Chapter XXI

# How to Teach Using Today's Technology:
## Matching the Teaching Strategy to the E–Learning Approach

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## ABSTRACT

*This chapter reviews the benefits and challenges of five approaches for integrating technology and teaching. Three of the models involve distance learning, while the two others utilize technology as a teaching aid. The first model is a lecture-based course also available through a Web site. The second is a fully online asynchronous course. The third is synchronous distance learning. The fourth combines a virtual laboratory and visualization with regular teaching, and the fifth fuses technology with different teaching methods. The pedagogical and operational aspects of the five approaches are discussed. The main pedagogical aspects discussed are: applying active and interactive learning principles, using multimedia, organizing the course and its lessons, and providing immediate feedback to students about their progress. By comparing the advantages and challenges the different models offer, teachers in K-12 will be able to match the appropriate model and its teaching strategy to their learning goals.*

## INTRODUCTION

### The Scope and Aims of this Chapter

Over the past few years, as a consequence of the rapid development of technology, we are seeing the crystallization of the five most commonly used models for the integration of technology in teaching. The major aim of this chapter is to present these five models and discuss their pedagogical aspects, benefits, and disadvantages. By comparing the advantages and challenges the different models offer, teachers

in K-12 will be able to match the appropriate model and its teaching strategy to their learning goals.

Three of the models involve distance learning, while the two others utilize technology as a teaching aid.

The first fundamental condition for the successful implementation of each of the five models is that the teacher and students be technologically literate. They must all possess a basic level of technological literacy in order to be able to take advantage of the benefits offered for making teaching more efficient.

We live in an era in which advanced teaching strategies depend upon technology. Teachers and students who understand and are comfortable with the concepts and workings of modern technology are better able to participate fully in technology-based learning environments. For these reasons a growing number of voices are calling for the mandatory study of technology by K-12 students worldwide. Technological literacy is the ability to use, manage, assess, and understand technology. It involves knowledge, abilities, and the application of both knowledge and abilities to real-world situations (ITEA, 2003).

Alongside presentation of the five models' pedagogical benefits and shortcomings, this chapter also discusses, for each model, ways in which teachers' and students' technological literacy can be developed so that they will be able to use these models effectively.

## Five Commonly Used Models for Integrating Technology in Teaching at the K-12 Level

The first three models involve distance learning. The first model is a lecture-based course also available through a Web site. In other words, lectures are given in the traditional manner, but in parallel a Web site is built on behalf of the course for exercises and practice drills, enrichment, and in-depth study of the subject. The second model—a fully online asynchronous course—requires only a very limited number of classroom sessions. The primary teaching is conducted through the course Web site. This contrasts with the third model—synchronous distance learning. In this model, teaching resembles, in some of its features, traditional teaching, yet the teacher and his or her students are physically distant from one another.

The first model uses computer technology as a teaching aid and combines a virtual laboratory and/or visualization with regular teaching. This model is most prevalent in science teaching. The second technology as a teaching aid model fuses technology with different teaching methods, such as using the Internet as a source of information in teaching/learning, founded on inquiry-based learning, project-based learning, or the WebQuest approach.

## What are Distance Learning, Asynchronous Distance Learning, and Synchronous Distance Learning?

According to Mielke (1999), distance education is a method of education in which the learner is physically distanced from both the teacher and the institution providing the instruction. Learning may be undertaken either individually or in groups. In its original form, teachers teaching distance education corresponded with students via regular mail, telephone, or fax. The students usually submitted the assignments through the mail. Using various forms of electronic media—such as radio, television, and videoconference—and advanced communication technologies increases time effectiveness, enables flexibility of location, and improves delivery of information.

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