The Future of e-Learning:

A Corporate and an Academic Perspective

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Abstract

E-learning is here to stay as the fast changing pace of technology, the shortening product development cycles, lack of skilled personnel, competitive global economy, the shift from the industrial to the knowledge era, the migration towards a value chain integration and the extended enterprise (Mcrea, Gay & Bacon, 2000), fuel it's strategic importance and realization. This study revealed that indeed e-learning could become the major form of training and development in organizations as technologies will improve to create a fully interactive and humanized learning environment.

Introduction

Economic, social and technological forces have and continue to change the global economy, and the way of life in organizations and the world. The Internet and associated technologies have spurred evolutionary business processes in organizations. Where the corporate homepage was once the 'thing' to have, today's organizations have progressed from the homepage to the intranet to e-commerce. There are some organizations that have moved forward into e-business and there are still others that have just now started their e-enterprise. Earl (2000) saw e-enterprise moving into what he called, "the transformation stage". The transformation stage, Earl related, is the acid test of organizations not only being comfortable in the new economy, but also being able to build a capability for continuous innovation and renewal – even reinvention. The critical success factor in transforming being building an organization where everyone takes responsibility for continuous learning and change.

E-Learning interventions are rapidly becoming organizations' response to continuous learning and change in the new economy. Today, organizations are in synch with and using content providers, authoring tools, training management systems, portals, delivery systems and integrated solutions (Hall, 2000; Domingo, 1999; Barron, 2000abc) to foster their e-Learning endeavors. This is important because as companies digitally transform their businesses, knowledge and training become rapidly obsolete, just-in-time

training becomes a basic survival need, and identification of cost-effective ways of reaching a diverse global workforce becomes critical. The skills gap and demographic changes heighten the need for new learning models while flexible access to lifelong learning is highly desired (Urdan & Weggen, 2000). E-Learning further gains strategic prominence as companies need to manage organizational competency, provide employees with competency roadmaps, distribute latent knowledge within the organization, align business objectives and learning outcomes, and extend learning to value chain partners (Mcrea, Gay & Bacon, 2000). The need to validate outcomes directly with increased ROI, provide on-demand task related resources, rationalize duplicative training, and reduce delivery costs and increase organizational efficiency also heighten the strategic viability of e-Learning (Mcrea, Gay and Bacon, 2000).

The Internet and its distributive architecture will, for the first time, give corporations the power to combine a series of discrete, unlinked and unmeasured activities into an enterprise-wide process of continuous and globally distributed learning that directly links business goals and individual learning outcomes (Mcrea, Gay and Bacon, 2000). Several factors subsidize the power of the Internet and its distributive architecture. First, Internet access is becoming a given at home and work. Second, the advances in digital technologies have and continue to enrich the interactivity and media content of the web. Third, increasing bandwidth and better delivery platforms make e-Learning feasible and attractive. Fourth, a growing selection of high quality e-Learning products and services such as content providers, authoring tools, training management systems, portals, delivery systems and integrated solutions are now available. Lastly,

technology standards, which facilitate compatibility and usability of e-learning products, are emerging.

Purpose of the Study

The purpose of this study was to identify the future of e-Learning from an academic and corporate perspective. E-learning is here to stay as the fast changing pace of technology, the shortening product development cycles, lack of skilled personnel, competitive global economy, the shift from the industrial to the knowledge era, the migration towards a value chain integration and the extended enterprise (Mcrea, Gay & Bacon, 2000), fuel it's strategic importance and realization. With e-business being an evolutionary process (Ticoll, Lowy & Kalakota, 1998; Earl, 2000), and with e-learning, a rapid, effective and less expensive form of training and development (Schutte, 1996, Magalhaes & Schiel, 1999, Karon, 2000), being a response to this new economy evolutionary processes, it is imperative to look at the future of e-Learning. What will e-Learning look like in the next five to ten years? Answers that could help guide strategic decisions on e-learning.

Definition

While the e-Learning researchers at the National Center for Supercomputing Applications (NCSA) of the University of Illinois, Champaign-Urbana campus, use the term 'e-Learning' in this study, terms such as web-based learning, online learning, technology-based learning, and distributed learning are synonymous to 'e-Learning'. For the purpose of this study, the researchers defined e-Learning as the acquisition and use of knowledge distributed and facilitated primarily by electronic means. This form of learning currently depends on networks and computers but will likely evolve into systems consisting of a variety of channels (e.g., wireless, satellite), and technologies (e.g.,

cellular phones, PDA's) as they are developed and adopted. E-Learning can take the form of courses as well as modules and smaller learning objects. E-Learning may incorporate synchronous or asynchronous access and may be distributed geographically with varied limits of time.

