Chapter VIII

Enhancing Teaching and Learning Wireless Communication Networks Using Wireless Projects

Trevor Craig, Wollongong College Auckland, New Zealand
Nurul I. Sarkar, Auckland University of Technology, New Zealand

Abstract

Due to the rapid developments in wireless communication and networking technologies and the high demand for wireless networking skills in the industry worldwide, wireless communication and networking courses are becoming increasingly popular in universities, polytechnics, and private training institutions around the globe. Unfortunately, wireless communication and networking is a challenging subject to teach in a meaningful way because many students appear to find the subject technical, dry, and rather boring. To overcome this problem, the authors introduce a set of new projects in order to provide the students of wireless communication and networking with a hands-on learning experience. The projects are suitable for classroom use in introductory wireless networking courses.
Learning Objectives

After completing this chapter, you will be able to:

- Discuss the usefulness of the wireless projects in teaching and learning contexts.
- Explain how wireless projects can be set up for class demonstrations.
- Define the following key terms: ad hoc network, access point, infrastructure network, modulation, and wireless link.

Introduction

Wireless communication and networking is a challenging subject to teach in a meaningful way because many students appear to find the subject rather dry and technical and so quite boring. To overcome this problem, the authors have prepared a set of projects in order to provide the students of wireless communication and networking with a hands-on learning experience. These projects are designed around low-cost wireless modules and PC cards that are available from local electronics shops. The projects are suitable for classroom use in introductory-level wireless networking courses. The effectiveness of these projects has been evaluated by both students and a teaching team. The implementation of the wireless projects was successful not only because of the positive student feedback but also in that students scored better in the final exam. This chapter describes these projects completed to date, their overall effectiveness, and our plans for further projects. It also discusses the impact of wireless projects on student learning and comprehension.

Background and Motivation

Wireless communication and networking courses are becoming increasingly popular in universities, polytechnics, postsecondary colleges, and private training institutions around the globe. This is partly because of rapid developments in wireless communication and networking technology and the high demand for wireless communication networks skills in the industry worldwide. Unfortunately, it is difficult to motivate students to learn wireless communication and