

The Emergence of the Field of E-learning

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Introduction

E-learning as we know it has been around for about 15 years. During that time, it has emerged from being a radical idea to something that is ubiquitous. It is now a part of many businesses, and a service offered by most colleges and universities. It has been heralded as a means that allows us to learn anything, anytime and anywhere (Downes, 2005).

E-learning is a generic term used to describe electronic technologies and learning on the web. Early definitions were technology-driven, typically referring to the use of computers and the internet to deliver a learning experience. Jay Cross, acclaimed e-learning coach who invented the term looked at what “was” and what “is” e-learning (Cross, 2004). In 1998 he stated that: E-Learning is learning on Internet Time, the convergence of learning and networks.

Later definition introduced an often overlooked element that is critical for e-learning to be successful. The important distinction is the emphasis on the learning experience. This is particularly important since it recognizes the instructional design aspect of e-learning. As Cross (2004) points out in what “is” e-learning,



Image: The Gartner Hype Cycle (Source: Wikipedia)

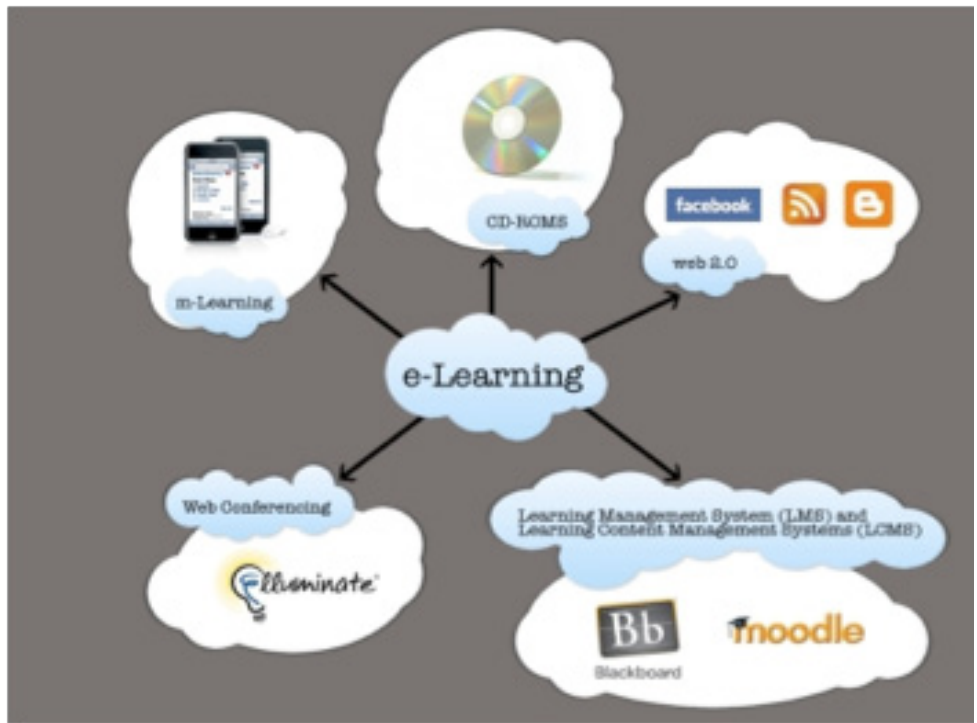


Image: Retrieved from <http://www.mobl21.com/blog/17/mobile-learning-and-how-it-relates-or-differentiates-from-e-learning/>

ing, the “e” doesn’t matter because it is the learning that counts. Accordingly, newer definitions emphasize this: E-learning is the use of electronic technologies to create learning experiences (Horton, 2012).

Although e-learning has developed at a rapid pace with high expectations, overall it has been met with mixed success. The over emphasis on technological aspects has been a large reason. Rapid development and high expectations does not mean that implementation is intuitive. Currently experts believe we are entering the plateau of productivity of Gartner’s Hype Cycle with respect to e-learning.

As a relatively new field, e-learning is still evolving with many fields influencing its scope, essence and direction. Since we must study the past if you would define the future (Confucius), this paper will review the historical roots of e-learning followed by a discussion on the current and future state of this emerging and potentially transformative field.

Roots/Origins of E-learning

E-learning has its roots in three major fields, Instructional Media, Instructional Design and Distance Education.



Instructional Media School Museums

In 1905, school museums came into existence with the first opening in St. Louis. Portable exhibits of stenographs, slides, films, charts and other instructional materials were available to schools. Teachers could use these materials to supplement the curriculum (Reiser, 2001).

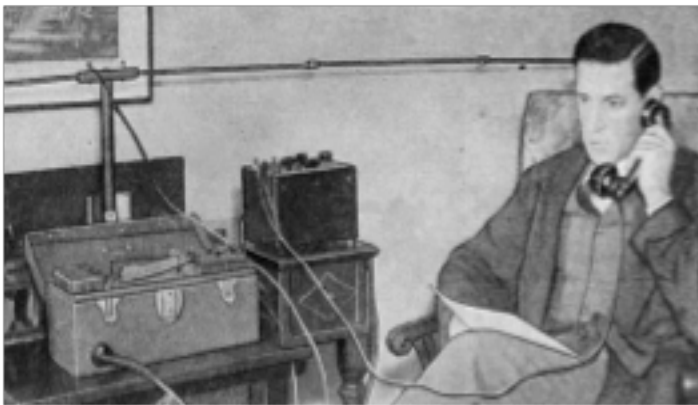
(1905). [Image of photograph]. Chicago, Illinois; Chicago History Museum. Retrieved February 9, 2013, from Chicago Daily News negatives collection (0002736).

