Chapter III

Technology Requirements of Online Teaching / Learning Systems

INTRODUCTION

The previous chapter introduced the general instructional technology theory and went through the application of the ADDIE model for the development of an online teaching/learning system and online course materials. It also analyzed the requirements of an online teaching/learning system and provided the procedures to collect the requirement related information. The requirement analysis is covered by the first phase of the ADDIE model. This chapter translates the requirement related information into technical terms.

To meet the requirements, we need to investigate what technologies can be used. An online teaching/learning system is heavily dependent on technology. Various technologies are used to construct the online teaching/learning system and are used as course content to be taught in different technology-based courses. The first type of technology that is used to develop the online teaching infrastructure is the one that hosts the course content and supports users in accessing the online course materials. The second type of technology is the one that can be used to develop course materials including the interactive, collaborative, and multimedia content. In our case, the technologies used to implement the infrastructure and to assist the development of course materials will be the open source technologies. Therefore, our discussion in this chapter is to analyze the technology requirements by both

the online teaching/learning system infrastructure and the online course material development.

Let us start with the technology requirements for computer systems. We will include the requirements for network servers, application servers, and client-side computers such as desktop, notebook, and hand-held devices. The requirements for the operation systems and system management tools will also be discussed.

The next topic is the requirements for networks. An online teaching/learning system is a network based system. We will analyze the technology requirements by each type of infrastructure designed for each type of online teaching/learning system. The discussion will include the requirements for network equipment, network protocols, remote access instruments, and network management tools.

Then, we will look at the requirements for a learning management system. We will consider what services should be provided to manage various types of online courses. A learning management system also provides various tools for class management, collaboration, and presentation of course materials. We will discuss how these tools will be used to meet the technology requirements.

After the discussion of the learning management system, our next task is to analyze the requirements for other application software such as database management systems, programming languages, and office production software. The requirements for virtual machine related technologies and management tools are also considered here.

The last topic in this chapter is the analysis of the requirements for collaboration and multimedia tools for the development of online course materials. The needs for commonly used Internet based communication tools such as the media player, text messenger, Web server, Web browser, and Web conferencing will also be briefly talked about under this topic.

For each of the above requirements, the discussion will be based on the type of infrastructure or the type of course material used in the online teaching/learning system. The requirements identified in this chapter can be used as the system configuration guideline in later chapters.

BACKGROUND

Technology is the driving force of an online teaching/learning system. It is often the most challenging part to deal with. Not only does the computer service department need to use technology to construct the system, but also the students, faculty members, and staff members have to depend on it for online teaching and learning. Properly identifying the technology requirements is a critical step in developing

Related Content

Integrating Technology and Research in Mathematics Education: The Case of E-Learning
Giovannina Albanoand Pier Luigi Ferrari (2008). *Advances in E-Learning: Experiences and Methodologies (pp. 132-148).*
www.irma-international.org/chapter/integrating-technology-research-mathematics-education/4736

Promoting the Physical Sciences among Middle School Urban Youth through Informal Learning Experiences
Angela M. Kelly (2013). *Approaches and Strategies in Next Generation Science Learning (pp. 184-204).*
www.irma-international.org/chapter/promoting-physical-sciences-among-middle/74097

Exergaming as an Alternative for Students Unmotivated to Participate in Regular Physical Education Classes
Mateus David Finco, Eliseo Reategui, Milton Antonio Zaro, Dwayne D. Sheehanand Larry Katz (2015). *International Journal of Game-Based Learning (pp. 1-10).*
www.irma-international.org/article/exergaming-as-an-alternative-for-students-unmotivated-to-participate-in-regular-physical-education-classes/130628

Using Scratch with Primary School Children: An Evaluation of Games Constructed to Gauge Understanding of Programming Concepts
Amanda Wilson, Thomas Haineyand Thomas M. Connolly (2013). *International Journal of Game-Based Learning (pp. 93-109).*
www.irma-international.org/article/using-scratch-primary-school-children/77318

Using Game Mechanics to Measure What Students Learn from Programming Games
Jill Denner, Linda Werner, Shannon Campeand Eloy Ortiz (2014). *International Journal of Game-Based Learning (pp. 13-22).*
www.irma-international.org/article/using-game-mechanics-to-measure-what-students-learn-from-programming-games/117696