

# **E-Learning and Its Effects on Teaching and Learning in a Global Age**

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## **Abstract**

E-learning presents an entirely new learning environment for students, thus requiring a different skill set to be successful (Romiszowski, 2004). Critical thinking, research, and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through (New Media Consortium, 2007). Also, particularly in courses that are entirely electronic, students are much more independent than in the traditional setting. This requires that they be highly motivated and committed to learning (Huynh et al., 2003), with less social interaction with peers or an instructor. Students in online courses tend to do as well as those in classrooms, but there is higher incidence of withdrawal or incomplete grades (Zhang, Zhou and Briggs, 2006).

E-learning can be viewed as computer assisted learning, and as pedagogy for student-centered and collaborative learning. Early developments in e-learning focused on computer assisted learning, where part or all of the learning content is delivered digitally. More recently the pedagogical dimension of e-learning has become prominent. E-learning comprises all forms of electronically supported learning and teaching. The information and communication systems, whether networked learning or not, serve as specific media to implement the learning process.

**Keywords:** E-learning, efficient, computer-based.

## **Introduction**

E-learning according to Markus(2008) can be defined as a learning process created by interaction with digitally delivered content, network-based services and tutoring support E-learning is any technologically mediated learning using computers whether from a distance or in face to face classroom setting (computer assisted learning), it is a shift from traditional

education or training to ICT-based personalized, flexible, individual, self-organized, collaborative learning based on a community of learners, teachers, facilitators, experts.

E-learning is the use of Internet technologies to enhance knowledge and performance. E-learning technologies offer learners control over content, learning sequence, pace of learning, time, and often media, allowing them to tailor their experiences to meet their personal learning objectives. to manage access to e-learning materials, consensus on technical standardization, and methods for peer review of these resources. E-learning presents numerous research opportunities for faculty, along with continuing challenges for documenting scholarship. Innovations in e-learning technologies point toward a revolution in education, allowing learning to be individualized (adaptive learning), enhancing learners' interactions with others (collaborative learning), and transforming the role of the teacher. The integration of e-learning into education can catalyze the shift toward applying adult learning theory, where educators will no longer serve mainly as the distributors of content, but will become more involved as facilitators of learning and assessors of competency.

E-learning refers to the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance. E-learning can be used by medical educators to improve the efficiency and effectiveness of educational interventions in the face of the social, scientific, and pedagogical challenges noted above. It has gained popularity in the past decade; however, its use is highly variable among medical schools and appears to be more common in basic science courses than in clinical clerkships.

E-learning is also called Web-based learning, online learning, distributed learning, computer-assisted instruction, or Internet-based learning. Historically, there have been two common e-learning modes: distance learning and computer assisted instruction. Distance learning uses information technologies to deliver instruction to learners who are at remote locations from a central site. Computer assisted instruction (also called computer-based learning and computer based training) uses computers to aid in the delivery of stand-alone multimedia packages for learning and teaching. Multimedia learning. Multimedia uses two or more media, such as text, graphics, animation, audio, or video, to produce engaging content that learners access via computer. Blended learning, a fairly new term in education but a concept familiar to most educators, is an approach that combines e-learning technology with traditional instructor-led training, where, for example, a lecture or demonstration is supplemented by an online tutorial. Faculty, administrators, and learners find that multimedia e-learning enhances both teaching and learning. These advantages can be categorized as targeting either learning delivery or learning enhancement. Learning delivery is the most often cited advantage of e-learning and includes increased accessibility to information, ease in updating content, personalized instruction, ease of distribution, standardization of content, and accountability. Accessibility refers to the user's ability to find what is needed, when it is needed. Improved access to educational materials is crucial, as learning is often an unplanned experience. Updating electronic content is easier than updating printed material: e-learning technologies allow educators to revise their content simply and quickly. Learners have control over the content, learning sequence, pace of learning, time, and, often, media, which allows them to tailor their experience to meet personal learning objectives.

Internet technologies permit the widespread distribution of digital content to many users simultaneously anytime and anywhere. An additional strength of e-learning is that it

standardizes course content and delivery; unlike, for instance, a lecture given to separate sections of the same course. Automated tracking and reporting of learners' activities lessen faculty administrative burden. Moreover, e-learning can be designed to include outcomes assessment to determine whether learning has occurred. Advantages in learning enhancement are a less well recognized but potentially more revolutionary aspect of e-learning than are those related to learning delivery. E-learning technologies offer educators a new paradigm based on adult learning theory, which states that adults learn by relating new learning to past experiences, by linking learning to specific needs, and by practically applying learning, resulting in more effective and efficient learning experiences.