Instructional Films

In 1913, Thomas Edison proclaimed that: “Books will be soon obsolete in schools...It is possible to teach every branch of human knowledge with the motion picture. Our school system will be completely changed in the next ten years” (cited in Reiser, 2001, p. 55). Of course, these predictions were never realized to their fullest potential; however, visual instruction did grow.



(1925). [Image of photograph]. Washington, D.C., United States; Library of Congress Prints and Photographs Division. Retrieved February 9, 2013, from Library of Congress (LC-DIG-npcc-14348).



Instructional Radio

The growth of radio broadcasting, sound recordings and sound motion pictures through the 1930’s continued the interest in instructional media. Despite the growth of the field even throughout the Great Depression, the impact on education was not significant. However, many educators noted that audiovisual material was valuable for their ability to present concepts in concrete manner.

(2012). [Image of photograph]. Washington, D.C., United States; Smithsonian. Retrieved February 9, 2013, from <http://blogs.smithsonianmag.com/paleofuture/2012/05/predictions-for-educational-tv-in-the-1930s/>

World War II

The educational field has been shaped by the world around it. During World War II it became necessary to train large amounts of soldiers very quickly. Audiovisual instruction gained traction during the war with the United States Army Air Force producing over 400 training films and 600 filmstrips. Surveys revealed that these materials produced from 1943-1945 were effective training tools and reduced training time. Common devices of the time included overhead projectors, slide projectors (ex. ship and aircraft recognition) and audio equipment for teaching languages. The Division of Visual Aids Training was established in 1941, to oversee the training of the civilian workforce. This government agency produced 457 training films in an effort to reduce training time. The success of these films, both in the military and private sector created a renewed interest in audiovisual education in schools. (Reiser, 2001).



(1914). [Image of photograph]. Washington, D.C., United States; Library of Congress Prints and Photographs Division. Retrieved February 9, 2013, from Library of Congress Prints and Photographs Division (LC-DIG-ppms-ca-11404).

Post World War II

Given the success of audiovisual instruction during the war, research programs post World War II concentrated on identifying learning principles that could help design audiovisual materials training. When the Soviet Union launched Sputnik in 1957. Sputnik was the first man-made object to be put in earth's orbit. This began the "Space Race" in America, and brought with it a strong push in math and science education. Two federal had lasting impact on education and research, the passing of the National Defense Education Act (NDEA) and the establishment of NASA (Jolly, 2009). Millions of dollars were spent to develop science and math instructional materials. These materials showed very little success, which led educators to evaluate the method used in producing them. This was the beginning of the realization that instructional design must play a role in the development of new educational materials (Reiser, 2001).



(1945). [Image of photograph]. Washington, D.C., United States; American Treasures of the Library of Congress. Retrieved February 9, 2013, from Serial & Government Publications Division (68A.7).

Instructional Television



During the 1950's there was an extraordinary growth in instructional television. Federal and Ford Foundation funding sponsored closed circuit instructional television in grade schools and junior colleges. By the 1960's due to the mediocre quality of some of the instructional programs, interest waned. Most instructional television consisted of little more than a teacher lecturing and did not seem to meet the conditions necessary for adequate student learning. The launch of the satellite Telestar in 1962, heralded the beginning of the telecommunications revolution. Prior to 1962, educational television was limited based on broadcast capabilities. By the 1980's, many k-12 courses were being offered via satellite TV in foreign language, math, science. Many colleges and universities began broadcasting courses around the world (Saba, 2008).

(1954). Watch Mr. Wizard [Online video]. United States: NBC Television Network. Retrieved February 9, 2013, from http://archive.org/details/Yugi-Moto_likes-to_Fart

The Age of the Computer

Computer Assisted Instruction (CAI) was developed by IBM for use in public schools. Despite major efforts to encourage its use throughout the 1960s and 1970s, it generated little interest. When the microcomputer was introduced in the early 1980s it generated renewed interest in using the computer for instructional purposes. Excitement over this new technology was accompanied by enormous expectations that there would be radical changes in the education system. Although the growth of the presence of computers in the classroom was phenomenal, their impact on teaching practices was minimal. By the late 1990s, teachers reported using computers largely for drill and practice as well as word processing. This was hardly the educational revolution that was predicted. Another element that diminished its efficacy was the cost of such infrastructure. Despite the desire to use CAI systems, on average, schools possessed one computer to every nine students by 1995 (Office of Technology, 1995).



(2005). [Image of photograph]. Los Angeles, California; Cerritos College Campus Connection. Retrieved February 9, 2013, from <http://cms.cerritos.edu/connections-2005-3/10/10-03/october-3-6.htm>

Mobile Devices

This is the newest frontier in e-learning. It truly makes learning available anywhere and anytime. Students can learn outside the classroom whether they are at camp, the playground or a museum. According to the Pew Internet Project's 2011 teen survey, three quarters (77%) of teens have a cell phone (Lenhart, 2012). Pilot programs and research is in the early phases to determine whether mobile devices will prove to be a revolution in learning engagement, providing rich, active and collaborative learning experiences.



(2012). Philadelphia, Pennsylvania; Impact Internet Marketing. Retrieved February 9, 2013, from <http://impactinternetmarketing.com/search-engine-optimization/new-mobile-devices-on-the-way-the-future-of-the-web/>

Instructional Design

Instructional Design refers to the creation of “instructional experiences which make the acquisition of knowledge and skill more efficient, effective, and appealing” (Merrill, Drake, Lacy, Pratt & ID2_Research_Group, 1996). It is historically rooted in Cognitive, Behavioral and recently Constructivism, and Connectivism theories and has influenced thinking in the field of e-learning.

