

E-LEARNING: A SURVIVAL STRATEGY FOR DEVELOPING COUNTRIES

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Abstract

In today's global economy, developing countries must provide a skilled workforce to attract business, and lifelong learning to retain it. Education is no longer an option; it is the prescription for economic survival. In the past, top students were those who mastered the most information. Today, the winners are those who can analyze, use technology, write well, and possess strong social skills. This presentation describes an innovative, blended learning approach for delivering science training throughout the Pacific. The program interweaves eLearning, virtual and face-to-face laboratories, blogs, Tweets, chats, and web-based synchronous communication to create a supportive virtual classroom that encourages student success and satisfaction. The eLearning classroom is a highly interactive environment where students meet classmates, the facilitator, and the tutors. Further support comes from learning teams and weekly feedback on performance. The course is delivered from Fiji to Tonga, Vanuatu, The Solomon Islands, Kiribati and Tuvalu. Although blended learning offers great promise to meet the changing needs of industry, universities struggle to adapt. This presentation concludes with a discussion of faculty and administrative barriers experienced by the University of the South Pacific, a regional university serving 12 member countries in Oceania.

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Table of Contents

INTRODUCTION	3
BACKGROUND	4
PROJECT DESCRIPTION: <i>eChemistry</i> and <i>eTeacher Training</i>	6
Instructional Design	7
Figure 2. eChemistry Welcome page on Moodle	9
Technological Learning Innovations.....	9
Research Team and Project Website.....	10
FACULTY AND ADMINISTRATIVE BARRIERS TO CHANGE: Problems and Solutions ...	11
Faculty Barriers.....	11
Administrative Barriers	12
Recognition and Remuneration	13
Student Services	13
Time: Course development, teaching.....	Error! Bookmark not defined.
Teaching Load	Error! Bookmark not defined.
Time from Research	Error! Bookmark not defined.
Technological Infrastructure.....	13
DISCUSSION.....	14
BIBLIOGRAPHY	15

INTRODUCTION

Information is now a commodity, accessible with a click of the mouse. Today, information is no longer the primary goal of education. The rules have changed. In the global market, companies must have workers can apply, solve, and create Workers must be able to work in teams, write, and speak. The challenge facing universities is to adapt to changing market needs in this technological economy (Herbst, 2008). Academics must teach more than subject content. One way to do this is to put away the chalk and pick up active learning, the Internet, and educational technology (Bower, 2001; Bruner, 2007; Gerlich, 2005).

When for-profit entrepreneurs, like the University of Phoenix, identified mid-career workers as a new market, they did not hesitate. Recognizing that workers needed to up skill and earn degrees to progress in their careers, the universities went online. For the working professional, accessibility and convenience were the selling points because working people must balance family and career. They cannot sit in a classroom for 12 weeks. That reality was driven home a dozen years ago when one of my online students was a fighter pilot. The first week of class he logged on from England, the second week from France, the third from Spain, and the last two weeks in Italy. Wherever his jet took him, he logged on, never missing class.

Gradually, mainstream universities have awoken to the fact that during a time of reduced budgets and slowed enrollment growth, enrollments have soared at online universities. By 2010, the University of Phoenix enrollment surpassed 300,000. Countries must provide greater access to education and the reality is that need can only be met using educational technology and distance learning to reach every corner of the world. The solution is not *Ivory Towers* that choose the best students, locking them in a classroom for three to four years. The path to success for nations is to find ways to educate more of the population with the skills needed for tomorrow.

The obvious solution is online learning, but change is never easy. Many universities continue to resist business models (Adams, 2008) that help meet the changing needs of students and industry (Tanzer, 2007). What most people need is employability and career growth, and the market is for educational programs offer such training. Universities that cling to past programs and approaches are discovering that students will take their business to educational providers that best meets their needs. Mature working students understand they have choices, and increasingly that choice is to learn online. One example of that illustrates this change is student I interviewed. He had completed all but two courses in his masters degree. He would have finished, but was delayed because courses were either cancelled or did not fit with his work schedule. His solution was simple. He transferred to another university for the last two courses. That institution gave full credit for the previous courses and awarded the degree.

As universities move to deliver lifelong learning and increased educational access, eLearning is a good fit. Using this blended approach, universities can shorten semesters, offer more courses every semester, and reach citizens throughout the country. Since eLearning allows students to study *anytime-anywhere*, basic education and up skilling becomes more available to more people. Of course, universities must also provide online registration, electronic access to university services, and prompt feedback. Multi-signed pieces of paper need to give way to online services to serve new educational markets (Asian Development Bank, 2008).

