Chapter 8
Developing Cyber Security Competences Through Simulation-Based Learning

Bistra Konstantinova Vassileva
https://orcid.org/0000-0002-5976-6807
University of Economics, Varna, Bulgaria

ABSTRACT

The importance of cyber security competences is growing both in practice and in academia during the last few years. This chapter provides a current overview of the existing body of the literature in the field of simulation-based learning and the key cyber security issues. The author's primary goal is to develop a methodological business-oriented and evidence-based learning framework which will provide students or trainees with the opportunity to develop practical skills in the field of cyber security issues through a virtual business simulator. The overall intention is to provide a coherent framework that makes use of active-based learning and gamification to support the active participation of students or trainees. To meet these goals, the Reference Framework for Applied Competences (REFRAC) is applied. Taking into account that in 2040 ICT and internet will be 'culturally invisible', cyber security competences will be a must for everyone. They will be critical both for personal and companies' survival in the turbulent and highly competitive digital environment.

DOI: 10.4018/978-1-7998-4285-9.ch008

INTRODUCTION

The importance of cyber security competences is growing both in practice and in academia during the last few years. This chapter provides a current overview of the existing body of the literature in the field of simulation-based learning and the key cyber security issues. The author's primary goal is to develop a methodological business-oriented and evidence-based learning framework which will provide students or trainees the opportunity to develop practical skills in the field of cyber security issues through a virtual business simulator. The overall intention is to provide a coherent framework that makes use of active-based learning and gamification to support active participation of students or trainees in the learning process. To meet these goals, the Reference Framework for Applied Competences (REFRAC) is applied. Taking into account that in 2040 ICT and internet will be 'culturally invisible' (Manyika et al., 2015) cyber security competences will be a must for everyone. They will be critical both for personal and companies' survival in the turbulent and highly competitive digital environment. Research questions driving this chapter are as follows: 1/ to identify the key topics of cyber security which should be taken as mandatory topics during the training sessions; 2/ to evaluate the possibilities of simulation-based learning to be applied for cyber security issues, and 3/ to propose a methodological framework of simulation-based learning environment aimed at cyber security skills development.

BACKGROUND

This chapter begins with outline of the importance of cyber security issues, cyber security education and experience-based learning approach. The author's primary goal is to develop a methodological business-oriented and evidence-based learning environment which will provide students the opportunity to experience different professional skills, incl. cyber security competences. The overall intention is to offer a coherent framework that is student-oriented and makes use of active-based learning to encourage student active participation. A survey among students was conducted to support the identification of critical cyber security competences to be used in the background layer of the Reference Framework for Applied Competences (REFRAC).

Worldwide spending on on information security products and services is estimated to reach over $124 billion in 2019 (RSAC, 2019). Cyber security budgets have been on the rise for the past several years, increasing by 141% from 2010 to 2018. These numbers show the raising concern to the new challenges to legitimate businesses caused by the increasing activities of the cyber criminals. Cyber security is becoming a key business enabler and a vital tool to protect competitive advantage of companies