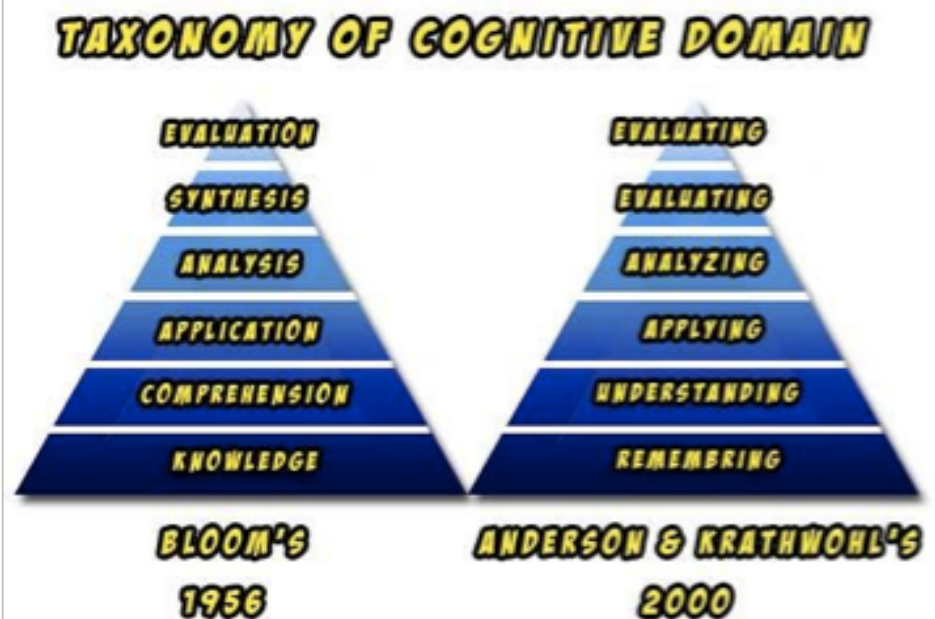
Cognitivism

In the early 1940s, educators were concerned with how students learned and the nature of thinking. In 1948, the Convention of American Psychology described learning as consisting of three domains: cognitive (knowledge based), affective (attitudinal based), and psychomotor (skills based). Bloom's Taxonomy, published in 1956, focuses on the cognitive domain. It breaks the cognitive domain into six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation. In the 1990's, Blooms model underwent a revision in terminology. In the revised Bloom's taxonomy (RBT), the six levels are now referred to as: remembering, understanding, applying, analyzing, evaluating, and creating. It is necessary to master each progressively more complex skill before moving on to the next level. Bloom's taxonomy is a powerful tool in the educational setting as it allows teachers to make connections between objectives, and student skill level (Forehand, 2010).

Behaviorism

Gagne was influential during the 1960's with his behavioral approach to instructional design. His emphasized skill hierarchy was based in behavioral psychology and focused on observable behavior.

Like Bloom, Gagné believed in domains of learning, which he agreed were hierarchal. Gagné described five skills: verbal information, intellectual skills, psychomotor skills, attitudes, and cognitive strategies (Reiser, 2001). Robert Gagne's theoretical work contributed to the field of education and design of instruction. Gagne was one of the early developers of the concept of instructional systems design. It suggests the components of a lesson can be analyzed and designed to operate as an integrated plan for instruction.



Graphic created by Joy Vigil (2013) based on Bloom's Taxonomy (1956) and revisions by Anderson and Krathwohl (2000)

Gagne's work provided a foundation for instructional design. Although much of his earlier work was premised on behaviorist notions, he later wrote many books incorporating the assumptions and scientific approaches used in both Behaviorist and Cognitive Information Processing Theories (Recker, 1996). Gagne's work has had a significant influence on education, military and industrial training.

Constructivism

In the 1990's educational reform was structured by the constructivism movement. Constructivism is the idea that education needs to focus on real-world tasks and "authentic" learning. Rote memorization and repetition of tasks is not true learning. Constructivists argued that it was necessary for students to become active participants in the learning experience rather than passively receiving information from their teacher (Reiser, 2001).

"Constructivism says that people learn by making sense of the world-they make meaning by what they encounter" (Wilson, 2010). Wilson argues that that you must engage learners through activity and student involvement. Rather than "giving students a fish" in the form of pre-packaged lessons or canned classes, many teachers are trying to think of ways to "teach students to fish" by helping them make and master the tools with which to make their own meaning.

Some meaning-making tools are individual, such as problem formation and resolution tools, research tools, or reasoning tools. Other meaning-making tools are social, such as communication tools, negotiation tools, conflict resolution tools, or collaboration tools. In general, as the name "constructivism" implies, the task of the teacher is to assist students in developing and using tools (including tools for finding information) rather than "giving them information."

Problem-Based learning (PBL)

Based in Constructivism, PBL has its roots in medical training but has since spread to all realms of education. In problem-based learning, students conduct research. Like constructivism, the goal is for students to solve complex real-world problems through a collaborative learning process. In PBL, the problems must be "ill-structured" meaning that there is no single correct answer. This requires students to draw on a wide-range of content knowledge. Each student

is responsible for completing their own research on a topic which they then provide to the group. The group uses each member's research to make an informed decision. Problem-based learning is not so much concerned with having students learn specific content, as with learning life skills such as problem solving and effective collaboration that will aid them in becoming life-long learners (Savery, 2006).

Connectivism

Learning does not occur in isolation. Davis (2008) argues that the previous models of learning such as behaviorism, cognitivism and constructivism do not adequately relate how advances in technology have changed the field of education. Connectivism is the theory that we as learners are shaped by our past experiences. The decisions that we make are dependent on our experiences, and as we encounter new material these decisions change. Because we are constantly exposed to new information through the internet and social media, information can spread to millions of people worldwide within seconds (Davis, 2008).

