenberg, 1998;) However, along with the advantages come some concerns regarding

academic honesty, accessibility, student learning styles, limited computer skills and use of supporting software, and student motivation (Turner, 2005; Summers, Waigandt and Whittaker, 2005; Lorenzetti, 2006).

A vast number of research studies have been completed to compare distance education courses and campus courses, and to establish if there are differences in student learning outcomes. Research conducted by Reason, Valadares, and Slavkin (2005), compared three delivery formats: traditional campus courses, hybrid courses, and internet-based courses. Student outcomes were measured by course participation, final course grade, and interaction with website. The courses researched were Educational Psychology and Health Care Delivery Systems, and the software used to support the internet-based course was Blackboard. The results indicated that there were no significant differences between the courses as far as the rate of student participation. However, students in the internet web-based course medium performed better than their counterparts in hybrid and campus-based settings. The researchers explain that this may have occurred because the internet-based students interacted more frequently with their learning medium compared to the learners in the other learning formats.

Ragan and Kleoppel (2004) compared distance-based students with in-residence students by using academic outcomes as a form of measurement. Both groups of students were in the Pharm.D. programs in the Kansas School of Pharmacy. They also used Blackboard as the software to support the distance-based program. Consistent with the previously mentioned study, the results indicated that the distance-based students slightly outscored the in-residence students when comparing exam scores, which is consistent with the previously mentioned study. Ragan and Kleoppel do note that a limitation of the study was no measurement of incoming skills and knowledge was identified prior to the study.

Other studies comparing distance education and traditional courses have found results contradictory to the previous studies. Warren and Holloman (2005) conducted a research study comparing student outcomes where one course section was a traditional face-to-face course and the other section was taught online. The 52 students were randomly selected to either participate in the campus course or the internet course. Students completed pre and post assessments in a self evaluation format which addressed their level of expertise regarding the competencies and objectives of the course. The results of the study indicated that there was no significant difference between the two sections. These data result include both the pre and post assessments, as well as the final grades.

Another study validating the no significant difference results was conducted by Summers, Waigandt, and Whittaker (2005) with undergraduate nursing students. The required statistics course consisted of thirty-eight students who were allowed to choose either the web-based course or the traditional face-to-face course format. The delivery system used to present the course was WebCT. The instructor was the same for both courses and the content was equivalent. Both course formats had the same exams and the same amount of time allocated for the purpose of testing, and both formats had a proctor present during exams. Although the results found the distance education students were less satisfied with the overall course, there was no significant difference in grades.

With the surge of distance education courses, there has been an increase in research investigating advantages as well as disadvantages of this learning format compared to other learning media. Such research has included studies that have investigated the overall academic performance of learners, student and faculty satisfaction, and the technology used to support distance education programs. However, as mentioned earlier, research studies focusing on proctored versus un-proctored exams have been rare. One recent study conducted by Wellman and Marcinkiewicz (2004) did focus on the impact of proctored versus un-proctored quizzes upon student learning. In



this particular study of 120 students, pre and post test were completed along with quizzes based on specific assigned chapters from the textbook. For their research Wellman and Marcinkiewicz defined learning as the change in the pre test and post test scores. Although no difference in text scores was found between the two groups, students in the online un-proctored group did outscore their proctored counterparts on the quizzes.

Designing a study similar to Wellman and Marcinkiewicz, the current research was based on using the measurement of test scores as a comparison between the proctored and un-proctored tests. In this study, the researchers were interested to find if student performance was influenced by the testing format, specifically proctored versus un-proctored.

## Methods

*Participants:* Undergraduate students who were enrolled in an Applied Medical Science course at East Carolina University. The research study started with 80 students which included both campus and distance education students. Before the cohort was divided into 2 groups (proctored versus un-proctored), two students withdrew from the course leaving a total of 78 students. Of the total there were 19 males and 59 females. There were three students who did not complete the consent form for the study leaving a total of 75 students. The students were randomly divided into two groups. Group 1 (un-proctored) had a total of 38 students which included 23 campus and 15 distance education students. Group 2 (proctored) had a total of 37 students which included 23 campus and 14 distance education students.

