Chapter XVIII

Wireless in the Classroom and Beyond

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ABSTRACT

The deployment of wireless data networks at American institutions of Higher Education has increased dramatically since the establishment of the 802.11 standards by the IEEE. These networks are generally deployed as extensions of the campus network to provide additional functionality to an increasingly mobile student population. As these networks become ubiquitous, they will increasingly be used for both classroom management and business m-commerce applications. Institutions with or considering wireless networks are advised to establish policies for the cooperative management of bandwidth, spectrum and security. Over time, the deployment of ubiquitous, standards-based networks will enable the deployment of an entirely new set of applications that will be useful throughout the university.

INTRODUCTION

With the advent of open wireless networking standards, a new age of untethered computing has dawned across the broad vista of American Higher Education. Much of the focus has been on providing access to mobile computers in the classroom. Our experience at Wake Forest has been that there is a significant

role for wireless and mobile computing not just in support of the classroom but throughout the Academic Enterprise.

Just as wired networks quickly spread around the campus and throughout our lives, so too will standards-based wireless local area networks. The transition is already beginning. It is happening on campuses throughout North America already. As these networks are deployed to support initiatives in teaching and learning, they will also increasingly support non-teaching activities. Beyond facilitating e-learning, the new wireless technologies when combined with developing classes of super-mobile and handheld computers will enable an entirely new class of mobile commerce and mobile workforce activities. Far from being a solution that only has applicability in the classroom, wireless and mobile technologies will have broad impact throughout the educational enterprise.

BACKGROUND

During the late 1980s and throughout the 1990s, there was a significant investment in campus networking in American Higher Education. Even as late as 1998, surveys indicated that networking and access to the Internet were top technology projects for both public and private higher educational institutions in the United States (Green, 1999). Many of these networks started out as departmental local area networks (LANs) that supported file sharing, print sharing and local e-mail. With the rapid expansion and commercialization of the Internet and its supporting standard (TCP/IP), stand-alone LANs were quickly assembled into campus-wide networks. The result, in many cases, was combined networks of different technologies, standards and support cultures. For many colleges and universities, control over campus LANs still remains a thorny issue. Providing networking on the college campus, in fact, became so omnipresent that it gained notice in the popular press. One popular technology magazine even devotes an entire issue each year to listing America's "Most Wired Colleges and Universities."

It seems rather counter-intuitive that there would be such interest in wireless networking after a period of intense investment in wired networking. Yet, during 2000 and 2001 wireless networking was a very popular topic on university campuses. Schools as diverse as Wake Forest University, Carnegie Mellon, the University of Oklahoma, the University of Kentucky, the University of North Carolina, the University of Oregon, Seton Hall University, Sacred Heart University and Buena Vista College have made significant investments in providing wireless access on their campuses while at the same time providing wired access as well (Oh, 2000; Young, 1999). Part of the reason that wireless networks have become so popular so quickly is that they seemingly fit quite well with the mobile lifestyle of

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