Conclusion

Instructional Design has evolved and helped shape the design of instructional materials. E-learning has unique challenges and will need to choose the best mixture of approaches to provide optimal learning experiences. New design models are necessary that address e-learning as a separate field of education. It will be necessary to integrate various theories to create a unique collection of best practices.

Distance Education

Distance education can be traced back many years. Initially it was considered radical and revolutionary. It encouraged the democratization of education making it accessible to the average citizen. The first correspondence courses delivered through the postal service is considered the origin of distance education. An initial shorthand distance course in 1840 offered by Isaac Pitman in Great Britain paved the way for the introduction of correspondence courses in US high schools in 1929, then college credit courses broadcast on television in 1951 to the current proliferation of online courses and virtual high schools in the 1990's and 2000's .

In 1969, one of the first major successes in distance education was launched as Britain's Open University. It was a leader in the large-scale application of technology to facilitate distance learning (Nasseh, 1997). Britain's Open University also played a major role in the development of important research in distance learning. The Open University brought respect and confidence to correspondence education. The success of Britain's Open University was the major reason for the development of open universities in other countries. New York State's Empire State College (NYSES), was the first Open University in the United States. It commenced operation in 1971 with the main purpose of making higher education degrees more accessible to learners unable to attend traditional campus-based courses.

Distance education has evolved from pen and paper lessons delivered via the postal service to incorporate the latest technological advancements. For example, educational radio in the 1940s and educational television in the 1950s created important new forms of communication for use in distance education (Saba, 2008). Telephone systems played a prominent role in education with the introduction of new teleconferencing technologies in the 1980s and 1990s. Teleconferencing systems made it possible for teachers to talk with, hear, and see their students in real time around the world. With the development of the Internet in the 1990s, Distance Learning has become synonymous with e-learning.

Through the World Wide Web, Teachers and students are able to present text, pictures, audio, and video, file sharing and communicate via tools like email, chats and audio. Students can learn in synchronous (real time learning where participants are online at the same time), asynchronous (learning materials can be accessed at the convenience of the learner) and blended environments (where a percentage of the material is available online, however, students interact with the instructor in person as well).

Conclusion

The roots of e-learning are based in instructional media, instructional design and distance education. All three have largely developed independently and often ignorant of each other's strengths and challenges. We have arrived at a point in time where the three fields have collided to create the new field of e-learning. The

time is upon educators and researchers to integrate the newest technology and incorporate enlightened educational models of learning within the infrastructure provided by the distance education.

Current State of E-learning K-12 Education

E-learning can be seen in many different forms in K-12 education. The first model of E-learning is in virtual classrooms. Here, students take all of their classes online, with no face-to-face interaction with their teacher or peers. In 1997, the first state funded virtual schools in Florida were opened (Saba, 2008). Since then, the number of online schools has grown dramatically. Presently, 31 states have full-time state-funded online schools. There were over 1.8 million enrollments in distance-education courses in K-12 in 2009-2010, most of which were online courses (iNACOL, 2012).

Blended learning provides a second method of how e-learning can be used in the classroom. This model involves traditional teacher-led classroom instruction with approximately 30-79% of the material available online (Allen, 2007). Usually, a corresponding website is built to run concurrently with enrollment in the class. This website acts as a type of electronic performance support system. Reiser (2001) describes electronic performance support systems as "computer-based systems designed to provide workers (students) with the help they need to perform certain tasks at the time they need the help, and in a form that will be most helpful."

Teachers can use online material to frontload their classes by introducing students to new material prior to seeing it in class. They may provide online tutorials or virtual labs which guide students through difficult material. E-learning also allows teachers to customize each student's education by allowing students to move through material at their own pace, and to at times even choose which assignments they want to complete. This shift to student-centered learning reflects the constructivist principles.

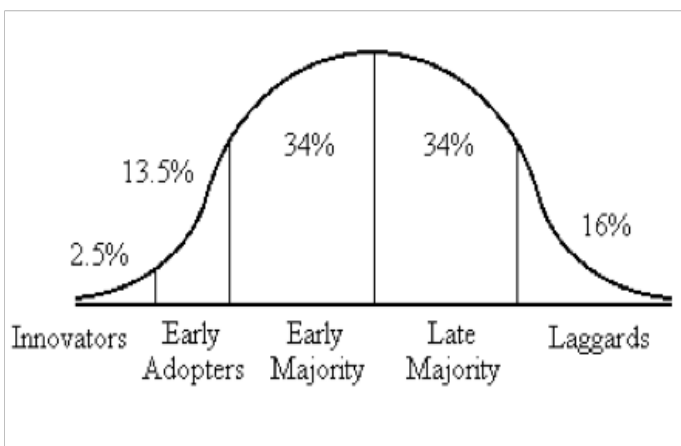
Higher Education

According to Walton Radford (2011), the number of undergraduate students enrolled in at least one distance learning (or e-learning) course increased from 8