*Course:* The Applied Medical Science course is a required course for students seeking a degree in either Health Information Management or Health Services Management. All students had taken the same prerequisites and were admitted to the program prior to enrolling in this course. The course is divided into 3 sections due to the large number of students in the program. One section is considered distance education, while the other two sections are counted as campus courses and are taught on two different days due to inadequate space in the classrooms. There is one instructor for all three sections, and the required textbooks are the same. Although two sections of the course are considered campus format, none of the students are required to attend class because the instructor uses video recordings for the lectures. Using mediasite technology, these recording are placed on WebCT, the distance education delivery support technology. Therefore all students can view the same lectures and power points used in the teaching. All content information can be found on WebCT. The only requirement for attending class was for those students who took the proctored examinations. Computer-aided testing was used for all students.

*Procedure:* The students were given a consent form at a program orientation at the beginning of the semester. Students who were not able to attend the orientation received a consent form in the mail to be signed and sent back to the university prior to the start of the semester. The entire cohort of students was divided into 2 groups and was randomly assigned to either the proctored exams or the un-proctored exams. All students were told they could not use textbooks, notes, or talk with other students when taking the exam. During the semester, the students were given 4 multiple-choice exams which consisted of 35 questions per exam. Group 1, the un-proctored students, were free to take their exams at their leisure, but within a specified time frame. Group 2, the proctored students, were assigned to come to class on a specific day and time to take the exam, or assigned to be proctored at a local community college. The students who came to the university were proctored by a faculty member in the Health Service and Information Management Department at the university, while the students at the community college were given a specific time to report to the college. All students took their exams through WebCT interface. The time allocated for the exams was the same for all students. The only difference between any of the groups was the time of day, and the day of the week allowed to take the exam.

## Results

This current study was designed to determine if a relationship exists between method of test delivery and student performance. Students were given 4 exams during the semester.

### *Test Results*

**Exam 1:** There were 37 un-proctored students who took exam 1. There were 34 students who took the exam with a proxy. Three students withdrew from the study prior to exam time and one student attempted to complete the exam at a local community college, but found the prearranged proxy unavailable to proxy the exam.

**Exam 2:** There were 36 un-proctored students who took exam 2. Out of the original 37, there was one student who did not take the test. There were 32 students who took the exam with a proxy. Of the 35 remaining students, one student withdrew from the study and 2 students did not take the exam.

**Exam 3:** There were 36 un-proctored students who took exam 3. Of the 37 students, one student did not take the exam. There were 33 students who took the exam with a proxy. Of the 35 remaining students, one student had a medical withdrawal and one student did not take the test.

**Exam 4:** There were 35 un-proctored students who took exam 4. Of the 37 remaining students, two did not take the exam. There were 31 students who took the test with a proxy. Of the 34 remaining students three students did not take the exam.

### *Exam Scores:*

**Exam 1:** The mean score for the un-proctored students was 81.3, while the mean for the proctored students was 73.8.

**Exam 2:** The mean score for the un-proctored students was 90.2, while the mean for the proctored students was 82.8.

**Exam 3:** The mean score for the un-proctored students was 92.2, while the mean for the proctored students was 88.2.

**Exam 4:** The mean score for the un-proctored students was 84.2, while the mean for the proctored students was 80.8 (see Table 1).

Relationship between exam scores: To determine whether the relationship between the mean test scores for each group was statistically significant, a T-Test, assuming equal variances, was used to compute the significance (see Table 2).

To further characterize the relationship between exam scores and test delivery methods, Grade Point Averages (GPA) were calculated. The mean GPA for group 1 was 3.08, while group 2 had a mean GPA of 3.06 (see Table 3). In addition to comparing the GPAs, the ages of both groups of students were compared to reduce the possibility that age was a contributing factor in the scores. The mean age for the un-proctored students was 27.8, while the mean age for the proctored students was 23.8 (see Table 4).

