The Effect of Using E-Learning Curriculum And Traditional Classroom Curriculum :Comparison &Merits

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Abstract

With the popularity of e-learning and computer-aided training, the need for curriculum designed specifically for the electronic environment needs to be evaluated. Many curriculum models developed over the past 30 years are proven and have stood the test of time, but their design is aimed toward the purpose of designing traditional classroom training. This article looks at some of the differences between the traditional student and the e-learning student and compares their needs to some of the traditional models of designing curriculum. The author then combines the needs of an average e-learner with a curriculum model to form a model for designing an electronic environment curriculum.

Keywords - E-learning ,curriculum, traditional, blended learning

1   Introduction

One of the major teaching challenges of higher education is helping students to bridge knowledge with real life practice. The need for additional training to compete in the job market coupled with the already overloaded schedules of most young people make the idea of accessing training on their own time frame an attractive way to enhance their careers (Magoulas, Papanikalaou, & Grigoriadou, 2003: 511-527). The idea of regularly scheduled classes attended at the community college or local university is not a feasible or desirable alternative for the non-traditional student's academic or technological advancement Web-based learning with its "anywhere, anytime, anyplace" (Honey, 2001:200-202:)

Technology is changing on a daily basis and the use of technology for educational purposes is quickly becoming a necessity for proper instruction. "It is estimated that workers would have to prepare for two to three career changes in their lifetime" (Molnar, 1997, : 12). E-learning or Internet based instruction is gaining popularity because of the need for additional training to compete in the job market (Judy & D'Amico, 1997). Many young people who work, go to school, and try to maintain a personal or family life are looking for training they can complete in their own time frame (Magoulas, Papanikalaou, & Grigoriadou, 2003).

Although the popularity of e-learning is increasing, many curriculum developers are using the same models to create e-learning instruction as they use to design and develop face-to-face teacher/learner instruction. "Too often e-learning simply regurgitates pages of text pulled from books and classroom courses. E-learning more often than not amounts to e-reading" (Honey, 2001, p. 201).

The final product is classroom instruction on the Internet without the instructor (Munro & Rice-Munro, 2004). Most educators agree that there is a significant difference between on-line learning and traditional classroom learning. The first question arises, should there be a separate curriculum model for e-learning than for traditional classroom learning? If so, what differences need to be incorporated in an e-learning curriculum model to ensure proper education of its students?

1.1   A Review of Curriculum Models

Models used for curriculum design are developed to give educators a map orguideline from which to develop curriculum or instruction for use in their field. The models are designed so that by following a process the educator can produce complete and instruction-ready material for their students on a consistent basis. There are numerous curriculum models available that are specialized to fit any given situation but Gustafson and Branch (1997) divides them into three categories: Classroom Orientation, Product Orientation, and System Orientation.

Classroom Orientation models are designed for teachers in the classroom to develop their instruction for their own students and can be used by teachers at every level as : vocational school, college, and university level. These models are also used in some business and industrial applications (Gustafson & Branch, 1997). Some examples of these models include:

- The Gerlach and Ely Model

- The Kemp, Morrison, and Ross Model

- The Heinich, Molenda, Russell, and Smaldino Model

- The Reiser and Dick Model (Brinkerhoff, 2001)

Product Orientation models assume that the product being developed will consist of several hours or days worth of instruction and would normally be used in producing a new instructional product that involves extensive testing. A teacher could use this model for larger amounts of instructional material or at the administrative level in developing curriculum for a class or department (Gustafson & Branch, 1997). Some examples of these models are:

- The Van Patten Model

- The Leshin, Pollock, and Reigeluth Model

- The Bergman and Moore Model (Brinkerhoff, 2001)

System Orientation models assume that an entire course or large amounts of instruction are being developed. This model could be used at the administrative level during planning and implementation stages of a new program or the retooling of existing programs (Gustafson & Branch, 1997). Some examples of this model include:

• The IDI (Instructional Development Institute) Model

• The IPISD (Interservices Procedures of Instructional Systems

Development) Model

• The Diamond Model

• The Smith and Ragan Model

• The Gentry IPDM (Instructional Project Development and

Management) Model

• The Dick and Carey Model (Brinkerhoff, 2001)

"An instructional development model should contain enough detail to establish

guidelines for managing people, places, and things that will interact together, and to estimate the resources required to complete a project" (Gustafson & Branch, 1997, p. 23*).*

The Dick and Carey model (see Figure 1 below), is one of the more versatile models and requires a ten-step process that incorporates all aspects of design and implementation of a curriculum program**.** Although this paper describes classroom and product orientation models**,** this author believes that the ideal starting point to develop a continued change in the process of developing e-learning curriculum would begin with a system orientation model similar to the Dick and Carey model.

