

Chapter XXI

Information Security Within an E-Learning Environment

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ABSTRACT

This chapter introduces information security within the educational environments that utilize electronic resources. The education environment experienced a paradigm shift over the last several years, due to the rapid growth in technology. This growth has made it possible for the education environment to utilize electronic services to enhance education methods. It is however vital that all education environments (traditional or new ones) ensure that all resources (lecturers, students and data) are properly protected against any possible security threats. This chapter highlights the importance of securing information within the electronic environment. This is done by providing key aspects that must be addressed and implemented to ensure information security. The chapter also identifies four information security pillars that could assist top management to enhance overall information security management.

INTRODUCTION

Over the last few years the education environment has undergone a paradigm shift as a result of rapid growth of the technology such as the Internet. This growth in technology has made it possible for educational institutions to utilize electronic services to enhance their education methods by

incorporating electronic learning (e-learning). E-learning can be defined as a technology-based learning environment where teaching material is supplied to the learner by means of technology, for example a computer network. E-learning has advantages and disadvantages for learners, educators as well as the educational institution. It is, however, critical that possible disadvantages

(such as the loss of sensitive information) are addressed proactively before they can cancel out the advantages of an e-learning environment.

It is vital that all education institutions that have existing e-learning environments (or wish to have one) should understand that e-learning education is fundamentally dependent on the use of information and communication technologies (ICT). However, the use of ICT in the e-learning environment opens the door to many information security risks. These information security risks (such as unauthorized changes to learning material) could compromise the entire education environment if they are not properly and timely addressed. It is therefore imperative that all e-learning institutions ensure that they are aware of all the possible information security risks involved in e-learning, as well as which information security measures should be implemented to prevent possible information security incidents. A great deal of research has been done regarding e-learning, but not much attention has been paid to the important role that information security plays within the e-learning environment.

This chapter starts by addressing information security by mentioning a few information security issues that should be considered and implemented within an e-learning environment. The chapter then continues by primarily focusing on different information security issues that should be integrated, implemented and monitored in an e-learning environment to ensure that the integrity of information is not compromised in any way. This chapter concludes by identifying the different role-players (such as learners and educators) as well as their roles and responsibilities in securing the information with which they work. This means involving all role-players in the overall information security plan.

The next section will address some information security issues such as awareness, monitoring, policies and governance that is important to implement within any e-learning environment.

INFORMATION SECURITY: POLICIES AND PROCEDURES

We live in an era in which information is becoming increasingly valuable and the organization with the best information on which to base management decisions will be the likeliest to win and prosper (Finne, 2000). It is therefore essential to secure information properly against all possible information security threats (from inside as well as outside the organization). This section identifies some information security issues that should be taken into consideration when securing information in any environment.

Information is the Lifeline of Many Organizations and Must be Protected

Without information, many organizations will cease to exist. It is therefore vital to protect information from all possible information security threats. Let's look at a few examples where information has been compromised.

The first example is the Sasser Worm which was first detected on 30 April 2004. It spread rapidly and infected more than a million Windows machines worldwide, using a security hole in the Windows operating system (Roberts, 2004). Microsoft offered a reward of \$250 000 for the apprehension of the culprit. Train traffic was halted in Australia (Rail Infrastructure Corporation - RailCorp), leaving 300 000 travellers stranded, while two country hospitals in Sweden were infected and left with 5 000 computers and X-ray equipment off-line (F-Secure, 2004). Sasser affected the availability of information, which led to the compromising of services such as those provided by RailCorp.

The second example is that according to the Donau University Krems, an Italian couple hacked into the security system of two American banks and stole credit card data pertaining to nearly

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