**Table 1**  
**Summary Statistics**

*Summary Statistics for Scores on Exam 1*

	<u>N</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>	<u>Variance</u>
Un-proctored	37	53.00	100.00	81.3	12.0	144.3
Proctored	34	43.00	99.00	73.8	15.1	230.8

*Summary Statistics for Scores on Exam 2*

	<u>N</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>	<u>Variance</u>
Un-proctored	36	63.00	103.00	90.2	13.6	125.3
Proctored	32	54.50	101.00	82.8	11.1	185.2

*Summary Statistics for Scores on Exam 3*

	<u>N</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>	<u>Variance</u>
Un-proctored	36	59.00	105.00	92.2	11.61	23.4
Proctored	33	50.00	104.00	88.2	11.11	35.8

*Summary Statistics for Scores on Exam 4*

	<u>N</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>	<u>Variance</u>
Un-proctored	35	55.60	105.00	84.21	2.61	60.0
Proctored	31	45.10	97.00	80.81	0.81	18.0

**Table 2**  
**T-Test Analysis of Exam Scores**

	<u>UP (M)</u>	<u>P (M)</u>	<u>Diff</u>	<u>T</u>	<u>Probability</u>
Exam 1	81.33	73.80	7.52	2.32	.023*
Exam 2	90.22	82.85	7.36	2.44	.017*
Exam 3	92.22	88.27	3.94	1.44	.154
Exam 4	84.24	80.84	3.40	1.16	.249
Total	87.00	81.44	5.56	1.41	206

\*Correlation is significant at the 0.05 level.

**Table 3**  
**Summary Statistics for Grade Point Averages**

	<u>N</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>	<u>Variance</u>
Un-proctored	37	1.90	4.00	3.08	.54	92.10
Proctored	34	2.2	4.00	3.06	.43	31.74

**Table 4**  
**Summary of Statistics for Student Ages**

	<u>N</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>	<u>Variance</u>
Un-proctored	37	19	56	27.8	11.5	37
Proctored	34	18	50	23.8	7.9	32

## Summary and Discussion

### *Purpose*

The purpose of this study was to determine whether a relationship exists between test performance and method of test delivery among undergraduates students in a medical science course offered at East Carolina University.

### *Methodology*

The sampling frame was the students enrolled in the medical science course. The students were randomly divided into two groups. Group 1, un-proctored students, completed the course exams at their leisure without a proctor, while group 2, proctored students, completed the same exams while being proctored either at the university or via an independent proxy. Faculty version 15.0 of the Statistical Package for the Social Sciences (SPSS) was used for statistical analyses. Frequencies and summary statistics were computed for exam scores of both groups of students. The mean and standard deviations were computed for each group's scores, and for each group's grade point average. A T-Test was computed between each groups' test score to determine the relationship between the two variables.

### *Student Sample*

The students in the sample were those who had already enrolled for the course. All of these students were in the same program and had the required prerequisites for the course. Since there could be a difference in performance between the distance education and campus students, each cohort was randomly assigned to be either un-proctored or proctored. In order to control for the possible influence of previous academic achievement on student performance, GPAs were calculated for both cohorts. There was no significance difference in average GPA between the two testing cohorts. The only noticeable difference between the students was the ratio of males to females. All students were given the same study materials and access to lectures via the *medisite* network.

### *Exam Scores*

Although the average test score across the four exams was consistently higher for the un-proctored group compared to the proctored group, this difference was only statistically significant for the first two exams. One possible explanation for this finding could be that proctored students began to study more diligently recognizing that no assistance would be available during the exam. There is also the possibility that proctored students were more nervous or uncomfortable during the first two exams and began to feel more at ease with the last two exams. Finally, there is the possibility that exam scores were higher for un-proctored students because of the advantage afforded by being un-proctored: that is they could have accessed the text and other resources during the exam.