Procedures

E-Learning researchers at the National Center for Supercomputing Applications (NCSA) at the University of Illinois, Champaign-Urbana campus, attempted to get academic and corporate insights on e-Learning's future in the next five to ten years. This was a descriptive and exploratory study. The major data collection method was two two-hour scenario-building sessions.

Scenario building is a disciplined method for imagining possible futures. Scenario building attempts to capture the richness and range of possibilities, stimulating decision makers to consider changes they would otherwise ignore (Schoemaker, 1995). Scenario building provides an easy-to-introduce and value-added passageway toward becoming a learning organization (Thomas, 1994).

The first session focused on both corporate and academic professionals while the second included only academic professionals

The First Scenario-Building Session

The first scenario-building session was held on April 19, 2000 at the Radisson Hotel, in Champaign, Illinois in conjunction with the annual meeting of NCSA corporate partners. The goal of this e-Learning session was to explore how corporate education and training personnel viewed the future of e-Learning and how well they viewed themselves as being positioned for various possible future scenarios. Participants included fourteen training professionals representing Allstate, Caterpillar, Eastman Kodak and Motorola,

seven NCSA researchers, and five professors from the University of Illinois. Participants in groups of five participated in four activities in order to produce an entitled scenario. The four activities were:

Brainstorming: Identify a set of possible future events that may occur which would impact corporate training methods, processes, and technologies.

Clustering: Identify a set of maximally different futures each composed of a set of future events that are likely to co-occur.

Scenario description and trigger identification: Create a scenario and identify trigger events that would indicate that this scenario seemed likely to occur.

Strategy assessment: Participants regrouped by company to identify the scenarios for which their company was most and least prepared.

The Second Scenario Building Session

The second session was held on August 21, 2000 at the Fox Drive Building of NCSA, Champaign, Illinois. Participants included sixteen professors and five technology specialists from fifteen disciplines at the University of Illinois. These disciplines included: engineering, chemistry, library science, speech communication, business and education. Similar to the corporate e-Learning session, participants worked in groups of five. In contrast to the first e-Learning session, however, participants were not given specific activities. They were asked to ignore the existing technological limitations, to choose their scenario perspective and entitle their scenarios. A tape recorder was used to record the entire group discussion.

Data Analysis

The scenario building process was different between the sessions therefore; the scenarios are presented in different formats. The first session scenarios are organized

under two major headings; they are: Major Events and Scenario Description. The second scenarios are presented in a narrative form. All the scenarios are presented in their original format as they represent the first level of major findings.

To further understand what the scenarios were concertedly telling about the future of e-Learning in the next five to ten years, recurrent themes between the corporate and academic scenarios were compared. Recurrent themes were identified by content analyzing the scenarios for macro, industry, organizational and market forces. Macro forces focus on changes in the social, technological, economic, environmental, educational and political sectors. Industry forces comprise of all problems and developments associated with e-Learning infrastructure. Organizational refers to internal organizational issues affecting e-Learning. Market refers to all types and characteristics of e-learning customers (Peterson, Dill, Mets & Associates, 1997).

Additional analysis was done to the first session scenarios, as participants from that session were asked to regroup by company and asked to review all the scenarios that were developed in that session and identify which scenarios their company were most and least prepared for, and which scenarios were most likely and least likely to occur in their future.

Results

The results of this study are organized in four sections. The first section presents the corporate scenarios. The second section looks at which corporate scenarios the companies representatives thought their companies were most and least prepared for, and which scenarios were most and least likely to occur. The third section looks at the academic scenarios. Lastly, a summary of the most recurrent themes between the corporate and academic scenarios is presented.

First Session Scenarios

Five scenarios were identified. They were entitled: e-Work, Free Agent, Unlimited Bandwidth, Gloom & Doom, and e-Topia.