Learning enhancement permits greater learner interactivity and promotes learners' efficiency, motivation, cognitive effectiveness, and flexibility of learning style. Learning is a deeply personal experience: we learn because we want to learn. By enabling learners to be more active participants, a well-designed e-learning experience can motivate them to become more engaged with the content. Interactive learning shifts the focus from a passive, teacher-centered model to one that is active and learner centered, offering a stronger learning stimulus. Interactivity helps to maintain the learner's interest and provides a means for individual practice and reinforcement. Evidence suggests that e-learning is more efficient because learners gain knowledge, skills, and attitudes faster than through traditional instructor-led methods. This efficiency is likely to translate into improved motivation and performance.

E-learners have demonstrated increased retention rates and better utilization of content, resulting in better achievement of knowledge, skills, and attitudes. Multimedia e-learning offers learners the flexibility to select from a large menu of media options to accommodate their diverse learning styles.

### **Policy Considerations**

E-learning has become popular because of its potential for providing more flexible access to content and instruction at any time, from any place (Means et al, 2009).

Focus for policy consideration entails the following:

- a) Increasing the availability of learning experiences for learners who cannot or choose not to attend traditional face-to-face offerings,
- b) Assembling and disseminating instructional content more cost-efficiently,
- c) Enabling instructors to handle more students while maintaining learning outcome quality that is equivalent to that of comparable face-to-face instruction.

If student outcomes are the same whether a course is taken online or face-to-face, then online instruction can be used cost-effectively in settings where too few students are situated in a particular geographic location to warrant an on-site instructor (e.g., rural students, students in specialized courses).

### **Components of E-Learning**

Creating e-learning material involves several components: once content is developed, it must be managed, delivered, and standardized. Content comprises all instructional material, which can range in complexity from discrete items to larger instructional modules. A digital learning object is defined as any grouping of digital materials structured in a meaningful way and tied to an educational objective.

Learning objects represent discrete, self contained units of instructional material assembled and reassembled around specific learning objectives, which are used to build larger educational materials such as lessons, modules, or complete courses to meet the requirements of a specified curriculum.

Examples include: tutorials, case-based learning, hypermedia, simulations, and game based learning modules. Content creators use instructional design and pedagogical principles to produce learning objects and instructional materials. Content management includes all the administrative functions (e.g., storing, indexing, cataloging) needed to make e-learning content available to learners.

Examples include portals, repositories, digital libraries, learning-management systems, search engines, and e-Portfolios.

### **Synchronous or asynchronous delivery of content**

Synchronous delivery refers to real-time, instructor-led e-learning, where all learners receive information simultaneously and communicate directly with other learners. Examples include teleconferencing (audio, video, or both), Internet chat forums, and instant messaging. While in asynchronous delivery, the transmission and receipt of information do not occur simultaneously. The learners are responsible for facing their own self instruction and learning. The instructor and learners communicate using e-mail or feedback technologies, but not in real time. A variety of methods can be used for asynchronous delivery, including email, online bulletin boards, newsgroups, and Weblogs. In addition to establishing, managing, and delivering content, a fourth component is part of the e-learning equation. It is becoming increasingly clear that standards are needed for the creation of new e-learning material. Such standards promote compatibility and usability of products across many computer systems, facilitating the widespread use of e-learning materials.

### **The Evidence for Effective and Efficient E-Learning**

The effectiveness of e-learning has been demonstrated primarily by studies of higher education, government, corporate, and military environments. However, these studies have limitations, especially because of the variability in their scientific design. Often they have failed to define the content quality, technological characteristics, and type of specific e-learning intervention being analyzed. In addition, most have included several different instructional and delivery methodologies, which complicates the analysis. Most of these studies compared e-learning with traditional instructor-led approaches. Yet three aspects of e-learning have been consistently explored: product utility, cost-effectiveness, and learner satisfaction. Utility refers to the usefulness of the method of e-learning. Several studies outside of health care have revealed that most often e-learning is at least as good as, if not better than, traditional instructor-led methods such as lectures in contributing to demonstrated learning. Gibbons and Fair weather cite several studies from the pre-Internet era, including two meta analyses that compared the utility of computer-based instruction to traditional teaching methods. The studies used a variety of designs in both training and academic environments, with inconsistent results for many outcomes. Yet learners' knowledge, measured by pre-post test scores, was

shown to improve. Moreover, learners using computer-based instruction learned more efficiently and demonstrated better retention.

### **Evaluating E-Learning Processes and Outcomes**

Adopting e-learning and its technology requires large investments in faculty, time, money, and space that need to be justified to administrators and leadership. As with other educational materials, there are two major approaches to the evaluation of e-learning: process and outcomes. Process evaluation examines an e-learning program's strengths and weaknesses and how its results are produced, often providing information that will allow others to replicate it. Peer review is one type of process evaluation. Traditional peer review for journal articles verifies the quality of content.