## Conclusions

The findings of this study show that there was a difference between student performance and test delivery method. However, the overall difference was not significant. The assumption that there was a significant difference between test performance and test delivery method was only substantiated on half of the exams. Since there has been little research addressing this issue, it is difficult to make comparisons with other studies. However, the results were consistent with research by Wellman and Marcinkiewicz (2004) when addressing test scores only.

## Recommendations for Future Research

This study provides information on student performance and test delivery methods. A larger study including more students and more frequent testing would help to further knowledge of the relationship between performance and test delivery methods. Also a larger study would be more generalizable to other students, courses, and colleges/universities.

This research addressed a growing concern which is the relationship between student performance and test delivery methods. To test the hypothesis that un-proctored students tend to outscore proctored students because they have potential to access test taking resources, it would be useful to set up a study where all learners are subjected to exactly the same test taking conditions: that is their access to the internet will be blocked during the test as well as electronically proctored via webcam and surveillance software.

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**Editor's Note:** This paper offers a useful, practical and astute analysis of problems facing valid and cogent implementation of Distance Learning in India.

## **Internet –A Technological Channel for better Distance Higher Education in India**

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**India**

Indian distance higher education is largely print-based with some audio-visual support for learners. Use of internet-based technologies in distance learning is still in its juvenile stage. Until recently the planners, administrators and academicians were skeptical about the potential effectiveness of internet-based technologies in the existing pattern of teaching and learning. This was more so because easy internet access was restricted to big towns and cities only. But with the coming of broadband and increase in awareness among the masses, internet access has spread throughout the country. With the rise in the IT sector, terms like e-business, e-banking and e-learning have become popular. Use of internet in education, in general and distance education in particular, has come in the limelight. Hence, it is important to throw light on the potentialities of internet technologies and study the present situation of distance higher education in India suggesting the guidelines to make improvement in education via improvement in design and expanded use of internet based technologies. It is in these contexts that the authors have presented this paper.

**Key words:** Learner friendly content, hyperlinks, flexibility, control, productive learning, limited bandwidth, slow modems, School of Computer and Information sciences, Indira Gandhi National Open University.

### **Introduction**

Distance education, since its inception in India, has been subject to technological innovations. Whenever a new technology came up, it was tried in the field of distance education but always as an adjunct to print medium. The result is that the basic structure of distance education in India has remained the same. The institutions responsible for distance learning have realized its growing demand with time but are not ready to come out of the tried and true pedagogy of lectures based on renowned books, tutorials and student testing by means of closed-book examinations. However, with the change in market conditions and consequent rise of a new work force which needs to acquire new skills and constantly retrain itself to remain employable and improve career options, there has been an increase in demand for tertiary education by distance mode so that the adult employed learners can maintain a balance between their learning and other responsibilities. The new distance learners of today demand accessibility to the most recent and up-to-date education free from the spatial and temporal constraints. These demands cannot be fulfilled without change in the *status quo* of distance education and assimilation of appropriate technologies at appropriate places in its *modus operandi*. The advent of internet technologies in the arena of distance education can bring about radical changes in the mode of delivery and reception of instructions and result in effective and efficient learning according to the preferences and reservations of the learners provided the internet technologies are used strategically and pragmatically.

### **Educational needs of distance learners and internet**

The basic difference between regular and distance mode of learning is that in the latter the main onus of learning is on individual learners since they get little chance of interaction with their tutors as well as their fellow learners. It is well established that the content and the social

environment of the learners play important roles in facilitating learning. The learners learn best when the content as well as the social environment is learner friendly. It is important to discuss the role of both these in detail.

### **Role of content**

When it is said that the content is learner friendly, it means that the content is relevant to the life and work place of the learners. It is well accepted that quality learning outcomes are more likely to occur when learners adopt a deep approach to learning (Ramsden, 2003) and learners' perception of the learning context is a strong determinant over which academics have influence (Freeman *et al*, 2005). This context relevant learning cannot take place in present days when huge amount of information is pouring in at a very fast speed unless the content is continuously modified to meet the ever changing needs. Here comes the role of internet. The traditional study material offered to distance learners is a pre-produced, structured linear text with few graphics, assignments and references to other related studies sometimes with some external audio and video support common to all the learners.