Corporate Scenario #1: e-Work

Major Events

- Everyone has a computer and is networked.
- Robots do physical work or construction.
- Home and worked are merged - no distinction.
- It does not matter when you work, as long as the job gets done.
- There are high levels of electronic skills immediately applicable to the job.
- University provides core skills or business provides its own university.
- Time in school varies based on job requirements.
- Hire out of high school.
- True knowledge worker society
- Rural communities thrive
- More family time
- Less chances of war
- Undeveloped economies are "out of the game"
- World currency. No physical currency
- No corporate buildings
- All knowledge and training functions outsourced
- 100% of company telecommutes

Scenario Description:

- Global work force
- World competition
- There is no, or very little management.
- Employees ownership.
- Employee works for multiple companies.
- Hyper-competition: Competition for employees, among companies, cost effective operations
- Effective enabling technology
- Enhanced robotics industry
- 50% of things are purchased on-line
- Flexible work schedules.
- Shortage of trained people
- Increased outsourcing of core operation
- You're outsourcing your outsourcing
- Traffic jams make travel impossible
- Fuel shortages, cost of fuel
- Childcare shortages
- Car sales drop dramatically
- Office buildings become vacant
- Downtowns disintegrate
- Increase in home delivery businesses and sales

Corporate Scenario # 2: Free Agent

Major Events:

- Degreed education and job education merge
  - Employees paid for their learning
  - Everyone is a trainer
- Flattened organizational structures
  - No career paths
  - Many people are free agents (don't work for companies)
- No salaries
  - Individuals charge to share information

Scenario Description:

- Training is "pull" model rather than "push"
  - Smorgasbord of training modules

- Individualized professional structure (rather than corporate)
  - To be successful one must be a self-starter
  - Primary motivation becomes money
  - Power is only realized via placement of your money

- Changing personal values, No buy in to corporate mission
  - Buy in to a world mission? No, looking out for yourself
  - Everyone only interested in immediate personal gain
  - No identification with corporate goals, no common goals
- Changing corporate values, No loyalty to the employee
- More leisure time
  - Art and self-development flourishes
  - Everyone sings
- Increased outsourcing of critical activities
- Middle management being fired (or not replaced upon retirement)
- Continued expansion of neo-liberal laissez faire capitalism
- Self directed goals, work, and performance assessment for employees
- Responsibility for education, training (including choice of training) shifting to employees
- Companies merge, and there is a need to adapt to a new culture
- Profiling of employees – skill brokering

Corporate Scenario #3: Unlimited Bandwidth

Major Events:

- Super help screen that works
- Reference librarian on desktop
- Intelligent appliances
- Real time complete 2-way communication with customer
- Unlimited Bandwidth
- All multi-media info is online
- Wireless everything
- Loss of real FTF interactions
- Holograms
- No more proprietary information
- No HS drop-outs
- Everyone gets A's
- Drugs that aid learning
- Computer brain implant
- Mental telepathy
- Maintain high-capacity of brain cells

Scenario Description:

In the future, unlimited bandwidth will be the catalyst for many technological developments. We can see all multimedia online and use all types of wireless products, including wireless computer glasses and sensors on our feet so we won't trip.

The availability of the above allows for such developments as the super help screen and wireless reference librarian. Intelligence objects, such as a TV that gives you suggestions of what to watch, based on what you have watched in the past, connects you to the reference librarian for more information. All information is publicly available via the librarian. An example of 2-way communication with customers is being able to buy that pizza in the commercial by voice activated communication inside the television.

After five to ten years, these technologies are not used as much. The computer implants drugs that contain learning, such as a MS Word pill, and mental telepathy will be available. Also, holograms will replace the need of an online reference library, making everyone (dead or alive) able to be experts to as many people around the world, simultaneously. You could even have multiple simultaneous sessions that are instantaneously downloaded to your brain implant.

This makes schools, as we know it, obsolete. At three years old, you can take a pill and know how to read and write.

Corporate Scenario #4: Gloom and Doom

Major Events:

- World Economy Collapses
  - GATT is not renewed: start seeing tariffs
  - European currencies collapse, our businesses must do business with multiple currencies: currency speculation increases and more wealth goes into that than improving people's lives
  - Poorer nations become poorer: We lose profits because we have less business in underdeveloped nations.

- Internet Collapses
  - Employees complain about the slowness of the Network. Employees are not able to perform as effectively because they do not have the optimal learning tools.
  - Increase us of private network: decrease amount of resources you have access too----loss of information, ultimately, a loss of efficiency, which is really a loss of profitability—bottom line: our company's are losing money
  - Because of less electronic usage—less networking with individuals you primarily communicate only because of electronic means
  - Move away from online shopping and banking—this leads into time that is taken away from the company or to do personal errands.