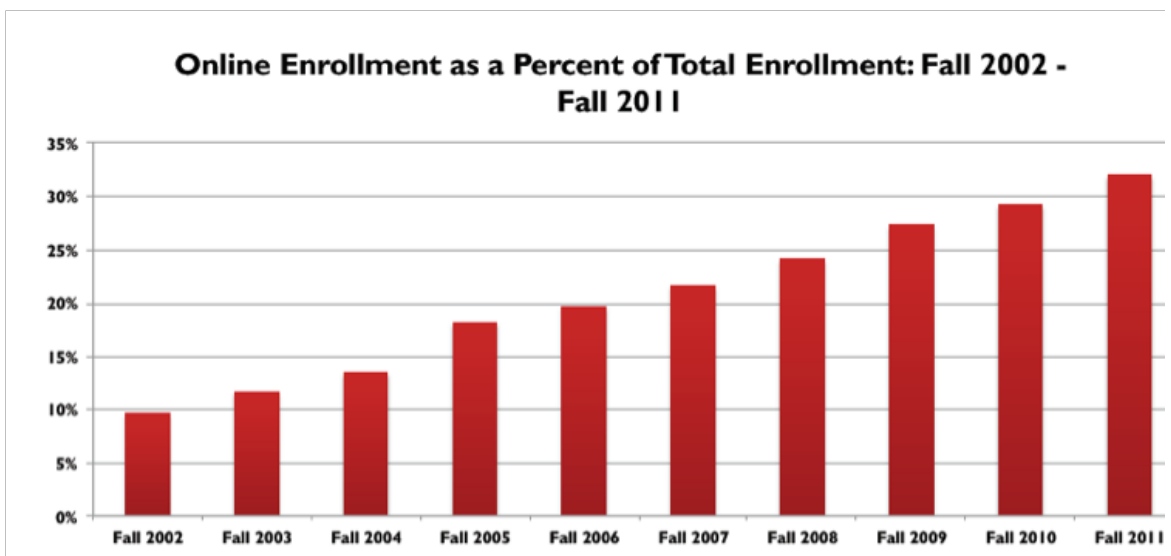
percent to 20 percent between 2000 and 2008. She also found that the number of students exclusively enrolled in a distance degree program varied with no substantial upward trend. In fact, the number of students who are enrolled in a degree program via e-learning is not as high as we would expect.

As the U.S Department of Education explains in *The Condition of Education* (2011), “Distance education courses and programs provide flexible learning opportunities to both undergraduate and post baccalaureate students.” Therefore, it is curious as to why more students are not taking advantage of the e-learning trends and availability in higher education.

This information suggests that currently the majority of learners prefer and/or have more access to face-to-face learning opportunities rather than fully embracing the flexible nature of e-learning. Surry and Ely further clarify that this current lack of emersion of e-learning may be due to the observed trends of Adoption, Diffusion, Implementation, and Institutionalization of Educational Technology. Rogers as cited by Surry and Ely (N.D.), explains that there are five stages of concept adopters: innovators, early adopters, early majority, late majority, and laggards.



Surry, D. W., & Ely, D. P. (n.d.). *Adoption, Diffusion, Implementation, and Institutionalization of Educational Technology*. Retrieved February 9, 2013, from <http://www.southalabama.edu/coe/bset/surry/papers/adoption/chap.htm>



Weissmann (2013, January 9). Colleges are warming up to online learning (teachers are not). *The Atlantic*. Retrieved from <http://www.theatlantic.com/business/archive/2013/01/colleges-are-warming-up-to-online-learning-teachers-are-not/266947/>

With only approximately 20 percent of U.S. undergraduate students enrolled in a distance learning course, it is possible that due to the newness of e-learning, users are primarily in the innovator/early adopter range. Over time, with further expansion of e-learning opportunities and resources, along with continued exposure to e-learning within K-12 environments the upward trend in e-learning may increase as these students pursue undergraduate studies.

Corporate

E-learning is not only commonly found in schools and universities, but also in the corporate world. It is used for training employees on new products and systems, upgrading employee skills and general communication. E-learning offers training without the expense of traveling to seminars and conferences which means less productivity time lost. With readily available technology such as laptops and mobile devices, training and development is accessible when and where it is most needed. This allows businesses to be more efficient and address precise requirements. In the increasingly global world, e-learning allows corporations to keep all employees worldwide abreast of current trends, new products and training.

E-learning also facilitates employee growth, motivation, job satisfaction and ultimately affects work performance. Affording employees the opportunity to learn at their own pace from home, the office or while traveling encourages career growth. Well-designed e-learning can increase profitability which is critical in

the competitive world of business (Shankar, 2007).

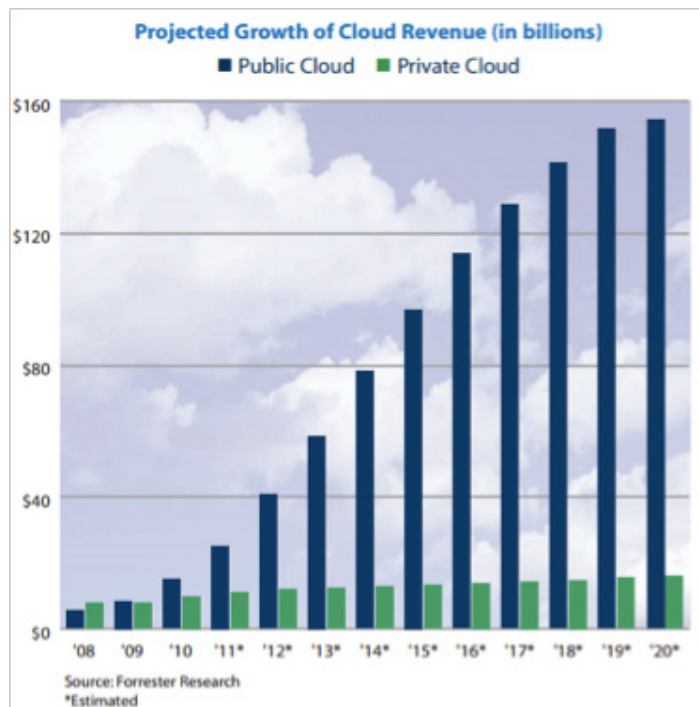
Future Trends

As more and more students, educators, and educational institutions become familiarized with the e-learning field, we will move through Roger's predictions of innovation adopters showing a majority of users embracing and flourishing within an e-learning environment. Some of the future trends predicted to impact e-learning include: cloud computing, social media, mobile devices, massive online open courses (MOOCs), and the concept of Open Learning.