When content is developed using internet resources, the text is somewhat less structured and contains a number of hyper links including video clips, audio clips and other relevant text based resources which the learners can access according to their needs and interest. Thus students do not have to follow the same path in learning as others. The entire course content is not a pre-produced package but a basic platform for the learners wherefrom they can move in a direction that suits their requirements. This is in favour of a majority of learners as they need not go to study centres or wait for postal delivery for their study materials. They can access up-to-date learning materials with added benefits of flexibility of time, place and pace in learning and get ample opportunities to actively involve in the learning process.

### **Role of social environment**

When it is said that the social environment is learner friendly, it means that the learners are able to relate to the environment during the learning process. They have a feeling of belongingness to the institution where they are studying, are able to discuss their doubts and difficulties with their tutors and fellow learners in class and after class and are able to use the learning resources of their institution efficiently and effectively to facilitate their learning. All this is available to distance learners also but in a limited manner. Their interaction with their tutors and fellow learners are restricted mainly to the counseling sessions at the study centres. These study centres are generally situated in other educational institutions to which the learners do not belong. Even the teaching faculty is not of their institution and is hence not directly responsible to them. So being students of one institution and attending classes in another institution sometimes prevents them from developing a feeling of identity with their institution. This may sometimes result in feelings of frustration and isolation. Internet is a very good solution of this problem.

An important feature of internet is that it takes interaction with the tutors and fellow learners outside the boundaries of classroom where the meeting times are limited. It has certain tools that can foster development of a virtual community of learners outside the real community. The students and teachers of a distance learning institution can interact with each other synchronously and asynchronously and discuss the course content and related doubts and difficulties. This is suitable even for the shy and introvert students who hesitate to participate in face-to-face discussions because of fear of peer ridicule and therefore fail to become a part of the learning community in spite of their physical presence. They get a chance to interact in these virtual communities due to gained anonymity and if they make some efforts in the beginning they may eventually transform themselves into active participants.

E-mails are very good means of one to one interaction with tutors and also for timely feedbacks which can be very effective for learners. Discussion boards and synchronous chats serve as