- I-War
  - Cooperation between nations disappear: Every nation for themselves
  - Increase in Internet viruses
  - Increase in hackers and denial of service

- Employees refuse online learning
  - Instructional led training increases, a shortage of trainers
  - Paper-based systems must be implemented
  - High increase in medical costs because of carpal tunnel and/or vision strain
  - Decrease of individuals receiving professional degrees: less profits for our Companies

Scenario Description

- French refuse online training
- Denial of Service
- Confidential information 'leaked out' on the Internet
- Security Concerns
- 'Hackers' disrupt
- Currency de-valuations
- Internet com

- Nationalism
- Internet companies die, not making any money
- Breakdown of network
- Border Conflicts: CIS
- Spread of computer viruses over the Internet
- Epidemic of Carpal Tunnel and vision problems because of eye strain

Corporate Scenario #5: e-Topia

Major Events:

- Transporters
- Universal instantaneous language translation
- Homogeneous culture
- No legal community
- One company per industry
- Everyone loves everyone else
- First time travel agency opens
- Nobel Prize For Nan technology awarded to a team of undersea neuroscientists
- New course on terra-culture offered at Holo-U
- World and orbiting space station celebration of 300 years of peace
- Eastwoman-Kodak makes available art holograms for your home-have dinner with Mona Lisa.
- Global Museum features pre-Etopian culture; highlighted exhibit is the 'The last lawyer on Terra'

Scenario Description:

Events and discoveries in science and neuroscience has caused such a great leveling and growth of human abilities/capabilities, there is not as much need to compete with one another. Wars have ceased and wealth has been redistributed because technology has created the availability of unparalleled abundance of goods and services. Traditional transportation needs no longer exist because of new discoveries in physics, and transporters change matter to energy allowing for instant transport of anything anywhere in the world.

Legal community and the political arena have been replaced by an interdependent team of experts in each area of human knowledge. Racial and ethnic divisions have blended. Everyone has an equal opportunity to access education/learning opportunities via virtual intracranial knowledge exchange. There is universal instantaneous language translation (though-transference), which eliminates misunderstandings through the spoken word. Because of this, traditional human interactions are undergoing a vast change, and body language becomes much more expressive.

Nationalism has ceased; human endeavors replace the traditional definition of commerce and industry. There is a societal focus on self-actualization and independent thought. Emphasis is on the development of the whole human; technology is de-emphasized (because it is so advanced) and creativity is central to human existence. True global shared value system; the world culture is defined by the scope of human activities; not jobs, wealth or status, but by the level of expertise and how much knowledge people have amassed and shared with others.

Reactions to Corporate Scenarios

As mentioned before in the first session, the corporate participants were asked to vote on which scenario their company was most and least prepared for and which

scenario was most and least likely to occur in the future. The table below shows how many participants voted for each of these categories.

Scenario	**Which scenario is your company <u>most</u> prepared for?**	**Which scenario is your company <u>least</u> prepared for?**	**Which scenario is <u>most</u> likely to occur in the future?**	**Which scenario is <u>least</u> likely to occur in the future?**
e-Work	2	1	10	-
Free Agent	6	-	2	-
Unlimited Bandwidth	4	-	6	2
Gloom & Doom	1	12	-	7
e-Topia	None but we like it	3	-	9

Participants believed their companies were more prepared for the 'e-Work,' 'Unlimited Bandwidth,' and "Free Agent' scenarios. Participants thought that their companies were least prepared for 'Gloom and Doom' and 'e-Topia'. Overall, the scenarios depicted the present and possible future of corporate training environments given possible internal and external economic, technological, environmental, political, cultural, and social changes.

Second Session Scenarios

Four scenarios were developed. The scenarios were entitled: A Day in the Life of a Learner, Pie in the Sky, The Importance of Socialization in e-Learning, and Ubiquitous e-Learning

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Academic Scenario #1: A Day in the Life of a Learner (or Person)

In the future, the term e-Learning may be obsolete because technology will appear invisible to both the learner and instructor. They will be working in a technology-rich environment, but the environment will not be a focal point. For example, we drive a car

and take for granted the way it runs. The new environment will include holograms to represent each object, whether the object is a person, a learning object, or a communication tool. This system will have built-in intelligent support.

There will be several levels of support. Besides the already mentioned embedded support, there might be virtual support centers, as well as physical support centers, available in learning centers.