Cloud Computing

Cloud computing is defined as a, "new industry where services are offered and delivered via a network, primarily the internet" (Marasco, 2013). Marasco goes on to explain that cloud computing has three main benefits:

- Software (like accounting, information systems, or HR)
- Storage (benefits of data storehouses without owning the necessary tools)
- Infrastructure (benefits of hardware and struc-



Marasco, B. (2013, February 8). Cloud Computing, The Future, and Your Money. In *The Motley Fool*. Retrieved February 9, 2013, from <http://beta.fool.com/marascobn1/2013/02/08/cloud-computing-future-and-your-money/23615/>

ture without owning the assets)"

Although private cloud computing (private network on-site) is not nearly as lucrative as public (infrastructure offered off-site), they are both growth areas

allowing for tremendous collaboration of vital information between learners and educators. It also gives greater access to information which in the past has required software-specific tools. Cloud computing has the potential to boost opportunities for connectivism and collaboration and will likely play a significant role in the advancement of e-learning.

Social Media and Informal Learning

As social beings, social learning is a natural way of learning. The appeal of social media and informal learning stems from the simple notion that people can connect with one another virtually while, "allowing people to interact in ways that are 'more like [how] human beings interact'" (Plummer as cited by Schaffhauser, 2013, January 10). Social media is a major piece of connectivism and collaboration of peers, classmates, co-workers, and families. When organizations try to block sites such as Facebook or Twitter from their networks, it only gives bad credibility to the organization. Moreover, most individuals have access to both arenas with a mobile device. Social media is here to stay and will only continue to flourish. Rather than fighting this trend, the field of e-learning must search for meaningful ways of integrating it into its framework. Allowing for an open stream of communication and networking can significantly boost informal learning opportunities and collaboration (Schaffhauser, 2013, January 10).

Mobile

With mobile devices, learning opportunities are no longer bound to the classroom or even a Wi-Fi hotspot--one can be receiving information with, "whomever, wherever, and whenever" they want (Plummer as cited by Schaffhauser, 2013, January 10). Because mobile technology connects us to social media easily and quickly, Plummer also concluded that networked information (whether private or public) will be shared on Facebook or Twitter (Schaffhauser, 2013, January 10).

Podcasting is a mobile technology that creates audio files in MP3 format and makes them available online or to download to your computer or handheld device. Podcasting is one of the instructional tools that can revolutionize online learning and is particularly useful to students with learning difficulties. Students can listen to and pause content as they see fit. Then there is Vodcasting (video-on-demand casting). It is

the same principle as podcasting with the addition of Video. Both Podcasting and Vodcasting can be a great facilitator to increase student engagement. It is also an inexpensive way to create digital content for the classroom and can be readily shared. It can also help foster student creativity by encouraging them to create and share video/audio content within their learning environment.

Massive Online Open Courses (MOOCs)

Arguably one of the most innovative advances in e-learning is Massive Online Open Courses (MOOCs). Here, literally thousands of students can enroll in a course which is offered free of charge. As Christensen explains, as cited in Regalado (2012, November 2), online learning, “will continue to spread and get better, and eventually it will topple many ideas about how we teach—and possibly some institutions as well.” Perhaps with these shifts, the field of higher education will no longer only be accessible to those who have money, but rather to those who have a desire to learn. Nagel (2013) further explains, “Designed to provide high quality, online learning at scale to people regardless of their location or educational background, MOOCs have been met with enthusiasm because of their potential to reach a previously unimaginable number of learners.”

Open Learning

Open learning is based on the idea that education must be open, because its purpose is to share expertise, knowledge and skills. David Wiley challenges educators to redefine education as a relationship of sharing. With digital expressions of expertise we have the potential to share on an enormous scope. The philosophy of Open Learning goes hand in hand with Open educational resources (OERs). These are freely accessible and openly licensed documents and media used for educational purposes. OERs have gained increased attention for their promise to cross demographic, economic, and geographic boundaries and to promote life-long personalized learning (Wiley and Hilton, 2009). The rapid growth of OERs provides new opportunities for teaching and learning. At the same time, they challenge established views about education.

Intellectual property, copyright and licensing issues have to be resolved since it is a potential impediment to creativity and education. Wiley encourages educators and researchers to question the notion of exper-

tise, as a possession and a commodity. He notes that if we want to share materials we must give permission though avenues provided by Creative Commons which offers open licensing of materials that would not be easily permitted under traditional copyright.

Challenges for the Future

The advancement of the e-learning field as a legitimate, credible field does not come without major challenges that can potentially slow down the proliferation of this great educational shift. Issues regarding limitations in bandwidth speeds, limitations in the classrooms, appropriate use of tablets and mobile devices, recognition of e-learning, copyright and OERs and the need to redefine the role of teachers in e-learning are some of the challenges.

Bandwidth and Internet Access

During the 2013 International Consumer Electronics Show, it was observed by the former president, Bill Clinton that the United States has not kept up with the advancements in bandwidth capabilities, thereby keeping the U.S. computer downloading speeds slower than our competing countries. He observed that South Korea is now number one in bandwidth capabilities internationally while the U.S. has dropped to number fifteen. “Our speeds are one-fourth of theirs, and we have fallen off the map,” Clinton said (Levin, B., & Satterwhite, E., 2013, January 9). Unfortunately, many rural areas are not connected with high-speed internet and organizations such as Colorado EAGLE-Net are operating, “a cost-sharing cooperative that delivers a carrier quality broadband network to more than 170 communities across the state. EAGLE-Net is building a sustainable network to better connect education, libraries, government and healthcare facilities statewide.” (Colorado EAGLE-Net, 2013). Such initiatives, however, require political support and can be difficult and costly to implement.