E-learning requires the consideration of additional dimensions. For example, is it easy to "navigate" through the online material? Is the appearance conducive to education? Are multimedia elements used effectively? Is the interactivity appropriate for the level of the learner? Are special computer skills, hardware, or software required? These and other questions place new demands on peer reviewers engaged in process evaluation of e-learning. In fact, the AAMC, at the request of the Council of Deans, has begun a peer-review process of e-learning that recognizes these materials as evidence of scholarly activity for faculty promotion and recognition. Outcome evaluation of changes in learners' knowledge, skills, or attitudes allows e-learning developers to gauge program effectiveness. The evaluation framework outlined by Kirkpatrick in the 1950s and later adapted to health care education can be used to evaluate e-learning interventions. The Kirkpatrick model defines four levels of evaluation based on outcome: satisfaction, learning, change in learner behavior, and organizational change patient outcome. Satisfaction measures learners' reactions to the material: Was it easy to use, hard to use, fun, boring, and so forth. But satisfaction measures alone do not measure learning. For example, excellent content that learners find difficult to use may be rated as poor. Likewise, a module that is highly entertaining in its use of multimedia but superficial in its content may be rated as excellent.

### **Family and Home Effects of E-learning**

Parental involvement and other home effects are often secondary, if not peripheral, to the goals of e-Learning deployment. Nevertheless, e-Learning does seem to produce some positive effects in the home.

Evidence suggests a relationship between frequency of home PC use and academic achievement. Reviewing data from the 1996 National Assessment of Educational Progress in mathematics, one study reported that students using home computers more often had higher levels of achievement in mathematics. (Wenglinsky, USA) This seems to echo findings from previous studies, describing incremental impacts when technology is more mobile, personalized, and integrated throughout the day and across the curriculum. Another impact noted by researchers is increased family interaction. Many school systems establish an e-

Learning portal that parents can access to track homework assignments and communicate with teachers and staff, providing

Opportunities for increased awareness and discussion of homework assignments, student progress, and so forth. In addition, when students bring their laptops home, they are free to study in the sitting room with family rather than in a more isolated room. This gives parents greater visibility of school work and opens new avenues for discussion. (Mitchell Institute, USA).

### **Social and Community Effects**

By issuing a laptop to each student, schools aim to meet the educational needs of students who ordinarily could not afford a PC and thereby improve the performance of all students. Research shows that this strategy is working.

- In studies of students with disabilities, researchers have observed improved student self-esteem, increased motivation and ability to work independently, and other academic achievements such as improved quality and quantity of student writing. (Harris, USA).

### **How to make e-learning more effective:**

Provision of the listed points will improve E-learning effectively.

- Availability of hardware (particularly computers)
- Faster Internet connectivity/improved bandwidth
- Improved software
- Appropriate policies favouring e-learning
- Provision of technical support for e-learning at a range of scales
- Lower prices for connectivity
- Availability of reliable electricity
- Appropriate content in appropriate languages
- Awareness raising about the value of e-learning
- Improved training for teachers in e-learning at all levels.

### **Benefits of e-learning**

- E-learning is important for education because it can improve the quality of the learning experience, and extend the reach of every lecturer and tutor.
- E-learning can help remove barriers to achievement, by providing new and creative ways of motivating and engaging pupils and learners of all abilities, enabling and inspiring every one to attain their educational potential.
- E-learning can support learning by offering differentiated learning, Particularly for those who need support in literacy, numeracy and ICT.
- E-learning offers a wide range of tools to enable teachers and learners to be innovative, creative and resourceful in all learning activities. Teachers and learners can easily

customize digital learning resources to suit pace and level, appropriate to any learning style and ability.

- E-learning creates on-line communities of practice. The Internet can bring learners, teachers, specialist communities, experts, practitioners and interest groups together to share ideas and good practice.
- E-learning can provide an individualized learning experience for all learners, including those who are disadvantaged, disabled, exceptionally gifted, have special curriculum or learning needs or who are remote or away from their usual place of learning.
- E-learning can facilitate wider participation and fairer access to further and higher education by creating the opportunity to start learning and to choose courses and support according to the learners' needs.
- E-learning provides personalized learning support through information, advice, and guidance services. It can help learners find the course they need, with a seamless transition to the next stage of their learning, including online application or enrolment and an electronic portfolio of their learning to take with them.
- E-learning provides virtual learning worlds where learners can take part in active and creative learning with others through simulations, role-play, remote control of real-world tools and devices, online master classes, or collaboration with other education providers.

## **Conclusion**

E-learning is a large and growing market with great potential in higher education. (Means et al, 2009). In his empirical study from 1996 and 2008 concluded that students using e-learning performed better than students who did not use e-learning. The students who performed best were those who received blended learning.

In order to maximize this potential, e-learning implementations should endeavor to satisfy the needs and concerns of all stakeholder groups as much as possible.



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