Another reason for eLearning is cost of delivery. Faced with reduced funding, universities must deliver education that is cost effective

This paper describes an eLearning design used in a first-year chemistry course offered to developing countries throughout the Pacific. The paper concludes with a discussion of barriers to change that one university experienced in developing educational innovations and business approaches to learning (Magaud, 2007).

BACKGROUND

Since 2000, the growth in eLearning, a blended approach that combines online and face-to-face training, has exploded. Allan and Seaman (2007) reported online enrollment in the United States increased by more than 20% a year between 2002 and 2006, which is about six times greater than enrollment growth in on-campus classes. In a recent study of more than 14,000 university students, more than 85% of the students used a course management system (CMS) in their classes (Gastfriend (2008)). This educational revolution has been led by for-profit universities, followed by community colleges (Bradburn & Zimble, 2002) and universities. Private universities have been the slower to change (Waits & Lewis, 2003).

While eLearning has become a norm in the United States, it has just reached adolescence in the Pacific due to academic isolation, struggling economies, and limited technology. However, Internet has arrived, computers are less expensive, and young people have embraced the Net and cell phones. What began with texting and email, quickly spread to YouTube, Twitter, and Facebook. In this region, it is the students who are demanding eLearning. While universities might prefer large lecture classes, correspondence courses, and instructor-led face-to-face classes on exotic islands, economic reality is forcing change. In a time of reduced funding, increasing academic competition, and declining enrollment, eLearning is being considered more and more as the way to increase educational access to low-population islands situated across one third of the Earth's surface. The need is great, and after 40 years of conventional educational approaches, a large percentage of teachers on rural islands remain untrained.

For example, although the educational system in the Marshall Islands has made progress, several challenges remain (Bélanger & Liu, 2008). The first is the need to improve the quality of existing teachers. On rural islands, such as Wotje, the majority of the teachers hold only a high school diploma, and throughout the country only 2% of primary and 36% of secondary teachers hold a bachelor or graduate degree (Heine, 2007). Teachers who need to complete degree and continue professional development training are limited by their isolation. Roughly a third of the population live scattered on outer islands where it is not viable to establish campus centers. According to Kavita Rao (2007), Pacific countries like the Marshall Islands are investigating educational innovations to improve access to and quality of teachers.

The early criticisms of online learning came from both faculty and administrators. Faculty and administrators worried about course quality (Pachnowski & Jurezyk, 2003) and student success. Even today, the attrition rate for distance learners is an issue. According to Angelo, Williams, and Natvig (2007), attrition rates for distance learners are 10% to 20% higher than for face-to-face learners.

Online course quality remains a concern of faculty and some administrators view it as a poor substitute for face-to-face teaching (Frey, Faul, & Yankelov, 2003). Others argue that online degrees may be less acceptable to other universities and employers (Adams, 2008). However, Allen and Seaman (2007) reported that the quality rating by administrators had risen

from 57% in 2003 to 62% in 2006. Campbell et al (2008) found that nursing students in a purely online course were as successful as students in a blended delivery (online plus face to face).

Faculty issues included suitability of their subject for online delivery, isolation from students, and the additional time required to teach online (Shank, 2005). Other faculty concerns included class size (Dibiase, 2004), adequate compensation (Parker, 2003), workload, credit toward promotion and tenure, and technical support (Bower (2002, Rockwell et al, 1999). Faculty may be subject specialists and excellent teachers, but this does not ensure they have good computer technology and online skills. For such teachers technical support and training are additional concerns. As a result older faculty often prefer face-to-face over online teaching (Gerlich, 2005; Myers, Bennet, Brown, & Henderson, 2004). However, with support and training, computer-challenged instructors can be convinced to transform from blackboards to blogs. A key to convincing teachers limited computer experience to consider eLearning is training and support.

Minotti and Giguere (2003) reported that Web learning can be as effective as face-to-face teaching and that some students preferred online teaching over face to face. In a study reported by Wuensch (2008), students rated online courses more convenient than face-to-face teaching.

In the South Pacific, another issue is cultural appropriateness. Matthewson and Thaman (1998) suggested that distance learning is contrary to regional cultural needs because it increases student/teacher separation. A study by Marsh and Hogan (2005) did not support this view. Instead, the authors reported that students in Samoa and Vanuatu were eager to work in an international setting in which student teams were separated by thousands of miles. More recently, the Asia Development Bank (2008) confirmed the need to increase educational access and recommended the region develop more online programs.

