Five Technological Considerations When Choosing an E-Learning Solution

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E-learning is first and foremost about learning. Without a focus on the learner, the learners' needs, and the aptitude of the learner, e-learning cannot take place. However, the enabler for all this online learning is technology. An online learner cannot learn if he or she is encountering technical difficulties.

To make e-learning successful, the technology must have several characteristics that make the learner's and the instructor's experience enjoyable. Nothing dampens a new e-learner's enthusiasm more quickly then technological glitches or kills an instructor's drive to work online like difficult-to-use software.

This article looks at different e-learning technologies and briefly discusses the pros and cons of each. It then explains five technology characteristics that you should look for when selecting an e-learning solution.

Regardless of whether your focus is academic or corporate, you should look for the following five characteristics to aid you in choosing an e-learning program that supports instructors and learners.

E-Learning Technology

There is a continuum of e-learning software with simple HTML on one end of the spectrum and complex, enterprise-wide Learning Content Management Systems on the other. One of the secrets to successful e-learning implementations is to choose the correct software for the correct need. The e-learning software must satisfy the needs of the online learner, the online instructor and, in many cases, individuals in an administrative capacity who must track and maintain learner records. Generally, there are five types of e-learning software that can be used alone or in combination. These are:

• Programming Languages
• Authoring Packages
• Learning Management Systems
• Content Management Systems
• Learning Content Management Systems

Programming Languages: The most common programming language for online learning is Hyper Text Mark Up Language which is better known as HTML. It is possible to develop a simple, online lesson using straight HTML. However, the use of straight HTML does not provide for a high level of interactivity or interaction on behalf of the learner. Most online learning sites that are based on programming languages add items like Java, JavaScript, PEARL, or even CGI scripting to increase the level of interactivity between the learner and the software. Programming languages provide a great deal of flexibility and freedom to the developer when creating online learning. The difficulty is that maintaining customized sites and developing in a programming language can be a cumbersome task for an instructor. In addition, most instructors don't know enough programming to develop an effective site.
**Authoring Packages**: These packages are designed specifically to overcome the difficulty most instructors have with using programming languages. Most authoring packages are visually oriented so the learner doesn't need to know any coding. The software performs the coding "behind the scenes." All the instructor needs to worry about is placing the correct information in the right place. He or she inserts an image, highlights text or moves objects around the screen with a mouse. The software takes care of coding interactions and functionality in the background.

These authoring packages include Macromedia’s Dreamweaver and products like TrainerSoft and Lectura. More and more of these packages are being made available by various vendors.

A drawback of many of these packages is their inability to track and monitor the performance of a multitude of learners over time. These packages are typically designed for the creation of a lesson and immediate feedback to the learner but not for long term storage of performance data.

In addition, most of these authoring packages do not have features that enable interaction in "real time" between and among students. These packages don't have chat rooms, threaded discussions or two-way audio features. They are limited in terms of learner interactivity.

**Learning Management Systems (LMS)**: These systems are specifically designed to track the performance of a multitude of learners. They can be academically focused like Blackboard, e-College, or WebCT, or more focused toward corporations like Docent, Saba, and Click2learn's Aspen. There are literally hundreds of academic and commercial Learning Management Systems from which to choose. The commonality among LMS e-learning platforms is that they can track and store user performance on built in assessment; they can track the number of hits to a certain area of the site; and they can track the amount of time a learner has spent in a certain area of the course.

These systems allow learners to register for courses. Once registered, the system will automatically send reminders to students to take a required online class. These systems allow for the management of most administrative functions. Students can check grades, turn assignments into virtual drop boxes, chat with other students, and participate in special group areas where only designated group members can enter.

**Content Management System (CMS)**: While it is critical that learners are managed properly, another management issue with online instruction involves the tracking and cataloging of graphics, sound files, video files, and text files.

