Chapter II
Instructional Technology Theory for Online Teaching/Learning System

INTRODUCTION

In Chapter I, a brief introduction to open source tools is presented. The discussion indicates that open source tools are necessary for an online teaching/learning system. As mentioned in Chapter I, this book will use the ADDIE model as a guideline for the development of an online teaching/learning system and online course materials. Along with the development process, the open source tools will be introduced to accomplish the tasks in each phase of the development.

Chapter I points out that it is possible to use open source tools to develop an entire online teaching/learning system. However, the development process is complicated and involves various technologies. Therefore, before an online teaching/learning system can be implemented, it is necessary to carefully design such a system and the development process should be thoroughly planned. The theory of instructional technology provides a guideline for developing a successful online teaching/learning system. It will be beneficial for the development of an online teaching/learning system if the developers of the system know how to apply the instructional technology theory to the development process.

In this chapter, we will discuss the issues related to planning and designing an online teaching/learning system. A more systematic approach will be discussed for...
developing online teaching/learning system projects. We will start with the general theory of instructional design. The discussion will show the big picture about an online teaching/learning system development process. We will have an overview of the stages of an online teaching/learning system development process, which provides clues for what to accomplish in the development process.

The first stage in the theory of instructional technology is the design stage. There are three phases at the design stage, conceptual design, logical design, and physical design. The conceptual design phase is about collecting information of users’ views and requirements about the project. The users in our project are university administrators, faculty members, staff members, and students. Once the project designers obtain the information they need, the next phase is to translate the users’ views and requirements to technical terms and to model an online teaching/learning system based on the collected information. This phase is called logical design. The next design phase is the physical design phase. Its task is to specify the technologies and infrastructure for the project.

The conceptual design will be covered under the topic Online Teaching/Learning Needs Analysis. We will identify the requirements for teaching and hands-on practice. The requirements for an online teaching/learning system depend on the requirements for teaching. This chapter provides you with a systematic way of identifying teaching requirements. The logical design and physical design will be covered by the topic Online Teaching/Learning System Design. In this topic, a conceptual design will be converted to a logical model. Then, the components of the logical model will be specified with technical terms. These technical specifications will allow us to select open source tools in later chapters.

After a system is properly designed, the next stage is system development. At the development stage, the system is physically constructed. Based on the technology analysis, we can figure out what type of online teaching/learning system should be developed. However, system development will be affected by several other factors, such as teaching requirements, cost, ease of learning, and support from the institution. In addition to issues related to system construction, we will discuss the issues related to identifying resources, assessing cost, scheduling the project’s timeline, and forming the project’s development team. Investigating these topics will help you decide how the online teaching/learning system should be built and what to do to support the online teaching/learning system in the future. The online teaching/learning system to be developed should balance the support, cost, and the complexity of technologies. The development stage will be discussed under the topic Online Teaching/Learning System Development.

After the online teaching/learning system is developed, the next stage is the implementation stage. During the implementation stage, the tasks to be accomplished are online teaching/learning system deployment and management. The goal
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