For more details about these Models see (Survey of instructional development models)

(Brinkerhoff, 2001)
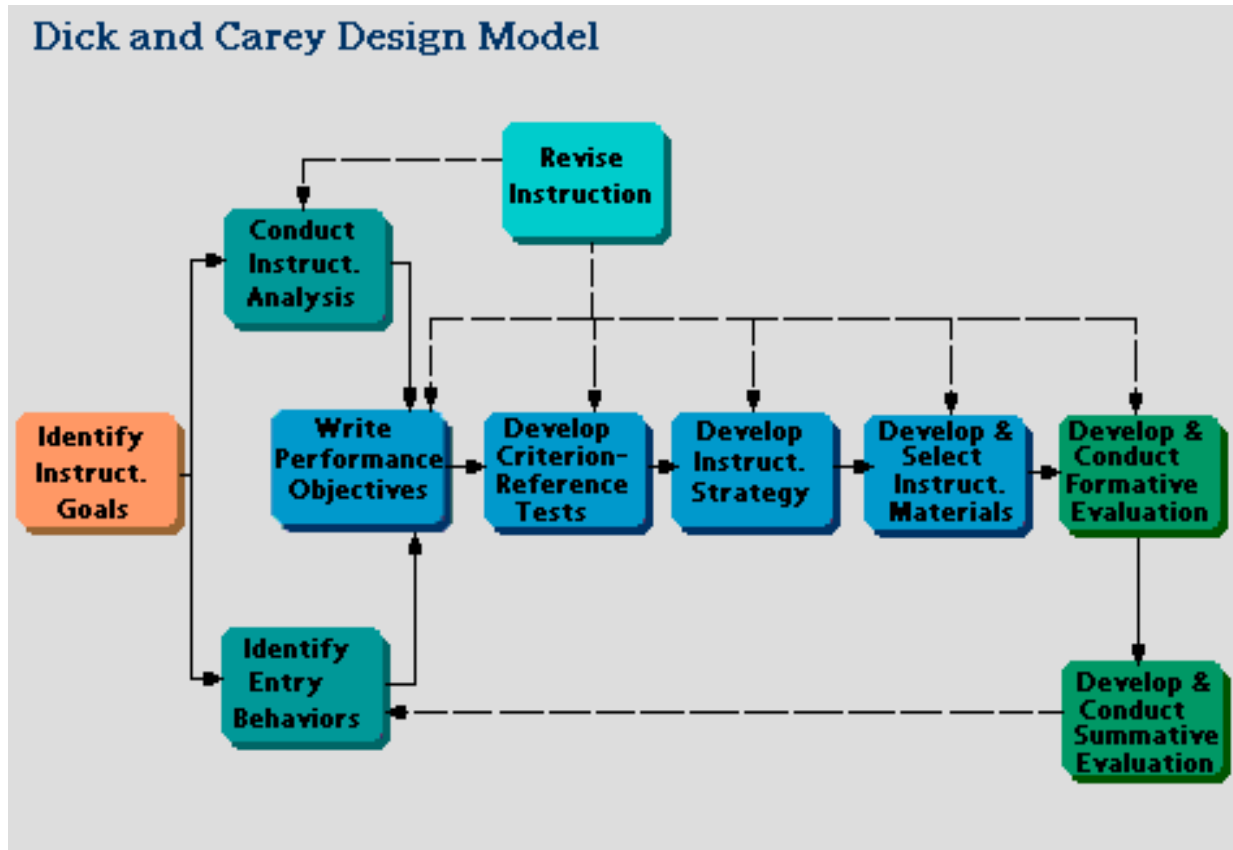
"Fig.1" The Dick and Carey model