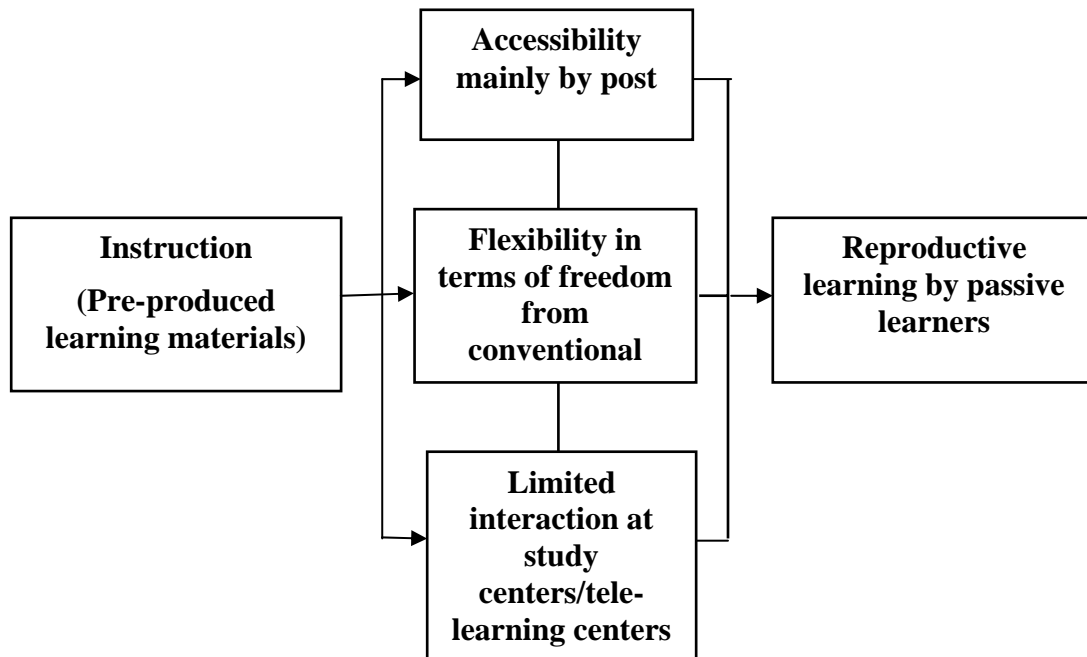


excellent media where learners can speak and hear i.e., *Share with Peers Electronically* their *Acquired Knowledge* and *Have Electronic Access to their Responses*. Not only this they can also discuss their tentative understandings, clear up misunderstandings and construct their meanings of the content. Thus there is a shift from repetitive to productive learning and results in individual students acquiring a sound knowledge base.

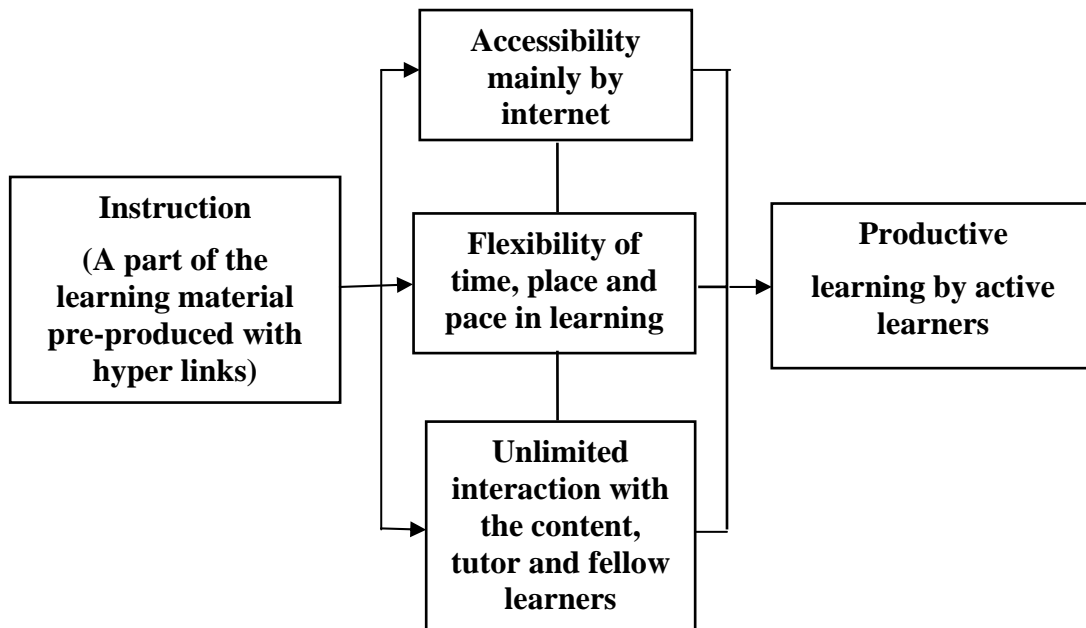
Thus it can be said that internet is a boon for distance learners as it provides them:

- Easy access to most recent study materials
- More flexibility of time, place and pace in learning
- More interaction with content, tutors and fellow learners on one to one basis as well as a community
- Opportunity for learners to control their learning

The difference between distance education without and with internet access can be clearly understood with the help of the following figures:



**Figure 1: Traditional distance learning**



**Figure 2: Internet based distance learning**

### **Considerations in Internet usage**

The Internet seems to be a lucrative idea in distance education. However, mere use of technology is not sufficient. Before bringing internet in practice in distance learning there are certain issues which have to be taken under consideration:

- Is the Internet a better way to learn? Will learners learn more or faster using internet?
- Will it reach of the majority of the learners in terms of available courses, access and cost?
- Will organizational aims be achieved; these aims can be economic, political and social?
- What is the preferred mode of learning – independent study or tutor facilitated study – for the majority of the learners?
- Do learners possess the necessary technical skills, motivation, self discipline, time management skills, ability to work alone, and ability solve technical problems needed to effectively use the Internet?
- Are the teachers trained and ready to adapt their teaching skills and pedagogy for Internet learning?