These learning centers will be located in close proximity, similar to the current Community Colleges districts. Although attending learning centers will not be necessary, they will provide for social interaction and optional face-to-face classes and meetings. The staff of a learning center would include coaches and mentors to direct and facilitate quizzing. This will prohibit students from cheating.

In five to ten years, the lines between learning and working or doing will be blurred. Students may not even identify themselves as students because the act of learning will be so much a part of their work and everyday life. Instead of taking fixed length classes, people will go to the plentiful variety of resources to solve a problem (i.e. certification courses). Each person will be in charge of his/her own learning plan, but may be able to use high school standards and requirements to help direct their paths. Instead of semester classes, the problem-based sessions could be short learning objects, modules, or work groups that could jointly accomplish a task.

The professor's role will be changed from a deliverer to a facilitator or manager. There will probably even be a less number of professors, replaced by new roles such as the Web Technology Group, instructional designers, and other roles that do not yet exist.

Because a professor's time will be less spent on administrative tasks, they will have more time to think and more time to acquire and share knowledge. This will motivate knowledge sharing. Likewise, by using a micro-charging system, where the professor receives a small fee automatically every time a learning object written by him/her is used, would also promote knowledge sharing.

The organization of learning will also evolve. The learning centers will replace universities and the public school systems. A fifth grader, an adult learner, and university students could all be in the same class. Barriers, such as languages and departments, will be non-existent. Finally, within all of these changes, the traditional grading system will not be needed. While there may be certification programs, there will be other ways, including portfolios, to assess a learner's capability.

Academic Scenario #2: Pie in the Sky

You can have your pie but you have to go high into the sky to get it. Imagining things that probably won't happen – we have to dream about it! It must have been the same before airplanes came about. Where do we want to be? We want to be high in sky but with some realism. How will faculty deal with e-Learning in five to ten years?

First, we are going to be less and less reliant on standard textbooks and more reliant on electronic textbooks. Learning materials are going to be highly interactive, entertaining, three-dimensional and much more powerful! These e-books will not have a print option, because students will have better resolution and a wonderful screen to read from. E-books will be portable, lightweight devices that will be attachable to any computer. These e-books will be able to interact with course content and promote multiple learning styles. Online assessment will also be a characteristic of these e-books.

Because these books will be initially expensive to produce, the e-books will be developed by commercial vendors in collaboration with professors.

A live online lecture would respond to students' abilities and what students are learning from the e-books. Students will orchestrate and manipulate the material. Students will be able to try out things and get immediate feedback on what they are doing. E-books will support any discipline and incorporate multiple levels of intelligence. An asynchronous lecture will be hyper linked, indexed, and treated as a reference. Courses will be integrated and interactivity among courses and programs will be seamless.

It will continue to be important to value team learning and different learning styles and strategies. Online teams will be able to see and hear each other. Better speech recognition software will enable students to interact orally and instantly and be less dependent on typing.

Faculty will have a new set of teaching skills; that is, how to teach online. Professors will also have better technology skills. As e-Learning scales up, infrastructure to support e-Learning will become the norm. Professors will be valued and encourage to continue e-Teaching. Collaboration among professors and different institutions will also continue to increase. Professors will also become more accountable to doing post assessments of students and programs. Professors will be doing more life-Learning teaching on campus. Re-certification will occur on a regular basis.

Instructors will also be closely connected with the students. If the students feel they have access to the instructors, can get their questions answered, and receive good

feedback and responses, students will feel like they are learning the material. Online interaction between the students and instructors will become absolutely essential.

And what about our students? What will they look like in 5-10 years? Some students will be older, but most will be typical high school graduates. These students will be consumers of e-Learning and will be more computer savvy.

Academic Scenario #3: The Importance of Socialization in e-Learning

The future of e-Learning forces us to evaluate the way it will impact the relationships we develop and maintain. We can look at it from three perspectives: the technological context, the human context, and the environmental context.

From a technological context, better technologies will allow more humanization. In specific, there will be better voice recognition, bigger video screens, and improved portability and access. Perhaps, most importantly, the video will be seamless and thus, the interactions will really be in real time. The videos will also proximate normal size. In total, these changes will be able to replace the traditional classroom with minimal deficiencies, if any.