(http://www.umich.edu/~ed626/Dick_Carey/dc.html)(Nov 18, 2007)

1.2   E-Learning Technology

Technology extends our abilities to change the world. Internet has brought about drastic changes in the way people work, communicate and entertain themselves. It is also poised to bring about paradigm shift in the way people learn. There are a number of advantages of using the Internet and the Web as a teaching tool. Increasingly, the Internet and WorldWideWeb are being used as support aids to facilitate the delivery of teaching and learning materials. The Web is becoming the world virtual library, where information on any subject is available. This is more efficient and cost effective compared to traditional classroom environment since students can access learning materials at any time and even students whose geographical reach have prevented them can now access the learning material. Educational domain is often engaged in massive and senseless duplication for re-creating the existing teaching materials.   (Herschbach, 1997).

Technology and technology education have been redefined over the years to take on an electronic connotation with today's definition referring more to computers and computer operated equipment.

A student's success in today's world requires not only basic academic skills but also social and collaboration skills, higher order and critical thinking skills, problem solving skills, fluency in

communicating in many modes and media, technical skills and the skill to initiate action (Fulton & Honey, 2002). The educator must decide the best medium for their students to attain these skills. Today, "Industrial technology educators must decide on how much technology they should use in their programs and which types of technology will prepare their students for the 21st century workplace" (Mosley, 2002,p. 30). Much of the current technology available is expensive and requires technical expertise to both install and maintain the equipment. Many of the decisions for educational technology are based on financial analysis rather than needs analysis.

However, with the increasing number of technology grants and the decreasing cost of electronic equipment, current technology is becoming more available to the education community.

Some of the current technology used in education today includes:

*A-**Computer Conferencing:*** Computer conferencing is an electronic vehicle that facilitates learning with dialog and interaction between an instructor and his or her student either asynchronous or synchronous (Gunawardena & Duphorne, 2001). Examples of asynchronous conferencing are e-mail between the instructor and the learner or posting messages and responses on an electronic bulletin board.

B-Virtual Technology: Virtual technology allows the learner to interact with an electronically generated artificial environment as if the environment was real. The virtual environment allows the learner to develop experiential knowledge from the interaction (Molnar, 1997). This technology can be used to implement problem-based learning into an electronic environment.

C-Wireless Technology*: Wireless access has improved the availability of the

Internet making it easier for users to retrieve and send information from anywhere their signal can be reached. This allows students not only to use their laptops in any room on campus that the signal reaches but also allows them to use benches and shaded lawns outside the buildings when they want to enjoy the weather on a nice day. This technology also allows student to access the internet via palm pilots and cell phones (Nasco, 2004).

Technology that is already available such as virtual reality will allow users to build three-dimensional models in computer graphics environments.

Medical students can perform surgery on simulated patients just as they would in a real situation (Emerson, 1999).

In their article, "A Vision of Education in the Year 2010," Cadena-Smith and Shelly (2002) discuss a typical student's day in the year 2010. The student reports to the Learning Center (school), hooks up his or her electronic notebook, and downloads his or her homework and any notes from his or her parents. The information is immediately processed and his or her schedule for the day's activities are uploaded based on his or her previous and current personal data. He or she then reports to his or her learning pod to start the day's activities with other students, either younger or older, and to receive instruction from his or her learning facilitator.

This type of education promotes learning centers focused on specialized areas of study with flexibility and personalized instruction for each student. Technology and technological instruction can allow this personal touch with large numbers of students. With the current trend leaning toward educating more students with less money, using technological resources will help the education process become more personalized with fewer financial resources.

