

Effective eLearning Design

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Abstract

Organizations have a need for effective training. Training designers have to be able to design effective eLearning to meet those needs. This is difficult because designing successful eLearning is part art and part science, involving the use of learning and training theory and an understanding of the knowledge and/or skills to be taught. The design also has to be completed within the constraints involved in all phases of the training design and implementation. Further complicating the process is the diversity of equipment, tools, and techniques involved. A final complication is the fact that there is no one-size-fits-all approach to the design of eLearning. Each course is unique. However, there is a general process whereby the designer balances the elements involved. If the designer does everything correctly, there is a greatly improved chance that the result will be effective eLearning.

Key Words: Benefits; improved learning; business productivity; Formats; Types; artistry; Tools; Techniques; Process; Technologies; Pedagogy; Instructional Design

Introduction

Businesses, industries, and government agencies have an ever increasing need for timely, appropriate, cost effective training. As a result of which, increasingly, training designers have the difficult task of designing effective eLearning to meet those sometimes conflicting needs. This task is difficult because as noted by Allen (2007), designing successful eLearning is part art and part science. It involves the appropriate utilization of learning and training theory, a solid understanding of the electronic designs tools and equipment, coupled with an appropriate understanding of the knowledge and/or skills to be taught. It also requires a blend of color, style, sound and video usage in a manner that educates while entertaining the student without distracting from the learning experience. Such utilization is not simple however. As Kanuka (2006) stated, "...the 'art' of instructional design actually relies on the instructional designers' tacit knowledge and subject matter experts' gut instincts" (p. 6). However, the successful artistry requires both the balancing and blending of all the elements involved, and the translation of the subject matter experts raw understanding into understandable knowledge. In addition, the design has to be completed within the various real-world technological constraints involved in each phase of the design, development, and delivery of instruction.

A further complication is the wide diversity of equipment, tools, and techniques involved in each phase of eLearning. To address these issues Horton and Horton (2003) suggest a systematic evaluation (in terms of cost, reliability, and ease of use) of the equipment, tools, and techniques in order to select the best mix for each particular need.

A final complication with the eLearning design process is the fact that there is no one-size-fits-all approach to the design of eLearning. Each organization and each course design has its own unique constraints, challenges and objectives. As Clark and Mayer (2008) noted however, there is a general process whereby the designer balances the training goals, learner differences, and the training environment. The purpose of this paper is to describe the design of effective eLearning.

Discussion

The primary purpose of any organization is to survive. In order to succeed in this effort, they all strive to utilize the most cost-effective and efficient methods. Furthermore, because every organization has at least one person, in one form or another every organization has a need for some type of training. So one of the significant questions every organization has to contend with is how to best address their training needs. As noted by Allen (2007) eLearning is not well suited for teaching all interpersonal skills (i.e. various personal communications and anger management skills where vocal, facial expression and body language play a significant part in the communications itself). eLearning is also not well suited for teaching original thinking. However, properly designed and implemented eLearning can effectively and efficiently meet an organizations factual, theoretical, logical, and procedural training needs. As these types compose the vast majority of any organizational training needs, it is apparent that this method of training can be very well suited for organizational training.

An organization benefits in many ways from the use of eLearning. Among those benefits is the fact that eLearning courses save on travel, administration, and facility costs. There is also a significant savings realized in less time away from work. More importantly, effective eLearning results in improved learning and improvements in business productivity.

Furthermore, Allen (2007) stresses that, as noted in the widely accepted theory of Educational psychologist William Glasser, we learn:

- 10% of what we read
- 20% of what we hear
- 30% of what we see
- 50% of what we see & hear
- 70% of what we discuss with others
- 80% of what we experience
- 95% of what we teach someone else

Based on this scale, eLearning that includes student interactivity and personal involvement in the learning process has the potential to successfully deliver the highest student learning possible (just short of them teaching someone else). Thus, eLearning can be highly effective, if designed properly. But just what is eLearning?