Nevertheless, there are cultural barriers to that must be addressed to develop an effective online program. One such barrier is lack of critical thinking skills. For many students raised in a culture of respect for authority and elders, they can be uncomfortable participating in class discussions, debates, and team activities, lest their actions be viewed as a sign of disrespect (Robbins (2004). Wang (2007) supports this finding, reporting that students raised in a culture of respect for elders and persons in authority are less inclined to participate in online activities

Gender can also be a barrier to online learning, causing students to be reluctant to participate in mixed-gender and intercultural groups. Often, Pacific Island students prefer to work in homogenous groups or to work alone. Language can also be a barrier. Although English is the language in pre-college and university teaching, for many students English is their second, third, or even fourth language. In Vanuatu, for example, there are three official languages – English, French, and Bislama. In addition, there are 113 indigenous languages that are still actively spoken. Therefore, teachers must develop teaching materials at the appropriate level to accommodate such cultural diversity (Hussin, 2007; Rutherford and Kerr, 2008).

In developing an online learning program, language is still another important consideration. Although English is the language used in pre-college and university teaching, for many students English is their second, third, or even fourth language. In Vanuatu, for example, there are three official languages – English, French, and Bislama. In addition, there are 113 indigenous languages that are still actively spoken. All of the university member countries are multilingual, which must be carefully considered in developing online courses. Therefore, online teachers must be alert that teaching materials are written at the appropriate level to accommodate the cultural diversity (Hussin, 2008; Rutherford and Kerr, 2008).

The last barrier to change discussed in this paper is the *university*. Transitioning from face-to-face classes to a technology driven online program is a major change that requires support from faculty, university boards, and administrators. Davis and Batkin (1994) point out that organizations change only when confronted with external demands such as the current global turmoil. However, even in the face of such a crisis, institutions may be unable to adapt. Institutional barriers include administrative inertia, management style, vision, technology, mid-level managers, and faculty resistance. For change to take place, administrators must be open to change, and they must have a strategic plan to implement change (Toffler, 1985). Unless a university leader has both a vision and a plan, change will be slow. Each of these institutional barriers encountered in this study are discussed in the presentation.

This project was developed as a model to encourage faculty to use new teaching options in their face-to-face and blended-learning courses, following principles promoted by Kanuka, (2003), Morgan (2003), and Mortera-Gutiérrez (2006). In this online course, teachers use an arsenal of teaching approaches and technologies designed to prepare students to stand toe to toe with their peers throughout the world. Within an academic climate of cultural respect, education cannot continue to teach barefoot, Technology is not an educational option—The blackboard is dead, replaced by an online whiteboard that students and teachers write on mice and track balls.

PROJECT DESCRIPTION: *ChemOnline*

This eLearning innovation is a first-year chemistry course that was previously available face-to-face and by correspondence course. One academic problem with the print delivery is that distance students do less well, compared to face-to-face students. Working in isolation, distance students submit assignments that often take six weeks or longer to be returned as illustrated in Figure 1. Not infrequently, students do not receive their graded assignments until the course is over. A related administrative problem is cost of delivery. Printing and shipping the materials and sending instructors for brief face-to-face sessions are becoming prohibitively expensive.



Figure 1. 6-week minimum shipping time for DFL Courses

The academic goal of the *ChemOnline* initiative is to give students at distance every resource available to on campus students—access to the instructor, tutors, and other classmates. The administrative goal is to use educational technology to increase educational access, improve cost quality, and reduce the cost of delivery. This first-year, online chemistry course is delivered to students in Vanuatu, Solomon Islands, Kiribati, Tuvalu, and Tonga.

ChemOnline is designed meet each of these goals. The online students, in fact, have more resources and instructor access than the on-campus students. For example, in the face-to-face classroom students have two lectures and one tutorial session per week. In *ChemOnline* students have access to their instructor 5 days per week and their tutor 24/7. In addition, the course promotes peer tutoring (van Rosmalen et al, 2008).

ChemOnline is a blended course, in which students work 80% of the time in the virtual classroom and with their tutors. The students work on weekly online activities in online teams. The laboratories are face-to-face and students have the option to also attend a weekly in-person tutorial. Lab debriefings, test prep, and an International student debate activity use a web videoconference system just introduced at the university. Each of these activities is intended to actively engage students in their learning and to give students at a distance equal access to all course resources. Other online components include weekly discussion questions, simulations, video clips, Tweets, and wikis. All teams work together in blogs.