Technology should never override education or be used just to bring novelty in pedagogy. It has the power to improve the actual process of learning and reach students who, for a multitude of reasons, cannot attend on-campus classes. The number of learners served is growing much faster than on-campus learning programs.

The use of internet in most of the courses in India and even outside India is simply that the courses are digitalized, placed on the institution/university's website and downloaded by bonafide students. This is quite suitable for students who are set in a structured pattern of learning. They pick up the study material from internet, go through it, attend counseling sessions at the study centres according to their needs, complete exams and get degrees. It is similar to the conventional

methods with a major difference; students can access the study materials from wherever they want. Distance learning is advantageous for learners whose schedule, work and family responsibilities do not permit them to attend classes on campus. Also higher education, whether by regular or distance mode, should operate beyond knowledge and understanding, it should be thought provoking and take students to higher levels of learning. Internet and associated technologies have the potential to bring about radical changes in the learning patterns of all types of learners, so efforts should be made to use internet technologies to produce the desired results.

### Internet in distance higher education in India

In India, internet in education is a recent phenomenon. Until recently limited bandwidth and slow modems which hampered the delivery of sound, video and graphics, high cost of personal computers and internet connection, low awareness and technical skills in computer and internet operations had stood in the path of large scale internet usage in the field of education. However from time to time, initiatives have been taken in this direction especially in the field of distance learning but only as peripheral activities. With the upsurge in demand for a computer-skilled workforce in the market, inflow of information from all directions, coming of broadband and lowering of cost of personal computers, awareness has increased among the masses. In a survey on the students of School of Computer and Information Sciences, Indira Gandhi National Open University (IGNOU) enrolled during the period 2002 to 2005, the authors found that of the 267 usable responses to the questionnaire which was mailed to 1200 students, more than 50% of the students reported no problem in accessing internet in general and the website of IGNOU in particular as shown in Table 1. Though it is not possible to draw any definite conclusion from such small sample, it definitely suggests that the use of technology is improving all the time. Another finding of the survey was that the computer skills and the frequency of using internet depended on the course of study of the distance learners as shown in Table 2.

**Table 1**

**Computer Skills of selected students in different courses of IGNOU**

Course	Computer Skill	Percent	Cumulative Percent
<b>BIT</b>	Beginner	0.00	0.00
	Intermediate	20.69	20.69
	Expert	79.31	100.0
<b>ADIT</b>	Beginner	0.00	0.00
	Intermediate	24.00	24.00
	Expert	76.00	100.0
<b>MCA</b>	Beginner	1.33	1.33
	Intermediate	53.34	54.67
	Expert	45.33	100.00
<b>BCA</b>	Beginner	13.46	13.46
	Intermediate	76.92	90.38
	Expert	9.62	100.00
<b>CIC</b>	Beginner	75.00	75.00
	Intermediate	25.00	100.00
	Expert	0.00	100.00

**Table 2**  
**Frequency of Internet Access in different courses of IGNOU**

Course	Frequency of Internet Access	Percent	Cumulative Percent
<b>BIT</b>	Rarely	0.00	0.00
	Occasionally	24.14	24.14
	Frequently	75.86	100.00
<b>ADIT</b>	Rarely	0.00	0.00
	Occasionally	28.00	28.00
	Frequently	72.00	100.00
<b>MCA</b>	Rarely	10.66	10.66
	Occasionally	46.67	57.33
	Frequently	42.67	100.00
<b>BCA</b>	Rarely	17.31	17.31
	Occasionally	63.46	80.77
	Frequently	19.23	100.00
<b>CIC</b>	Rarely	62.50	62.50
	Occasionally	21.88	84.38
	Frequently	15.62	100.00

From Table 2, we learn that the students of Bachelor in Information Technology (BIT) and Advanced Diploma in Information Technology (ADIT), courses run under Virtual Campus Initiative, were highly skilled in computer usage and frequently accessed internet. A majority of students of Master in Computer Application (MCA) and Bachelor in Computer Application (BCA) course of study possessed intermediate level of computer skill and occasionally accessed internet while maximum students of Certificate in Computing (CIC), which is just six months course, were least skilled and rarely accessed internet.