Speaking in terms of human context, future technology appears to have some potential barriers. For example, online has the tendency to be more individualistic. This will require more work from the instructors. In fact, the workloads will be high enough that they will demand educators to exceed the excessive amount of time they already devote to classroom instruction. This will ultimately interfere with the professors' capability to continue their research interests. Thus, there is the concern that the traditional faculty evaluation standards, based on research and publications, will be inappropriate. Additionally, to be able to make use of the advantages of technology, one

must develop ways of encouraging group learning. Interaction among online students provides for permanence (records) for sharing and collaborative learning. The question this raises, however, is "How do we deal with these interactions?"

A definite advantage of future online learning is that virtual classrooms will bring together a heterogeneous group, with complementary and diverse skills. This will be a great benefit to the students as they will be able to learn from diverse human resources and connect globally with experts in their field. This will without a doubt foster learning. This, however, will be student dependent. No matter their background or experiences, the students that will survive in e-Learning, will be independent and highly self-motivated learners. Currently, a student has the option to sit in a classroom and let their peers 'do the talking.' Such behavior might go unnoticed in a traditional lecture setting. In the online learning environment, students do not have this option. The students will have to participate. This could be a challenge for future generations. We will have to teach them that learning is a lifetime profession that does not end with a certified document.

Finally, from an environmental context, e-Learning once again raises several issues. We believe that it will still be necessary to hold at least one face-to-face meeting prior to the beginning of the online learning session. Even in the era of technology, there is still a human need to build a foundation that will establish trust and make people feel comfortable with one another. It may also make sense to build small schools within schools. Analogous to learning communities, individuals with similar interests can meet to discuss and share knowledge.

Sharing of knowledge will extend beyond individuals within one's home campus. For example, learners will have the freedom to take courses from other universities. What will this freedom mean to the future of University campuses? At this time, it seems irrational to believe that in five to ten years, campus universities will lose their presence. Students are still going to prefer to be onsite for their learning, yet for those that are learning at a distance, they will not be at any disadvantage. Those students outside of the physical learning site will have an experience that is identical to those sitting in classrooms. Now that would be the ultimate!

Academic Scenario #4: Ubiquitous e-Learning

We view e-Learning as a continuum where on one end you have just a minor enhancement of traditional teaching. You have perhaps a Web Board, or you put the syllabus online. This is the first step. The far end would be then where we'd like e-Learning to be one day. It's fully online, interactive, time and place independent. E-Learning will take complete advantage of the technologies of the web. Therefore, there will not be any streaming video that simply shows a professor lecturing from a traditional classroom. We will take full advantage of an integrated, dynamic computer system, that allows for knowledge hierarchies. It seems like most online learning falls somewhere on that continuum.

Research findings show that in order to be effective, virtual teams need to meet at least one time in the initial stages of the course's development. We don't necessarily agree. We want future technologies to replace co-locating in the future. Furthermore, groups typically gain process knowledge as opposed to content knowledge, and the

process used in decision-making is just as important as the outcome. E-Learning will have to accommodate both forms of learning.

Currently, none of us at universities have the best people for every topic. What do we do? We put a reading packet together with experts from the field. This is a low level technology that allows us to compile the best articles by ten different people. However, you don't normally have a guest speaker come in for each section. Why? Because the coordination cost is incredibly high. E-Learning enables us at a micro-module level to connect to these experts through the web, instead of taking entire courses. This is another example of reconfiguration.

Sociological issues surrounding e-Learning are just as difficult, if not more difficult, than some of the technological issues. For example, in management there is a current uproar because academic faculty and training professionals are reluctant to have their intellectual property be recorded on some type of permanent document that then can be used indefinitely. This creates a real dilemma over who is the owner of intellectual property. Until we resolve some of these issues, e-Learning will in fact evolve slowly.

How will we motivate people to contribute knowledge to e-Learning? Some organizations will offer incentives similar to frequent flyer mileage for each time someone publishes or retrieves information from the collective databases. An issue related to this knowledge publishing is the credentialing of information to ensure its quality. Technologies need to be developed to address this collective action issue, "Why should I, along with others, contribute to a collective good?"

An important consideration for academia is the effects of e-Learning on faculty. It will destroy the competencies needed for a traditional professor who, as an expert,

verbally transfers knowledge to students in a classroom setting. Thus, e-Learning will change the career of a faculty professor. There may be two tiers of people: those focused on research, and those focused on teaching. Similar to how automation entered factory production, technology will enter education. Furthermore, universities will have to increase their e-Learning course offerings to be competitive with private sector companies offering accredited online degrees.

