Secure E-Learning and Cryptography

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EXECUTIVE SUMMARY

This chapter investigates the problem of secure e-learning and the use cryptography algorithms as tools to ensure integrity, confidentiality, non-reputations, authentication, and access control to provide secure knowledge delivery, secure student feedback, and secure assessments. Providing privacy in e-learning focuses on the protection of personal information of a learner in an e-learning system, while secure e-learning focuses on complete, secure environments to provide integrity, confidentiality, authentication, authorization, and proof of origin. The secure e-learning system and the use of cryptography is the main theme of this chapter. In addition, the authors present a new cryptograph e-learning model based on PKI and cryptography access control. The model is based on creating secure shell system based on PKI, and each adding block has to certified itself to be assessable.

INTRODUCTION

This chapter will investigate the problem of creating a secure E-learning environment for distributed mobile E-learning systems, or so-called mobile learning (M-learning). These types of E-learning systems provide service mobility where the learner can access the learning content from anywhere using any suitable device, such as a desktop computer at home or work, laptops, or PDAs with a wireless connection. Privacy in E-learning will focus on the protection of personal information of a learner in an E-learning system, while secure E-learning will focus on complete, secure environments to provide integrity, confidentiality, and availability.

E-learning, also known as Distance Learning (DL), refers to learning where teachers and students do not meet face-to-face. E-learning is a special form of e-business. It provides a new set of tools that add value to traditional learning modes. E-learning does not replace the classroom setting experience, but enhances it; taking advantage of incorporated interactivities and multimedia capabilities afforded by new technologies. In an approach to increase user acceptance of E-learning systems, security and privacy are two crucial factors that must be implemented to achieve an increase in user acceptance and the success of E-learning systems. Security is seen as an enabling technology to E-learning, because people often avoid using systems they do not trust to uphold their privacy and usage.

The history of distance education could be tracked back to the early 1700s in the form of correspondence (mail) education, but technology-based distance education might be best linked to the introduction of audiovisual (relating to sound and vision) devices into schools in the early 1900s (Jeffries, 2009).

The first catalog of instruction films appeared in 1910 and, in 1913, Thomas Edison proclaimed that, due to the invention of film, "Our school system will be completely changed in the next ten years" (Saettler, 1968).

This dramatic change did not occur, but instructional media were introduced into many extension programs by 1920 in the form of slides and active pictures just as in the classroom. The introduction of television as an instructional vehicle appears as an important access point for practitioners and theorists outside of correspondence education, and marks support and sometime parallel way for correspondence study, teaching, and training media.

Instructional television was viewed with new hope after instructional radio was unsuccessful in the 1930s. In 1932, seven years before television was introduced at the New York World's Fair, the State University of Iowa began experimenting with transmitting instructional courses.

World War II slowed the introduction of television, but military training efforts had demonstrated the potential for using audio-visual media in teaching. The apparent success of audio-visual generated a renewed interest in using it in the schools, and in the decade following the war, there were intensive research programs. Most of these studies were directed at understanding and generating theory on how instructional media affected classroom learning (Jeffries, 2009).

M-learning is a relatively new development in the E-learning world and it is increasing rapidly because:

- Higher education projects rely on partnerships with many sectors.
- Handheld devices are used to increase interaction in large enrollment classes.
- M-learning may potentially increase the digital divide.