A CMS helps instructors catalog, track, and manipulate content used in online courses. For an individual instructor or a person working alone, content management is usually not a critical element. The instructor has some CD-ROMs or content on their workstation and simply remembers where a certain file is stored. When multiple instructors are creating courses, the task of managing content becomes more difficult.

A CMS is a database of content which is assigned keywords and extensive search capabilities so that an instructor or developer can easily locate what he or she is seeking. The instructor might type the key words "business person" and receive a listing of photographs, line art, and video clips all containing individuals in a business setting.

A CMS is effective when large numbers of instructors are all focused on developing courses and have a desire to reuse content in a variety of courses. Reusing content cuts down on development time because, instead of creating a new image of a business person, the CMS allows the instructor to simply find an existing image.
Learning Content Management Systems (LCMS): These systems are simply a combination of several types of e-learning software. Most LCMS provide the capability of tracking users, the ability to author content, and the ability to store and retrieve content when needed. These "mega" packages allow an organization to have an enterprisewide solution that takes care of every e-learning software need.

If the systems are implemented properly and used appropriately, they can be cost effective. Unfortunately, many times these systems are implemented into organizations without a clear understanding of how they will be used and without a plan for maximizing the functionality of the system. To effectively use an LCMS, training and instruction must be provided.

Five E-Learning Software Characteristics

Regardless of what level of software you choose for your e-learning solution, you need to consider five characteristics. These are maintainability, compatibility, usability, modularity, and accessibility. Each of these characteristics is critical for success. It is important to note that, in reality, many of the characteristics overlap. However, looking at the five characteristics individually helps to ensure a broader understanding of the technological needs of e-learning solutions.

1. Maintainability: The ability to maintain, over the long-term, your e-learning technology is critical. If it is difficult to add new users or delete old ones, hard to add content or inconvenient to recycle quizzes, instructors are going to abandon the technology quickly. In addition, if it is hard to perform updates or increase the sever capacity, problems will arise. You do not want to be at the mercy of a vendor for maintenance, changes, and alterations to your e-learning.

   The system should be easy to administer and should be simple to update course content using pre-existing templates. Look for e-learning software that separates content from structure so you can update content without accidentally deleting critical navigational or menu items. Check out the help system to make sure that it is, indeed, helpful.

   Examine the software. Make sure you are comfortable with maintaining both the content and the software itself. Look for the ability to recycle a course by removing users and test results but not course content. If a course is used over and over again, you want features that allow you to quickly move the old learners out and the new learners in. You also want the ability to archive records of past learners.

2. Compatibility: Look for a solution that is compatible with other e-learning solutions on the market. You do not want to end up with a proprietary product that links you and the e-learning vendor together for life. Select a vendor that uses software and standards that are widely recognized. While it is impossible to have a solution that is "compatible with every known LMS or standard on the market," it is possible to choose e-learning solutions that are widely recognized and utilized.

   Even though several groups are all vying for the right to claim to have the standard in e-learning, you can still make choices that ensure some level of interoperability. First, you need to determine which of the standards are most relevant for your situation. Ask questions like:

   - Do we need to move content from one Learning Management System to another?
   - Are we creating content to be placed into many learning management systems?
   - Are we going to use the authoring package that comes with the LCMS we purchased?
   - Do we need to find employees who can quickly create courses using this software?
One way to ensure compatibility is to seek e-learning software that adheres to certain standards that are emerging within the e-learning industry. The basic ideal behind e-learning standards is to allow one vendor's e-learning modules to share information with another vendor's module. Standards allow e-learning modules to easily share information with LCMS or LMS systems. If all vendors adhere to the same standards, a learning module or learning object can be used interchangeably in multiple LMS or LCMS systems.

There are several organizations which are developing standards. These organizations are the AICC (Airline Industry CBT Committee), the quasi-governmental organization Advanced Distributed Learning (ADL) who is working on SCORM (Sharable Content Object Reference Model), and IEEE (Institute of Electrical and Electronics Engineers).