Definition of eLearning

What eLearning Is

There are numerous definitions of the word “eLearning”. These range from Wikipedia’s “Electronic learning (or e-Learning or eLearning) is a type of education where the medium of instruction is computer technology”, to “The use of computers in a systematic four step process: presented (Step A), practiced (Step B), assessed (Step C) and reviewed (Step D)” (Brown & Voltz 2005). All have valid points. However, because it ties the organizational training objectives directly to the training, This author feels the best definition is provided by Clark and Mayer. According to Clark and Mayer (2008), eLearning is any instruction that is delivered on a computer which has the following characteristics:

- Includes content relevant to the learning feature.
- Uses instructional methods such as examples or practice exercises to help learning.
- Uses a variety of media elements to deliver the content and methods.
- Builds new knowledge and skills which are linked to improved organizational performance.

Thus, the goal of eLearning is to build transferable skills and abilities.

Types of eLearning

It is important to also understand the various types of (or ways to present) eLearning. It is easy to simplify the course creation process by identifying up front the best way to present the eLearning training

material. Toward this end, Clark and Mayer (2008) present the following list of the variety of eLearning types:

- Standalone courses: Courses designed for the solo learner. Consists of self-paced training with no instructor or classmates.
- Virtual-classroom courses: Online class structured similar to a normal classroom course. May include synchronous online meetings. Includes instructor interaction of some kind.
- Learning games and simulations: Learning activities involving simulated activities.
- Embedded e-learning: Learning activities imbedded in other programs or processes (such as a computer program help feature, or a troubleshooting process or procedure).
- Blended learning: As the name implies, these are a blend of various forms of learning activities. These may include classroom, learning experiences, and e-learning or various forms of e-learning or some combination of all three.
- Mobile learning: Courses that utilize use of mobile devices such as PDAs and smart phones.
- Knowledge management: eLearning courses used to educate large groups rather than individuals.

Each eLearning type has its particular advantages and disadvantages. Furthermore, there are a variety of eLearning formats.

eLearning Formats

eLearning consists of a variety of media formats:

- Audio - MP3's, cassettes, CD's
- Collaborative - shared digital spaces such as interactive boards;
- Electronic text - webpage's, eBooks, electronic documents
- Integrated - Using combinations (possibly in a single interface)
- Software - simulations, complex interactive animations
- Video - digital (CD, DVD), VHS, streaming video
- Visuals - pictures, diagrams, simple animations
- Other types (electronic Braille devices, etc).

Each format has its good and bad points. It is up to the eLearning designer to select the one that best matches the particular training needs and that will work within the real-world constraints and organizational limitations, while providing the best educational experience possible to the students. This brings us to the features of effective eLearning.

Features of Effective eLearning

Characteristics of Effective eLearning

To be effective, eLearning must meet certain criteria. As noted by Angeliki, Asimina, and Eleni (2005), in general effective eLearning has the following characteristics:

- Successful in reaching learning objectives
- Easy accessibility
- Consistent and accurate message
- Easy to use
- Entertaining
- Memorable
- Relevant
- Reduced training costs

That is not to say that effective eLearning always has all of these characteristics. For example, the cost of effective eLearning can exceed the cost of other types of training but still be acceptable to organizations due to the overall savings in employee time, travel and other areas. To succeed, the designer must properly balance the various factors involved in order to create an effective eLearning course/learning experience. Once these characteristics have been dealt with, the next issue that has to be addressed is the appropriate components of effective eLearning.

