Chapter II

WebLan-Designer: A Web-Based Tool to Enhance Teaching and Learning Wired and Wireless LAN Design

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Abstract

It is somewhat difficult to motivate students to learn both wired and wireless local area network design because students find the subject technical, dry when delivered in class, and rather boring. This chapter introduces the case of a Web-based tool for class demonstration as well as modelling LAN design. The background of the case is presented and is followed by a review of some existing tools for network simulation and modelling. After introducing the learning theories and concepts (e.g., experiential learning and constructivism) relevant to the tools’ pedagogical value, the chapter describes the architecture and components of WebLan-Designer. The main benefits of using WebLan-Designer are discussed in the light of educational theories, and their validation is supported by a summary of comments received. The chapter concludes with remarks on the strengths and weaknesses of WebLan-Designer and its future development.
Learning Objectives

After completing this chapter, you will be able to:

- Discuss the usefulness of WebLan-Designer in teaching and learning contexts.
- Use WebLan-Designer in both face-to-face and distance learning environments for teaching and learning LAN design.
- Verify the solutions to LAN design exercises using WebLan-Designer.
- Suggest further enhancements to WebLan-Designer.

Introduction

It is somewhat difficult to motivate students to learn both wired and wireless local area network design because students find the subject technical, dry when delivered in class, and rather boring. Educators have experimented with different approaches to alleviate this problem. Examples include computer-assisted learning packages (Diab & Tabbara, 1995), game-based simulation (Shifroni & Ginat, 1997), approaches based on the constructivist paradigm (Chen, 2003), experiential learning (R. K. C. Chang, 2004), and learning research techniques such as the phenomenographical approach (Berglund, 2003).

This chapter introduces the case of a Web-based tool for class demonstration as well as modelling LAN design. The motivational background of the case is presented in the next section and is followed by a review of some existing tools for network simulation and modelling. After introducing the learning theories and concepts (e.g., experiential learning and constructivism) relevant to the tools’ pedagogical value, the chapter describes the architecture and components of WebLan-Designer. The main benefits of using WebLan-Designer are discussed in the light of educational theories, and their validation is supported by a summary of comments received. The chapter concludes with remarks on the strengths and weaknesses of WebLan-Designer and its future development.

Background and Motivation

LANs are often included as a topic in computer science, information technology, engineering, and business courses as LANs are a fundamental component of IT