The most comprehensive is the SCORM project which encompasses many of the other standards. The important element in looking for compatibility is to understand that compliance with a standard like SCORM doesn't automatically ensure interoperability.

Interoperability is the ability to take one learning course and use it in many different learning management systems seamlessly. The standards are currently ONLY guidelines for interoperability and can still be interpreted differently by different vendors. It is important to know what types of courses you want to interact with your LMS, so determine from the vendor whether or not those courses can function with their LMS. Don't take it for granted that a SCORM compliant course automatically links with a SCORM compliant LMS.

3. Usability: Another technical issue you want to address is that of usability. You want to be assured that the e-learning solution is easy to use. This is important because if technology is seen as cumbersome or difficult to navigate, the potential learners or instructors will never use it. You want the software to be intuitive. It should be easy to find the help menu, easy to move from one section of the course to another, and easy to have communications with the instructor.

Instructors are not going to want to read a huge, thick manual to be able to understand how to create instruction. Or spend hours trying to figure out how to create a quiz. The software needs to be simple and straightforward. This is true not only for the instructor and learners but for the administrators as well.

4. Modularity: E-learning solutions can now be developed as small interchangeable knowledge objects. A knowledge object or learning object is small piece of instructional content. It is a small chunk of self-contained information that can be reused as necessary to meet the instructional needs of the learner. Learning objects are small pieces of instruction that can easily be moved from one course, lesson, or program to another completely different piece of e-learning. The idea is to reduce development time because once you develop the learning object, you can reuse it again and again.

The analogy most often used for learning objects is one of plastic, interchangeable blocks. Each learning object is self-contained but can easily be added to or subtracted from similar pieces, just like Lego blocks. These blocks can be snapped together, unsnapped and re-arranged in different configurations regardless of their size or color—they are all interchangeable.

If you are considering reusing bits and pieces of your course materials, you need an e-learning system that supports this type of functionality. Look for systems that allow you to determine the learning objects and that require the instructor to link the learning objects to specific learning objectives.
5. Accessibility: This can cover two layers. The first layer is that the e-learning program is accessible to all individuals regardless of physical obstacles. This may mean that your e-learning software conforms to the Americans with Disabilities Act (ADA) Section 508 standards. This can be required when you are doing work for the federal government. You may need to make sure your e-learning is compatible with screen readers. Screen readers are software that literally reads the words on the Web page to an individual who is unable to see the text.

While most of the screen readers do an excellent job of reading text, an instructor or course developer can make it easier on the learner by following certain conventions. One such convention is to add an alternative tag to each graphic to explain the purpose and meaning of the graphic.

Second, you have to make sure that the technology you are purchasing is available to all the users. For example, if some of your learners do not have the latest Macromedia Flash plug-in, then the learners won't see your brilliant simulation you created using the latest version of Flash, or if the table structure you use is for a 5.0 browser and your students have a 4.0 browser, they may not be able to access the information they need.

You need to know that your learners can gain access to e-learning without any technical obstacles. Your e-learning software solution needs to be checked in the browsers that are going to be used by the learners. You need to check several scenarios to make sure e-learning works when it should on the platforms it should. It is best to check the solution on a few representative machines or workstations rather than rolling out to 40,000 people only to have it fail. If you can't control the technical environment of the learners, you must make strong recommendations about the configuration of their equipment.

Conclusion

The electronic portion of e-learning is critical to the success of the student and to the online program. Consideration must be given to the type of e-learning software you want to employ to reach your learners. Your e-learning solution might range from developing a simple Web page to add value to a class or it may involve a full-scale Learning Content Management System that includes learning registration as well as course development.

Regardless of the solution needed, you must consider five elements of any e-learning technology. If you consider the elements of maintainability, compatibility, usability, modularity, and accessibility when choosing your e-learning software, you will have a smoother more effective e-learning implementation.

Careful consideration to the type of e-learning solution you need to meet the needs of learners, administrators, and instructors will help ensure e-learning success. Let the instructors and learners focus on the learning and not the "e."

About the Author

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