The aim instructional design encourages student interaction and analysis. The student-centered approach helps students develop socializing, presentation, and analytical skills. Chemistry was specifically chosen to demonstrate the applicability of online teaching for the *hard sciences* and for *first-year students* with limited computer and Internet skills. A common complaint from science faculty is, “Online may work for social sciences, but it does not work for the hard sciences.” This course is designed to dispel this myth.

ChemOnline is the model for the university. To assist faculty to grasp the educational approach and how to use the educational technology and the Net as a learning tools, the project has created a video *Teacher Handbook*, This video documents all course components, as well as research results and student comments.

We are especially grateful to the World Health Organization for their support and generous contribution of \$100,000 to implement our educational design within Moodle. If you wish to learn more about this research visit <http://elearn.usp.ac.fj/login/index.php>. The web site contains training materials, literature, and project reports.

Instructional Design

The instructional design of the *eLearning virtual classroom* reduces student isolation by engaging them in a supportive, highly interactive learning environment. The instruction methods include:

- Daily student contact—discussions, chats, audio/video calls, conference calls
- Weekly feedback and individual/team activities
- Face-to-face and simulated labs

- Resource redundancy: Web, CD), and print
- Application to real life issues
- Videoconferencing for lab briefs, test prep, and team debate
- Assignment feedback in 7 days

The Welcome course page for eChemistry is shown in Figure 2. The pages were designed to be simple for students to navigate. Since bandwidth varies significantly among the regional countries, every effort has been made to make the program Internet efficient. Photos and graphics are not included on the course pages and course materials can be downloaded in total or by chapter. To further assist students with low bandwidth, team rooms are not housed in the course management system. Instead, each team is assigned to a blog.




Question Forum This forum is where students post questions and get answers. The forum is a first-check resource that benefits students and the teacher. For personal questions, student conflicts, and team issues, students email the instructor.

A typical class week is shown in Figure 3. As shown, each week students engage in discussions that apply the chemistry topic to real-world problems, individual activities, and team activities. For exam, during the study of measurement, accuracy, and reliability, a class discussion asks students to apply the principles to argue for dismissal of a speeding ticket. During the study of gas laws students are challenged use principle to free a car stuck in sand (let air out of the tires), On the topic of solutions, the discussions apply the principle to salt water intrusion due to sea level rise. Students then investigate alternative solutions, such as desalination. Later in the course students investigate and argue the pros and cons of bio fuels.





The aim of all these activities and discussion is to 1) help students learn to analyze problems instead of accepting what others say and 2) demonstrate how science can be a cause and a solution for global issues such as air and water pollution, chemical wastes, and recycling.

CHF02 Foundation Chemistry




Course Information

-  [Welcome and Introduction](#)
-  [Meet your Instructor](#)
-  [News and Announcements](#)

Resources

-  [Class Policy](#)
-  [Course Study Guide](#)
-  [How to Use this Course: A Guide for Students](#)
-  [Tutorial Activities](#)

Forums

-  [Question and Answer Forum](#)
-  [Tutor Forum](#)
-  [Social Forum](#)

Team Activity Resources


-  [Team Learning Charter](#)


Figure 2. eChemistry Welcome page on Moodle

Technological Learning Innovations

The instructional methods selected for *ChemOnline* are aimed to promote student involvement, analysis, interest, and application of principles to real life. The weekly activities relate the subject of chemistry to environmental and social issues affecting the Pacific. Cultural applications are infused throughout the courses to help students connect chemistry to their own lives. The use of teams, discussions, and activities are intended to reduce the sense of isolation and increase the student's sense of ownership of the virtual classroom. The technological innovations used in the course are shown in Table 1. Each was carefully chosen to be compatible with regional bandwidth.


Week 4: Chemical Formulae

Building on last week's work, we'll continue writing and interpreting weight and percentage composition.