D-Blended learning combines online learning with other modes of instructional delivery. The Innosight Institute defines blended learning as a combination of online and face-to-face instruction in which the student learns at least in part at a supervised brick-and mortar location away from home and at least in part through online delivery with some element of student control over time, place, path, and/or pace. 3

The Innosight Institute defines four models of blended learning (shown in Figure 2) as follows:

i-"***Rotation model*** – a program in which within a given course or subject (e.g., math), students rotate on a fixed schedule or at the teacher's discretion between learning modalities, at least one of which is online learning.

ii-Flex model – a program in which content and instruction are delivered primarily by the Internet, students move on an individually customized, fluid schedule among learning modalities, and the teacher-of-record is on-site.

iii-Self-Blend model – describes a scenario in which students choose to take one or more courses entirely online to supplement their traditional courses and the teacher-of-record is the online teacher.

iv-Enriched-Virtual model – a whole school experience in which within each course (e.g., math), students divide their time between attending a brick-and mortar campus and learning remotely using online delivery of content and instruction."
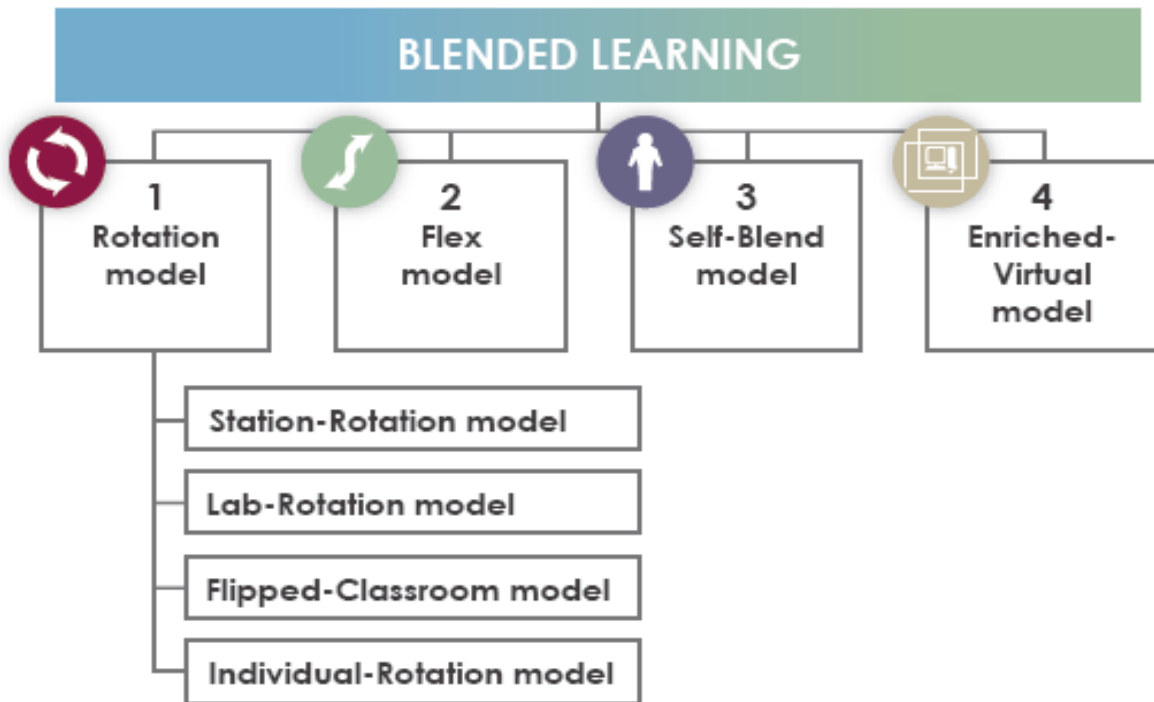
"Fig.2"   Blended learning models. Source: Classifying K-12 Blended

Learning, Innosight Institute, May 2012 (Amy Murin John Watson,2012)

1.3   Types of e-learning

There are two types of e-learning synchronous and asynchronous:

The terms synchronous and asynchronous are used to describe whether or not students attend instruction at the same time or at different times. In synchronous instruction the teacher and students meet at the same time. In face to face instruction this means that everyone is in the same room at the same time. In online instruction synchronous instruction occurs through the use of technologies such as chat, two-way video conferencing, or audio conferencing. Online instruction is more likely to be asynchronous allowing students to access and participate in the course when they choose