Certain student characteristics are more conducive to e-Learning. People with a high degree of curiosity, openness to new experiences, self-directed, and comfortable with an ill-structured environment, will thrive. Thus, people who need more structure will find this new learning environment more challenging. These characteristics are important in both an academic and corporate environment. This highlights a new skill for e-Learning students and facilitators. This skill is collaboration fluency and differs from communication fluency. E-Learning will help develop collaborative fluency as it will become a critical skill to possess, in order to succeed in tomorrow's world.

The standards being developed in the private sector in terms of creating modules is helping achieve ubiquitous e-Learning. Along the way someone gets paid for creating the modules, someone else for storing the modules, and so on and so forth. Cisco Systems is doing this now with individualized courses tailored to individual needs. At the university level, this isn't happening, but needs to. For example, we have dozens of online efforts on campus each proceeding at their own rate, developing their own standards.

Learning modules developed by standards are customized for anytime, anywhere learning. We would also like to see something being done for creating on-the-fly

collaborative learning environments. Will we be able to go on the web and say, "Is anyone in the world interested in doing something on "Topic X"?

We look forward to new technologies such as virtual reality simulations, with relatively complex scenarios for experiential learning. Students will be able to do case studies by actually being participants, instead of reading about it. It will also be used for expert mentoring, such as on how to operate a complex machine or other procedural tasks.

Finally, we anticipate the use of wireless devices as integrated learning mechanisms. For example, in a museum, one would be able to stand with a PDA, and using GPS technology, would be able to learn about the piece of art that is facing him/her, and depending on whether one turns left or right, the PDA would track their movements and compare the two pieces of artwork (the one previously looked at to the one that the individual is now standing in front of). In other words, technology will create scenarios on the fly, from different experiences based on where you are. E-Learning will integrate the whole notion of location independence without being tied to a keyboard or monitor.

Summary of the Scenarios

The identification of recurrent themes across the corporate and academic scenarios garnered nine major conclusions about e-Learning's future in the next five to ten years.

First, advances in e-Learning technologies will continue to occur. These advances will be wireless, highly intelligent, interactive and integrative, accessible and easy to use.

Second, e-Learning technologies will allow for a humanized learning environment. E-Learning , for example, will integrate the whole notion of location independence without being tied to a keyboard or monitor. Online teams will be able to see and hear each other in real time on enlarged computer screens that will have high resolution.

Third, e-learning will become a 'matter of fact' because e-Learning will become so much a part of what we do and learn; the lines between doing and learning will become blur. E-Learning and its technologies, then, will not be discussed as much.

Fourth, as e-Learning takes prominence in organizations, organizational structures will continue to flatten, management levels will continue to decrease, outsourcing will continue to increase and telecommuting will become a norm in the organizational culture.

Fifth, e-learning infrastructure will be responsive to learner diversity. This diversity will extend but not be exclusive to age, nationality, ethnicity, educational background, intelligence levels, learning styles, language and learners' needs.

Sixth, e-Learning customers will be self-directed, operate on flextime, be technologically savvy, have high collaborative fluency and be intrinsically motivated to pursue life-long learning.

Seventh, e-Learning was also seen as a possible threat to collaborative work, because of issues such as intellectual property, everyone becoming interested in personal gain, and security concerns.

Eighth, global partnerships between corporate and academics will increase because e-Learning infrastructure will be so versatile and integrative that it will facilitate

quick connection, decrease coordination cost, broaden the level and variety of resources, address short-term and long-term needs, and have immediate impact on the job.

Lastly, e-Learning will not operate on traditional norms of what a standard education is, rather e-learning will be about meeting the learner's needs for improved performance. This may not be taking full length classes across a semester, rather it may include but not be exclusive to problem-based scenarios, interactive case studies, virtual reality simulations, e-books, short learning objects, modules or projects. Thus, getting an engineering degree might not be the solution to becoming a successful, skilled engineer.

Conclusion

Both the corporate and academic scenarios, both in their process and products, can serve as an environmental scan resource to help envision an organization's strategic approach to e-Learning in the next five to ten years. In addition, both the academic and corporate representation provides a more in-depth perspective on the direction of e-Learning. While these scenarios are limited to the perceptions of the participants, the participants represent two major e-Learning playing fields. As the corporate and academic worlds pursue e-learning, a look into the future is inevitable. This study provides a beginning to that insight.

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