 [Week 3 & 4 Study Guide](#)

Class Discussion Questions

1. DQ1: Formula Calculation (Begin on **Monday**)
2. DQ2: Ideal Gases in a Real World (Begin on **Wednesday**)




 [Week 4 Class Discussion Forum](#)

Individual Activity

1. *Molecular Weight Calculator* (Begin on **Monday**)
Review the YouTube video *Calculating the Molar Mass*
[v=mDM_2BR5LnU](https://www.youtube.com/watch?v=mDM_2BR5LnU)
Then go to the molecular weight calculation, an online calculator
jmg.ch.cam.ac.uk/tools/magnus/MolWeight.html

This week you'll go online to use a virtual calculator, tackle a self-chosen international chemistry debate! (click on the link provided to take the debate)

Team Activities

-  [Week 4: Molecular Weight Calculator \(Begin on Monday\)](#)
-  [Week 4: International Chemistry Debate \(Begin on Monday\)](#)
-  [Week 4: Practice Quiz \(Begin on Thursday\)](#)

Quiz


-  [Practice Quiz 1](#)

Figure 3. Weekly discussion questions and activities

Table 1. Communication technology used in eChemistry

Class Activity	Audio/video Skype call	Blog	Moodle CMS	Chat	Web Conference	Twitter	Video-conference
Facilitator							
Tutor							
Student							
Team							
Debate							
Feedback							
Lab Rev							
Test prep							

Project Website

The research team that developed *ChemOnline* consisted of faculty from Education, Chemistry, Mathematics, Social Studies, Student Support, and Foundation Studies. In addition the University of Hawaii Department of Education was an invaluable resource that provided guidance on student-centered chemistry in the South Pacific. A team member from California State University guided the project research design. The World Health Organization supported the course development on Moodle through a generous grant. The team members are listed on

the project web site at <http://groups.google.com/group/ESTAL>. The website includes contact information and resources: literature search, project description, minutes, project reports, and course materials.

FACULTY AND ADMINISTRATIVE BARRIERS TO CHANGE: Problems and Solutions

The Problem

A decade ago, computer technology and bandwidth were the barriers to online learning. In the age of floppy disks, 20meg hard drives, and T1 lines, online learning was constrained by the technology. The technological revolution has changed that. Ten years ago the cost to video link eight European universities and US was nearly \$100,000. In 2010 it just takes Skype, GoodgleTalk, or similar Internet software. Technology is no longer the limiting factor. Today, the barriers are faculty and university administrators.

In this section, we discuss the barriers and solutions. The reality for universities is that industry and students demand it. Universities that do not offer online courses will lose customers to other vendors. This change has begun. When community colleges first began online programs, state universities hesitated. Looking out from their *ivory towers*, faculty and administrators watched amusedly at the antics of the two-year miscreants. The smiles disappeared when university students discovered they could take online courses from community colleges that were cheaper and more convenient. Students used these courses to graduate sooner, saving time and money. Public universities went online.

The move to online has been accelerated by the global economic meltdown. Academic institutions face increased competition and reduced funding from government and dollars. As a result universities must increase income and reduce cost of delivery to generate needed income. An institution may have the best academic programs, but that means nothing if it cannot afford to offer it. Raising tuition and cutting programs is not the answer. Once in-state, out-of-state, and international tuition rates were as certain as taxes. No longer. As universities seek to widen their market, some have lowered out-of-state tuition to tap the wider market (Glater, 2008). Joliet Junior College took an even bolder step when it began charging the local tuition rate for all online students (Joliet Junior College Admissions, 2009).

As more universities adopt this market practice, this will have serious implications for universities in developing countries. Just as university students were fast to discover community-college online options, students in developing countries will recognize the benefits of online foreign degrees, especially if the students wish to emigrate.

The critical need for change is obvious. The challenge is to find solution to the barriers that block change.

Faculty Barriers

Table 2 lists common faculty concerns about eLearning. Many of these concerns have been addressed in studies and by accrediting agencies. While valid concerns continue, eLearning is here to stay, and it is an essential tool to meet the need for skill workers in the technological world of today. In regard to question of student-teacher separation, the blended mix of student-centered eLearning, face-to-face sessions, and audio/video Web communication address this issue. My personal experience has been that teachers can form stronger and longer lasting bonds with eStudents compared to lecture-based courses.

Table 2. Faculty obstacles to online learning

Obstacle
<ul style="list-style-type: none">• Academic<ul style="list-style-type: none">○ Course quality○ Separation from students○ Student centered teaching○ Acceptance of online degrees • Technology<ul style="list-style-type: none">○ Poor computer skills○ Online luddite○ Fear that students have better tech skills • Professional<ul style="list-style-type: none">○ Class size○ Recognition and remuneration○ Time: Course development, teaching○ Teaching load○ Time from research○ Policies and procedures

Almost all the academic obstacles—course quality, separation, and instructional methods—have been addressed. The curriculum is available on the course web site and the instruction is recorded. The student centered teaching approach is now common throughout North America and many teachers prefer it. However, in the Pacific, faculty isolation from educational innovation and a tendency to view change as Western imposition must be addressed. One solution is to provide training. The remaining academic problem is acceptance of online degrees (Adams, 2008). However, the solution is simple. Provide academic programs with a mix of face-to-face and eCourses. Most critics are not opposed to online courses, just online degrees.