   Synchronous e-Learning is defined as   Computer-assisted training where the instructor and participants are involved in the course, class or lesson at the same time (synchronized). The term 'synchronous e-learning systems' has strengths in that it emphasises that one is dealing with a form of e-learning and that this is a synchronous form of e-learning. The term 'synchronous' differentiates this

form of e-learning from more traditional forms which are clearly asynchronous and gives the idea that one is dealing with a live event going on synchronously at a number of locations. The weakness of the term is its use of the cumbersome word 'synchronous', a term that is little used outside education circles. Synchronous means happening, existing, or arising at precisely the same time or recurring or operating at exactly the same periods or having the same period and phase. In digital communication it refers to a transmission technique that requires a common clock signal (a timing reference) between the communicating devices in order to coordinate their transmissions. It means occurring at the same time or at the same rate or with a regular or predictable time relationship or sequence.(p6)

Asynchronous e-Learning refers to learning materials that the learner can use *whenever* and *wherever* he or she wants. It connotes "on-demand" e-Learning; e-Learning that the learner can use when needed or when time is available. Asynchronous e-Learning is used by almost all of the *Guild* members who answered the survey questions about the modalities they use, and that makes lots of sense because a self-service, use-as-needed model of e-Learning has a lot of appeal both to management and learners(Patti Shank,2010)

The table below will show the difference between both types:

Synchronous vs. Asynchronous e-Learning		
Synchronous e-Learning	**Distinctive features**	**Examples**
	• Real-time • Live • Usually scheduled and time-specific (but can be impromptu) • Collective and often collaborative • Simultaneous virtual presence (with other learners and facilitators or instructors) • Concurrent learning with others	Instant messaging • Online chat • Live Webcasting • Audioconferencing • Videoconferencing • Web conferencing
Asynchronous e-Learning	Intermittent access or interaction • Self-paced • Individual, or intermittently collaborative • Independent learning • Usually available any time	E-mail • Threaded discussion • Boards • Web-based training • Podcasting • DVD • Computer-based

	• Recorded or pre-produced	training

Table.1.   Karen Hyder,Ann Kwinn, Ron Miazga,and Matthew Murray, 2007

1.4   Comparison between E-Learning and Traditional Classroom

Tsai and Machado review some of the predominant definitions of e-learning as: Much literature associates e-learning with Web-based learning over the Internet (e.g. Rosenberg, 2000; Driscoll, 2002; Horton, 2000). Schank (2001) refers to learning activities involving computer networks as e-learning, and stresses that e-learning is not merely distance learning. An agreement on how to define e-learning could help research and researchers go forward in identifying models and practices for applying e-learning and in determining the key factors for better and more effective use of this type of teaching and learning: "There is a pressing requirement to understand better the nature of e-learning, as an educational innovation, and to evolve contextually derived frameworks for change which align with organisational culture and practice" (Rossiter, 2007, p. 93). The challenge of finding a single, inclusive definition of e-learning is the starting point for this study. As Renold and Barter (2003, p. 91) stated, an inclusive definition is "a broader definition that encompasses a wider spectrum of the concept and can cope with the complexity of its representation/characteristics.

The idea of regularly scheduled classes attended at the community college or local university is not a feasible or desirable alternative for the non-traditional student's academic or technological advancement. Just as in any other type of learning situation, not all e-learners are alike.

Someone who enjoys learning, in general, will aspire in any learning situation yet some learning styles or personality traits seem better suited for the e-learning environment. Social aspects of the learner, self-motivational skills, and the learner's confidence with technology will all affect the level to which a student will prosper in the e-learning environment (Shepherd, 2002).

The non-traditional e-learning student does not have a daily classroom instructor to motivate and encourage him or her through difficult periods of a class. In a traditional classroom, a good instructor can sense when his or her students are becoming uninvolved or disinterested in the subject matter and can change gears by approaching the subject from a different angle (Eggen & Kauchak, 2001). A different approach to the subject can sometimes renew the interest of a student or the class, however in Web-based learning, this indifferent attitude is hard to appraise and even harder to counter because of the lack of on-site instructors.