Limitations in the Classroom

Schools often have very strict firewalls that inhibit connections to resources that are appropriate and engaging. Earlier in the 2012-2013 school year, a teacher at a local charter school north of Denver assigned her fourth grade students a math assignment using the website for Discovery Education. When the students attempted to complete the assignment, none of the computers at school were capable of reaching the site due to firewall restrictions. Instead, one of the fourth

graders used a mobile device to access the site and complete the assignment. This digital native was able to circumvent the problem, because he had access to a mobile device (J. Deaser, personal communication, February 10, 2013).

Attitudes towards allowing the use of mobile devices in classrooms will have to be reexamined or access to valuable learning opportunities will be missed. If a teacher or facilitator can use apps as supplemental tools to instruction, students are given yet another opportunity to develop understanding and comprehension of ideas. So whether the student is in the classroom, sitting in a waiting room at the doctor's office, or traveling outside of the state or country, having access to mobile technology keeps the learner connected and engaged with the content of the course.

Tablets

Tablets are an exciting e-learning tool that has the potential to provide rich multimedia content that is portable, versatile and accessible to all ages. As yet, the cost of tablets is still too expensive; however, just as we saw the cost of microprocessors decrease with time, the cost of tablets will also decrease. Already schools are purchasing them en masse for use in the classroom. They have the potential to reach more students through various multimedia channels and be highly motivating. Pilot programs reveal students who accessed material via an iPad scored higher on tests than those using traditional textbooks (Rock, 2012). One challenge will be to develop applications that are able to operate on various tablets (iPad, Playbook, Android). Furthermore, adequate infrastructure must be built so that networks are not maxed out.

Recognition of E-learning

There was a time when distance learning degree programs were not widely accepted as accredited accomplishments. However, as Lemaire (2011) explains, many political leaders have begun making e-learning an integral piece of the state-mandated educational standards. Often this is due to the need of broader opportunities for students living in rural areas where educational options are limited. With more reputable institutions such as MIT, UCLA and Stanford offering e-learning programs, the profile of e-learning will increase.

OERs/Copyright

Intellectual property issues are at the heart of OERs. It was suggested that the issue of copyright and ownership of material is “the root cause of slow development in this field,” inhibiting some faculty members and institutions from making more educational content available to the online community (OECD, 2007). Before publishing educational resources that make use of third-party materials on the Internet, the author, or the publisher, must ensure they have the right to use these materials. To help address issues such as this and many more, Creative Commons has launched a new division - Learning Commons, which focuses specifically on education. The mission of Learning Commons is to break down the legal, technical, and cultural barriers to a global educational commons. Learning Commons will provide advice and expertise to the OER community to assist in overcoming these obstacles.

The Changing Roles of Teachers

The Educational Testing Service (ETS) concluded that, “Today’s students are part of a technology-savvy generation, but they are often still at loss when it comes to using their critical thinking and problem solving skills in a digital environment” (cited in Guri-Rosenblit and Gros, 2011). Simply put, studying effectively and efficiently through electronic technologies is not a natural attribute of the young generation. This highlights the crucial role of teachers and experts in designing meaningful study experiences.

The traditional role of education at all levels is not to simply impart information, but to assist students in constructing knowledge. Accessible information does not automatically turn into meaningful learning experiences without the assistance of a teacher or an expert. Furthermore, developing online coursework and maintaining appropriate technological infrastructures far exceed what was once expected (Guri-Rosenblit and Gros, 2011). It is no longer acceptable to continue with practices that yield no significant differences than traditional classrooms settings. Research must pursue the answers to most cost effective and most effective pedagogical practices that will help policy makers, administration and teachers make the most of e-learning.

Teachers will be challenged to adopt new roles in order to manage effective e-learning practices. Although they have moved beyond, “Sage on the Stage” neither