The technological barriers are mostly age-related. Older faculty who did not grow up with computers and the Internet may have limited computer skills and use the Internet as a learning tool. There are two solutions to this problem. First, provide technology training and partner teachers with technology mentors. This helps overcome the fears of handling the technology in front of student technophiles. For the aged luddites, the best solution is to consign them to the podium. Often, the best way to convince doubters is by success.

Administrative Barriers

According to Davis and Batkin (1994), most organizations change only when forced to. The global economic meltdown is definitely a force for change. However, for change to take place administrators must be open to change and they must create an organizational strategic plan to implement the innovation (Toffler, 1985). Without the administrators who are leaders with a vision and plan, universities will resist change. Even if an organization has such leaders,

politics, culture, and other forces may still make change impossible (Christensen, Horn, & Johnson, 2008). In the quest to develop eLearning universities may face a variety of barriers.

One barrier to change is *past thinking*—“We tried that 30 years ago.” Another barrier is *contempt prior to investigation*—“It is not the South Pacific Way.” A third barrier to change is *top-down* administration in which only ideas that come from the top are valued. As Deakin and Batkin point out, mid-level managers are the key to change. The fourth barrier is *the last mile*, which refers to failure operationalize strategic plans with benchmarks and completion dates. Just as not all faculty are suitable to be eTeachers, so too some academic intuitions may be unable to change. The following are barriers to change.

Class Size

Large classes are cost-effective and faculty loads are based upon enrollment and number of courses. The problem is that eLearning requires smaller class size to promote retention and encourage critical thinking and team learning (Kanuka, 2002). To move to online learning will require a class-size mind shift.

Recognition and Remuneration

Online teaching takes more work than face to face—about 3x as much. The challenge for administrators is to implement new approaches that take into account the teaching load, time from research, and credit toward promotion and tenure.

Student Services

The successful for-profit universities have developed online registration, counseling, career guidance, etc. All these services require technical expertise, significant financial investment, and a willingness to change the traditional face-to-face practices

Technological Infrastructure

A university must ascertain if it has sufficient resources to implement eLearning. The cost is significant, and it may be better to contract out to other online providers. It is better not to offer eCourses than to offer poor ones. Unlike a face-to-face courses, student criticism of online courses spreads online. With a press of the *send button*, complaints about online courses can go global.

Interdepartmental Cooperation

To be success, an online program needs not only the academic departments, but also student services, human resources, finance, media, and administration working toward a common goal. In departmental cooperation is the first step. Next, all involved must be flexible to revise policies and procedures as needed for the online operations.

Management Style

The secret to success of the for-profit universities is a management style that adopts a business model. These organizations implemented a management approach that enabled them to identify new markets, conceptual new products to meet the customer need, and produce the product quickly. Ask yourself if this is how your university operates?

In order to adopt a business model, the managerial philosophy must be outcome oriented, entrepreneurial, and willing to take risk. Moreover, since change is implemented by mid-level managers, they must be empowered to make decision, act quickly, and take risk. Mistakes will be made and administrators must establish a work climate that does not stifle innovation. The extent of this *management rethink* will determine the extent to which it can adopt a business approach.

DISCUSSION

eLearning has become a worldwide phenomenon in the new technological economy, crossing oceans and reaching to remote villages. The entry visa for eLearning is a computer and an Internet connection. Not long ago, a university's competition was local. Now it is global. University of Phoenix (US), University of the West Indies (Trinidad & Tobago), and University of the South Pacific (Fiji), are engaged in a global competition to attract and retain students.

At the university level, many first went online to protect their enrollment. Now, the global economic turmoil requires eLearning to provide the nation. Each country must educate their citizens to become the skilled workers needed to compete in the global market. Every country needs to graduate a greater proportion of the population from high school, university, and graduate school. Lifelong learning, professional development, and up skilling are keys to economic success in a technological world

The eLearning approach demonstrated in the course *ChemOnline* is one cost effective way to expand the educational access needed to meet this challenge.

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