Interaction among students and instructor has been a subject of study for many years; however, these studies have mostly been limited to the classroom (King & Doerfert, 1995). A simple model for communication as shown in Figure 3, requires a sender, a medium to send the message, a message to send, and someone to receive the message. In this simple model, the medium could be the sender's voice as in verbal communication, non verbal communication as in pictures or body

movements, a word processor as in written communication, or electronic communication including e-mail, chat rooms and video conferencing.
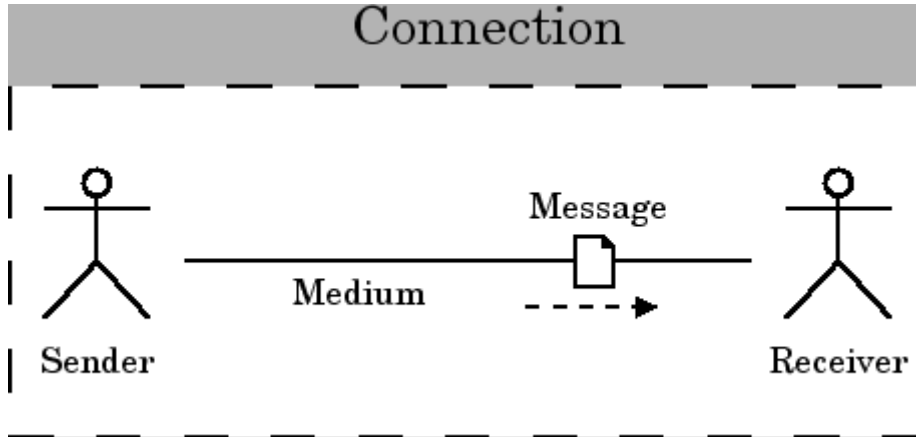
"Fig. 3" A simple communication model. (Bowers, n.d.).

When one communicates electronically, one adds a new dimension to the process (see Figure 4), which is the encoding and decoding of information. Depending on the medium used, the sender must encode the message so that the reader can receive and decode the message. In other words, the medium must be compatible to both users in order for the communication process to be complete.
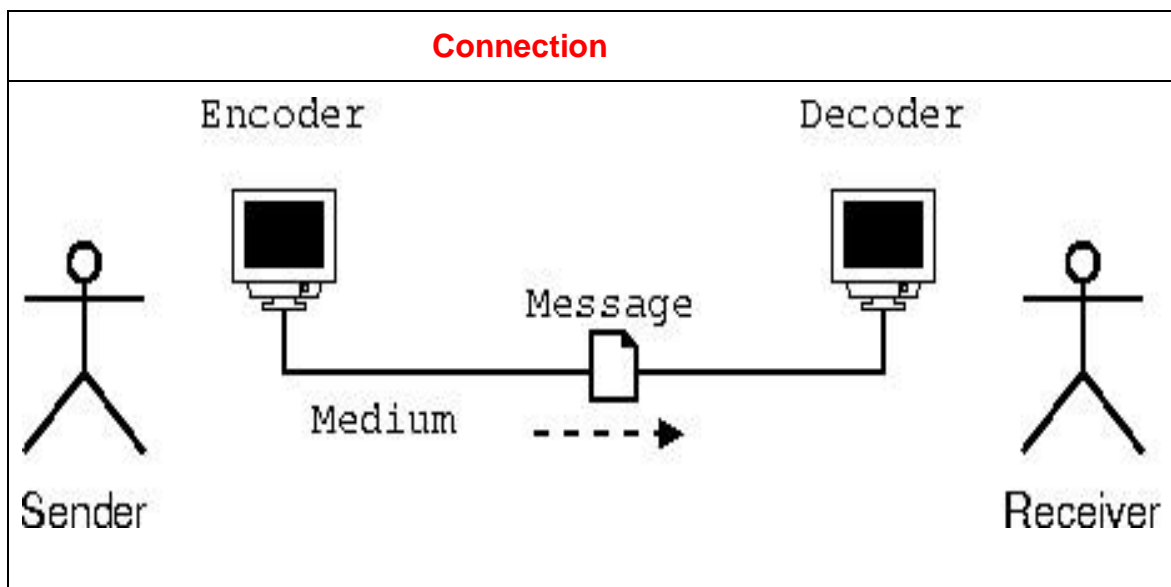
"Fig. 4" Communication model including electronic source (Bowers, n.d.).

There have been four interactive relationships associated with e-learning in a distance-learning environment: interaction between learner and content, interaction between learner and instructor, interaction between learner and learner (Moore, 1989), and interaction between learner and a technological medium or interface interaction (Hillman, Willis, & Gunawardena, 1994). Since all of these interactions are based on the comfort levels of the learner with the medium, the learner-interface

interaction is of vital importance in the distance learner environment. This interaction is less important or not present in traditional classroom instruction.