Thus it can be interpreted that it is computer literacy coupled with the requirement of internet access in the respective course that is the real determinant of internet access for students in present days distance higher education in India. Only a few students access internet out of interest and motivation to do something different. However, further studies on much larger samples are required to substantiate these findings. If internet access is woven in the course material and learners are provided proper training and guidance at appropriate places, then definitely internet would draw and sustain the interest of learners throughout the learning process.

#### **Guidelines in internet usage in distance education**

For proper planning and implementation of internet technologies at different stages in distance higher education, certain guidelines proposed by different authors have to be considered.

Before starting any internet based course a sort of mental preparation of students is necessary. They should be oriented regarding what internet based learning is. The skills that are expected of them in the virtual learning environments should be explained to them and interested but less confident students should be given a short training so that they will not feel intimidated

anywhere. The roles of the students as well as the tutors in the learning environment should be clarified in the beginning itself. The students should be made aware of the internet based tools and other support available to them during the learning process.

Providing hyperlinks to various resources in the study content does not necessarily support learning. Learners may get lost in cyber space resulting in demotivation, overload, isolation and eventual attrition. Moreover, learners need structure in learning content. Absence of structure can frustrate them. The huge amount of information available on the internet should be streamed with easily accessible hyperlinks to provide purposeful and thematic access and sequence to relevant study materials.

Participation in online discussions requires learners to have typing skills. In the absence of non-verbal cues, small doubts and confusion may impede learning. The initiative of tutors is especially important in this context. They have to play the role of moderators and guide and intervene in the discussions wherever distractions and misconceptions occur. Precision and concision should always be maintained on the part of the tutors or instructors. Furthermore, the tutors have to see that the discussions are not dominated by only a few students.

Though such discussions are reflective, they are time consuming especially for employed learners. Such learners may not want to interact with fellow learners. They value their interaction with their tutors only. Keeping in mind the academic needs especially of such learners, the tutors should open a separate e-mail account for students' queries so that they are not mixed with other e-mails and get deleted by mistake. They should always reply to the students' queries as soon as possible and also provide them timely feedback on a one-to-one basis. A *Frequently Asked Questions* database should be prepared and continuously updated for all courses separately on the institution/university's website to avoid repetition of same queries and lighten the work load of tutors.

A very big challenge to internet based learning is the absence of physical existence, the facial and hand gestures which provide important cues to the meaning and feelings of others. This area of communication is very difficult to obtain in an online environment especially in the starting phases and requires a lot of patience on the parts of both tutors and learners and high level of academic and technical support services. If the concerned authorities think that just by providing services their duties are over, then this may result in disaster. It has to be ensured at all levels that the services are properly implemented and any omission and/or lack of response should be taken care of immediately.

## Conclusion

While implementing any technology it is very important on the parts of both the providers and the receivers that they take a positive stance. If we keep talking about the impediments and get intimidated by the new technology in question, there cannot be any major development. There are a number of review-based studies on Internet and a lot has been said about it as a promoter of distance learning but now it is necessary to test its pedagogical efficacy in real situations. A number of empirical studies have to be carried out on various aspects of internet based distance education and criteria for effective learning have to be developed to maintain quality standards of distance learning programmes. Initially all this may seem to be costly, but eventually, through sustained efforts of researchers, administrators, tutors and learners, it may result in radical change in distance learning that truly bringing education to the doorstep in a very real sense.

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