References

- Allen, E., Seaman, J., and Garrett, R. (2007) Blending In: The Extent and Promise of Blended Learning in the United States. Retrieved from the Sloan Consortium Website: <http://sloanconsortium.org/publications/survey/blended06>
- “E” in e-learning vanishing? (2012, August 15). Retrieved from <http://www.learning2012.com/item/e-in-e-learning-vanishing.html>
- Chadwick, K. (2013, January 11). E-learning trends: what to expect in 2013. Retrieved from <http://www.bizcommunity.com/Article/196/98/87668.html>
- Cross, J. (2004) An informal history of elearning. *On the Horizon*, 12(3), 103-110. doi: 10.1108/10748120410555340
- Davis, C, Edmunds, E, & Kelly-Bateman, V. (2008). Connectivism. In M. Orey (Ed.), *Emerging perspectives on learning, teaching, and technology*. Retrieved from <http://projects.coe.uga.edu/epltt/>
- Downes, S. (2005, October). E-learning 2.0. Retrieved from <http://elearnmag.acm.org/featured.cfm?aid=1104968>
- Forehand, Mary. (2010, July). Bloom’s Taxonomy: From emerging perspectives on learning, teaching and technology. Retrieved from <http://www.roe11.k12.il.us/GES%20Stuff/Day%204/Process/Blooms/Mary%20Forehand%20discussion-Bloom’s%20Taxonomy.pdf>
- Guri-Rosenblit, S & Gros, B. (2011). E-Learning: Confusing terminology, research gaps and inherent challenges. *The Journal of Distance Education*, 25(1). Retrieved from <http://www.jofde.ca/index.php/jde/article/view/729/1206>, 467-493.
- Horton, W. (2012). *E-learning by Design*. San Fransisco: CA:Pfeiffer.
- iNACOL (October, 2012). Fast facts about online learning. Retrieved from (http://www.inacol.org/press/docs/nacol_fast_facts.pdf).
- Jolly, J. L. (2009). The National defense education act, current STEM initiative, and the gifted. *Gifted Child Today*, 32(2), 50-53. Retrieved from http://www.nagc.org/uploadedFiles/Information_and_Resources/Hot_Topics/The%20National%20Defense%20Act.pdf
- Lemaire, M. (2011, August 17). Why online education doesn’t suck. In *OnlineSchools.com*. Retrieved February 9, 2013, from <http://www.onlineschools.com/blog/why-online-education-doesnt-suck>
- Lenhart, A. (2012, March 19). Cell phone ownership. Retrieved from <http://pewinternet.org/Reports/2012/Teens-and-smartphones/Cell-phone-ownership/Overall-cell-ownership-steady-since-2009.aspx>
- Levin, B., & Satterwhite, E. (2013, January 9). Gangnam bandwidth, American style. In *Gig.U*. Retrieved February 10, 2013, from <http://www.gig-u.org/news/gangnam-bandwidth-american-style-blair-levin-and-ellen-satterwhite-gig-u>
- Marasco, B. (2013, February 8). Cloud computing, the future, and your money. *The Motley Fool*. Retrieved February 9, 2013, from <http://beta.fool.com/marascobn1/2013/02/08/cloud-computing-future-and-your-money/23615/>

- Merrill, M. D., Drake, L., Lacy, M. J., Pratt, J., & ID2_Research_Group. (1996). Reclaiming instructional design. *Educational Technology*, 36(5), 5-7. Retrieved from <http://mdavidmerrill.com/Papers/Reclaiming.PDF>
- Nagel, D. (2013, February 4). 6 Technologies That Will Impact Higher Ed. In *Campus Technology*. Retrieved February 10, 2013, from <http://campustechnology.com/Articles/2013/02/04/6-Technologies-That-Will-Impact-Higher-Ed.aspx?Page=1>
- Nasseh, B. (1997). A Brief History of Distance Education. Retrieved from <http://www.seniornet.org/edu/art/history.html>
- OECD (2007). Giving Knowledge for Free: the Emergence of Open Educational Resources, <http://tinyurl.com/62hjsx6>
- Recker, M. (1996). Gagne's theories of instruction. Utah State University. Retrieved from <http://itls.usu.edu/~mimi/courses/6260/theorists/gagne/overview.htm>
- Reiser, R.A. (2001). A history of instructional design and technology - Part I: A history of instructional media. *Educational Technology Research & Design*, 49(1), 53-63.
- Reiser, R.A. (2001). A history of instructional design and technology - Part II: A history of instructional design. *Educational Technology Research & Design*, 49(2), 57-67.
- Regalado, A. (2012, November 2). The Most Important Education Technology in 200 Years. In *MIT Technology Review*. Retrieved February 9, 2013, from <http://www.technologyreview.com/news/506351/the-most-important-education-technology-in-200-years/>
- Rock, Margaret (2012, April 4). The future of education: Tablets vs textbooks. *Mobiledia*. Retrieved from <http://www.mobiledia.com/news/136174.html>
- Saba, F. (2008). An Introduction to Distance ed and e-learning. *Distance-Educator.com*
- Savery, John. (2006). Overview of Problem-based Learning: Definitions and Distinctions. *Interdisciplinary Journal of Problem-based Learning*, 1 (1). Available at <http://dx.doi.org/10.7771/1541-5015.1002>
- Schaffhauser, D. (2013, January 10). Gartner Predicts Cloud, Social, Mobile, and Information Forces Will Shape 2013. In *Campus Technology*. Retrieved February 10, 2013, from <http://campustechnology.com/articles/2013/01/10/gartner-predicts-cloud-social-mobile-and-information-forces-will-shape-2013.aspx?admgarea=topic.mobilecomputing>
- Shankar, V. (2007, April 19). E-learning in the Corporate World. *Articlesbase*. Retrieved from <http://www.articlesbase.com/online-business-articles/elearning-in-the-corporate-world-133828.html>
- Surry, D. W., & Ely, D. P. (n.d.). Adoption, Diffusion, Implementation, and Institutionalization of Educational Technology. Retrieved February 9, 2013, from <http://www.southalabama.edu/coe/bset/surry/papers/adoption/chap.htm>
- Walton Radford, A. (2011, October 5). Learning at a Distance: Undergraduate Enrollment in Distance Education Courses and Degree Programs. In *National Center for Education Statistics*. Retrieved February 9, 2013, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>

- Wiley, D. & Hilton, John 111 (2009). Openness, dynamic specialization, and the disaggregated future of higher education. *International Review of Research in Open and Distance Learning*. 10(5), 1-16. Retrieved from <http://contentdm.lib.byu.edu/cdm/ref/collection/IR/id/160/rec/13>
- Wilson, Brent. (2010). *Constructivism in Practical and Historical Context*. Draft Chapter for inclusion in Bob Reiser & Jack Dempsey (Editors), *Current Trends in Instructional Design and Technology* (Third edition). Upper Saddle River NJ: Pearson Prentice Hall, 2011.
- U.S. Department of Education. (2011). *The condition of education* (NCES 2011-033). Alexandria, VA: ED Pubs, U.S. Department of Education. Retrieved from <http://nces.ed.gov/pubs2011/2011033.pdf>