1.5   **The Merits of E-Learning**

Web-based learning with its "anywhere, anytime, anyplace" (Honey, 2001) aspect of education can be the answer to the non-stop schedules many individuals are challenged with in today's lifestyle. This is a way that even the busiest schedules can find time to advance themselves. With the current and future needs for technologically trained personnel to fill positions in the U.S. workforce, Web-based learning could provide the difference in having or not having the individuals needed in order to satisfy the necessary workforce requirements (Judy & D'Amico, 1997).

 Some of the most outstanding advantages to the trainer or organization are:

- *Reduced overall cost* is the single most influential factor in adopting e-learning. The elimination of costs associated with instructor's salaries, meeting room rentals, and student travel, lodging, and meals are directly quantifiable. The reduction of time spent away from the job by employees may be the most positive offshoot.
- *Learning times reduced,* an average of 40 to 60 percent, as found by Brandon Hall (*Web-based Training Cookbook*, 1997, p. 108).
- *Increased retention* and application to the job averages an increase of 25 percent over traditional methods, according to an independent study by J.D. Fletcher (*Multimedia Review,* Spring 1991, pp.33-42).
- *Consistent delivery* of content is possible with asynchronous, self-paced e-learning.
- *Expert knowledge* is communicated, but more importantly captured, with good e-learning and knowledge management systems.
- *Proof of completion and certification,* essential elements of training initiatives, can be automated.

1.6   **Discussion**

A Model for E-Learning Instruction

Much of the current electronic instruction is based on tutorial models, which present a page of instruction (normally in textbook style), ask questions about the instruction, and provide feedback to the learner (Merrill, 1987). A typical tutorial model ,is shown in Dick and Carey model, which shows the tutor or designer selecting information from the content, which he or she provides for the learner's access, the learner chooses from the available information and gets feedback from the programmed information.

Although this model is sufficient for review of information learned in prior settings, it does not incorporate the interactions necessary for learning and comprehending new information on a stand-alone basis. The tutor model could be used successfully in a traditional classroom as a review tool to help the learner study for exams or further the learning process.

Interaction between the learner and the interface is crucial in an e-learning environment. Many of the models mentioned above can be adapted to the e-learning instruction by adding steps to incorporate learner interaction into the process. The Dick and Carey model would work well for e-learning curriculum with minor modifications. The Dick and Carey model is used intact until the "Develop and Select Instructional Material" stage is reached (see Figure 5). At this stage, the curriculum would be evaluated for interface, content, e-learner, and instructor interaction with the e-learner. The process would then go back to revision and development until the evaluation fits the outlined objectives.

Dick and Carey Instructional Design Model
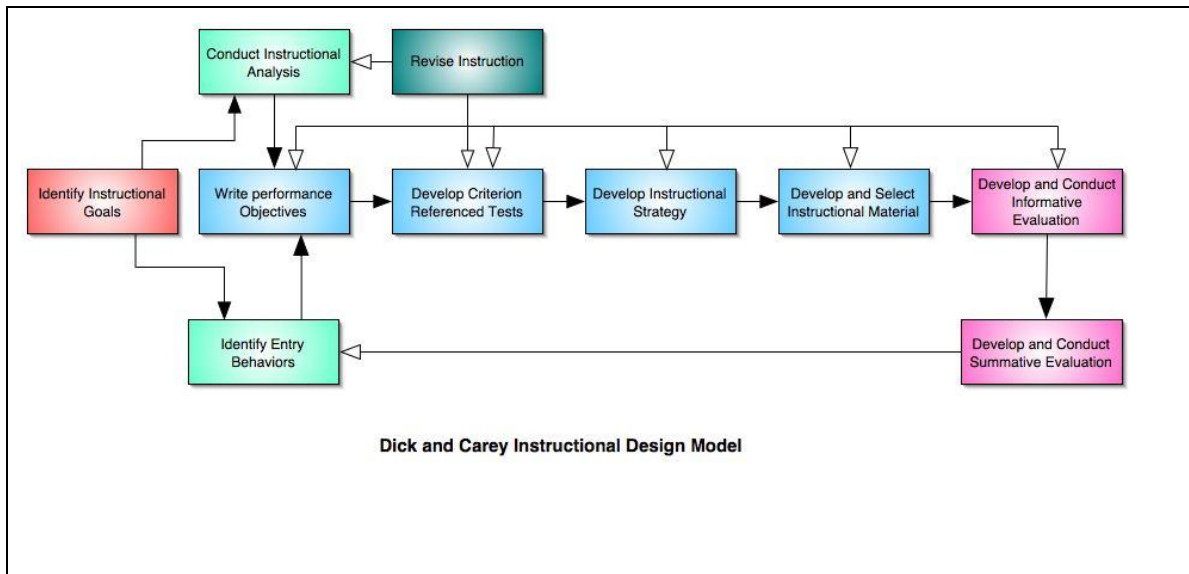
"Fig.5"   Dick and Carey model