Components of Effective eLearning

As noted by Brown & Voltz (2005), instructors need to use a variety of techniques in order to meet the various learning styles of their participants. To meet this need, Brown and Volt propose using three components for effective training in the training design:

1. Content (the training material). This includes all the training material used during instruction, such as:
 - Job Performance Aids: Job Instruction sheets, reminders and lists of steps for performing a task.
 - Technical documents and manuals.
 - Flowcharts and schematics.
 - Reference books and manuals.
 - Programmed text.
 - Multimedia computer programs.
 - Computer Aided Instruction, programs and other electronic files.
2. Experience activities (the learning activities, games, exercises). These include any activity that has the student performing simulated activities that require exploration and lead to discoveries relating to the learning objective either directly or indirectly. These also serve the purpose of keeping the students involved and interested.
3. Feedback activities (the programmed comments and reflections). These can be used to reinforce a particular lesson learned, correct errors and omissions, and they can inform the student as to their progress to a particular point. These also can repeat a particular section of lesson if the student experiences too much difficulty retaining the skill, knowledge or ability.

As Rose (2006) suggests, the designer should utilize equal proportions of the three components, and in various orders throughout the lessons in order to maximize learning.

But these are just the features of effective eLearning. What has to be determined before you can select, design and implement these features is just what tools, techniques and technologies best meet the various needs and constraints.

Effective eLearning Tools, Techniques, and Technologies

Companies and industries have developed an almost countless number of unique eLearning tools, techniques and technologies to help in the design of eLearning. So the major problems that an eLearning designer faces is selecting those that best meet their needs and constraints. Horton and Horton (2003) provide a comprehensive guide to the currently available commercial e-learning tools, techniques, and technology.

Identifying Appropriate Tools, Techniques and Technologies

As Horton and Horton (2003) point out, people, not technology, create and use eLearning. There are three specific categories of people involved in eLearning design and utilization: producers; hosts; and the learners. The producers consist of the authors, designers, illustrators, programmers and other creative individuals involved in the design and creation of the eLearning. The hosts consist of the organizations and equipment utilized to present/provide the eLearning to the learners. The learners are the users (students, readers, and/or workers) of the eLearning.

Each of these categories of people has specific technology requirements. As Horton and Horton (2003) recommend, the learner's technology has to be the driving factor in the determination of which technology and technique to use in the design and hosting activities.

For example, say it is determined that the learners will use their company computers to take and complete the eLearning. It is furthermore determined that most company computers are at remote locations with slow access and limited bandwidth connections. Then the designer must ensure that the eLearning that they develop does not require extensive bandwidth.

Selecting Appropriate Tools, Techniques and Technologies

In addition to consideration of the various types and categories of e-learning and the technologies required for each, Anaraki, F. (2004) points out that the requirements and products used in the various stages involved (designing, offering and accessing e-learning) must also be kept in mind. Horton and Horton (2003) provide a systematic process to the evaluation of the commercial products to assist the user in the selection of the best product for their particular needs (in terms of cost, reliability, ease of use, availability, etc). This is accomplished by systematically identifying and properly weighing user constraints and requirements (i.e. time required for the typical user to learn how to use the product vs time available for the entire development process; budgetary limits vs product costs, etc) and evaluating the various products against the resultant criteria. Which bring us to the art of effective eLearning design.

The Art of Effective eLearning Design

Design Process of Effective eLearning

As Allen (2006) points out, there are various concepts and techniques that are required to successful design e-learning applications. In particular, the present-day instructional design scenarios and the decisions which are involved at various points in the design process which he presents provide insight into appropriate design concepts and techniques.

To be successful, the eLearning designer must have some knowledge of the origins of the design techniques they choose to use. Allen (2006) identifies and discusses the various theories and approaches (Behaviorism, Cognitivism, Constructivism, etc) that led to specific design techniques. The eLearning designer also needs to use appropriate design and development techniques in the three phases involved in learning: Pre-instructional; Instruction; and Performance. A primary concern is how to do this properly within the time constraints imposed by organizations.

The most successful method in use today is called "Successive Approximation". This is an iterative approach whereby the designer repeatedly applies a three step process of design, prototype, and review in a rapid but controlled process to produce quick but appropriate eLearning.