http://www.nwlink.com/~donclark/history_isd/carey.html(Retrieved April 5, 2010)

Entrance into these steps comes at two different areas. The curriculum designer can enter the steps during the design and selection phase of the process so they can ensure that the instructional materials fit the criteria for the e-learning module or they can enter after the evaluation phase of the program to evaluate the effects of the e-learning module.

The order of design through these steps relates to a hierarchy this author believes is important to the design of the e-learning model. The technology should be first because of access issues and continual change of resources. If the technology is the most up to date, a learner may have entry problems into all aspects of the learning environment.

Adversely, if the technology is antiquated (which in today's world could be a few years) the training may not be as interesting or interactive as necessary to provide the needed training. Secondly, the content must work with the technology and be appropriate to the knowledge needed for the students learning. Content also changes fast in some fields so content must be examined from both the use of it though e-technology and the learning that will take place.

Content /Learner	Interface/Learner	Collaboration	Instructor/Learner
Instructional Resources	Type and ease of use of Technology	with other Learners	Guidance – Mediation

Table.2.   The Element of e-learning

Third of importance is the learner-to-learner interface. Learners must have multiple communication sources and be motivated to communicate among themselves.

One of the most important aspects of learning is the sharing of ideas among peers. This aspect is often overlooked in the e-learning environment and should be an import part of the design process. Fourth, but not to be slighted is the instructor-learner interaction.

Most e-learning programs have a system for instructor communication. This interaction must be easy with immediate feedback. Without ease of communication and feedback in a timely manner, students become frustrated and disinterested in the process.

Interface interaction could be accessed through e-learner satisfaction analysis based on surveys designed for responses pertaining to online features and ease of use of pilot programs (Gunawardena, Carabajal, & Lowe, 2001). E-learning programs can have tools built into the system to measure the time an e-learner uses the system and how many areas or features are used by each e-learner. Content assessment is an ongoing process and should be analyzed against the learning objectives for clarification.

E-learner or collaboration interaction evaluation can be built into the e-learning program to track time spent in chat rooms and responses to discussion topics. Collaboration can also be assessed with surveys geared toward perceived interaction during training. Instructor interaction can also be built into the system by tracking emails, instructor lead chat room attendance and participation, and instructor lead discussion topics. By doing these evaluations, the curriculum designer can re-evaluate the instruction, make changes and start the development process over to refine the e-learning product.

1.7   Conclusions

The paper has presented a model which is a combination of ideas from several authors and although not proven as a collaborative effort, the individual projects of each author have been tested and proven to be of use in the development of curriculum for educational purposes. The author of this article has taken the liberty of combining the models to design a model that would meet the criteria for the needs of a typical e-learning student. The model needs to be tested and further research performed to ensure the model will perform as stated.

E-learning is still in its childhood and many changes are expected in the near and distant future. Problem-based learning is a plausible format of the electronic learning process as well as customized and individualized training for academic and corporate education. Electronic education will see many changes in both equipment and software, and educators must be ready to utilize these innovations to train future learners in the most effective and time efficient methods to keep up with the demand for a highly trained workforce. The researcher tries to produce both the traditional and the e-learning curriculum to see the difference and merits and how to blend both in teaching

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