Allen (2007) provides a rapid but comprehensive process involved in the design of effective e-learning applications in three parts. Part one presents various scenarios that illustrate the organizational challenges involved in e-learning design. In part two he presents various traditional applications, development problems, issues and why the traditional methods failed. In part three he presents an iterative approach methodology using rapid prototyping and dynamic design techniques.

If time is not a major factor, there are more traditional approaches to eLearning design. Clark and Mayer (2008) present empirically researched and proven guidelines for the proper design and implementation of e-learning applications. They present and explain how best to apply the eight primary multimedia instructional principles: Multimedia (Using a variety of media techniques); Contiguity (creating an association between known and new information); Modality (increasing comprehension by using audio narration to explain a visual presentation); Redundancy (using repetition) ; Coherence (using logical and orderly and consistent relation of parts); Personalization (using personal interests such as taste in music to increase student attention); Segmenting (divide lessons into smaller, easier to grasp segments); and Pre-training (reading or other assignments before start of training). They provide guidelines and examples of the best use of audio, visual, and text. They also present guidelines in the applicable instructional methods and approaches to use. But just as a beginning cook may be able to make an edible cake from a cookbooks directions, it takes a chef with artistry to make a divine meal from the same ingredients.

The Artistry of Effective eLearning Design

Thus, both of the design processes just presented will work. But only if the eLearning designer employs the proper amount of artistry to the effort, for a certain amount of artistry is required.

As Glaser (1962) points out, there is a significant difference between training and education (pp. 4-5):

- Training: The end-products of learning can be specified in terms of particular instances of student performance (precision of behavioral end-products are specified. This implies a

certain level of "uniformity."

- Education: The end-produce behaviors cannot be specified precisely because they are too complex. Maximize individual differences.

Glaser also notes the importance of getting and keeping the students interest and attention. This is not an easy thing to do in the best of training situations, and is especially difficult when using eLearning because there is no instructor present who can notice and address inattention, disinterest, or other problems that the students may exhibit.

This is where the artistry enters the picture. For the eLearning designer has to anticipate all, or as much as they can of these problems and issues and design the eLearning experience in such a way as to overcome them. At the same time, they also have to ensure to reach the designated training objects. They do this by the skillful blending of the characteristics and features inherent in the eLearning environment selected.

An artistic touch is also required in the style and blending of the various presentation methods, rates, pace, colors, media, and the thousand-and-one other factors that go into the design of effective eLearning .

A significant artistic challenge that must be consciously recognized and resolved by eLearning designers is the appropriate use of the technological features. As Cooze & Barbour (2007) noted, the major mistake that many eLearning designers make is getting carried away with the technical capabilities presented by the various Learning formats. The concept they discuss, known as "Death by Power Point" (where the "special effects" not only take away from the learning but interfere with it) is an issue in all the eLearning formats.

Conclusions

Organizations have a need for effective training, and training designers have to be able to design effective eLearning to meet those needs. This is a difficult task however because designing successful eLearning is part art and part science. Effective eLearning involves the skillful use of learning and training theories. It also requires an understanding of the knowledge and skills to be taught. The design process must also take into consideration the constraints involved in all phases of the training design and implementation. Further complicating the process is the diversity of technological equipment, tools, and techniques involved. A final complication is the fact that there is no one-size-fits-all approach to the design of eLearning, because each course is unique, and each design process requires artistic input at various points. However, there is a general process whereby the designer can identify and balance the elements involved. If done properly, the result is effective eLearning.

Recommendations

eLearning designers require extensive education and training. To gain the basic skills, knowledge and abilities required in the use of learning and training theory, eLearning designers should complete training in education and instruction design. They also should study the methods, processes and procedures provided by experts in the field of eLearning design. They need to become knowledgeable about the diversity of technological eLearning equipment, tools, and techniques involved. In addition, they need to gain practical experience in designing effective eLearning. With practice, and study, over time eLearning designers should be able to develop the practical and artistic skills and abilities required to design effective eLearning.

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