CHALLENGES AND OPPORTUNITIES OF REMOTE TEACHING IN CYBERSECURITY

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Abstract

Remote teaching has replaced face to face teaching in the last few months in most, if not all, higher academic education institutions. It is a form of teaching where face to face sessions and assessments must be delivered using online technologies and is different to online learning where material has been developed to be delivered online. This enquiry shows the challenges and opportunities arising from remote teaching in the field of Cybersecurity and recommendations for the future are proposed. The results indicate that there are indeed some challenges but there are also lessons learned and opportunities for the future.

Introduction and context

The Coronavirus disease (Covid-19) outbreak brought in the forefront of education what is known as remote teaching. However, this form of teaching should not be confused with online learning. Remote teaching is a type of teaching were face interactions are replaced with online alternatives.

In remote teaching scenarios module leaders provide details regarding how the particular module they lead will run. For example, lectures and tutorials can be replaced by online alternatives such as live or prerecorded sessions [3]. Furthermore, another issue that needs to be considered is the module assessments. Whereas, online learning is specifically developed with delivery of sessions and assessments in mine for distance learning students, remote teaching is used in scenarios where the delivery of teaching sessions and assessments is a necessity [1]. Thus, assessments might have to be changed . When remote teaching is in place there are different technologies that can be used to support staff and students. These can include:

1. Studentcentral (A virtual learning environments that is used for face to face as well, where all teaching material, assessments and communication is delivered).
2. Microsoft Teams (A tool that can be used for online discussions and for the delivery of lectures and tutorials).
3. Pre-recorded lectures (Used in face to face teaching as well).
4. Electronic submission of assessments (Used in face to face teaching as well but not for exams).

This enquiry aims to inform about the challenges and implications of remote teaching with relation to Cybersecurity.

Research questions

This enquiry answers the following research questions:

1. Can we overcome the challenges related to remote teaching?

2. Are there any opportunities to learn skills and improve knowledge for the future?

Challenges, opportunities and recommendations

Having a general understanding of what remote teaching and the difference from distance learning courses is a good first step. However, different courses have different requirements and this enquiry has been based on the postgraduate SEC03 System and Network Security module. In this module each week there is a one hour lecture followed by a two hour lab exercise and the assessment is 30 percent practical coursework and 70 percent exam.

Remote teaching has some challenges that need to be addressed but there are also opportunities created by it. Some of the challenges include the use of new technologies, working from home, dealing with students that have special needs and designing alternative assessments. On the other hand there are also skills developed such as learning new technologies and practices, gain subject knowledge and gaining experience that can be used in similar situations and when supporting other people or students at distance.

Having been peer observed in this module and by observing a colleague delivering a session for a similar module using Microsoft Teams we came to the conclusion that (a) working from home and (b) designing alternative assessments are the two most challenging aspects of remote teaching. Working from home because you can get easily distracted and because family members, especially children, might interrupt you. Designing alternative assessments was also important because all lab exercises need a personal computer and specialized software, which although is free to download, it's challenging to use. Therefore, some of the exercises had to changed to alternatives. Furthermore, the final exam component had to be replaced with a coursework. Although there were different options such as an online exam, it was judged that the coursework option was more appropriate based on the learning outcomes and the ease of an online exam. On the other hand opportunities include learning skills that can be used when face to face sessions are back in place such as the use of new technologies. For example, Microsoft Teams can be used to deliver a lecture when a lecturer is away from the University for any reason. Another important opportunity is that students that are not able to attend a session can participate online or through a recorded lecture [1, 4]. Skills and knowledge developed during this remote teaching period include how to support students that are away for a certain period of time and have acquired specialized knowledge when this comes to cybersecurity. Learning is constant for academics and knowledge was gained on the use of new learning technologies such as specific software and alternative assessments can be used in normal times as well.

In [2] there are frameworks for supporting active online learning which are called E-tivities. These are actually activities that can be used by individuals or groups who participate in online learning. Remote teaching is different to online learning, however these activities are still applicable and are recommendations for future use. E-tivities have elements such as a title, a purpose, summary of the task, spark, individual contributions, dialogues, a moderator, schedule and what is the link to the next E-tivitiy. The purpose of the activities are to move away from content based online teaching to a more learner-based approach where learners are working together and exchanging ideas, while the delivery of sessions becomes less boring compared to an academic doing all the talking. Remote teaching has offered us an opportunity where academics can gain significant knowledge about technologies and gain knowledge and develop attributes in the area of supporting students remotely, something that can increase student satisfaction and learning.

To give clear answers to the research questions we can see that indeed there are challenges that can be handled efficiently, such as working from home and designing alternative assessments. And on the other hand there are clear opportunities that can improve the skills and knowledge of both academics and students and these include learning and pedagogic practices and reducing face to face support of students.

Results

Remote teaching has its advantages and disadvantages. In the SEC03 module there were some challenges that had to be dealt with. As the results in figure 1 indicate, changes had to be made in assessments. The orange colour represents the total percent value of a particular type of assessment and blue represents the value that had to be changed.

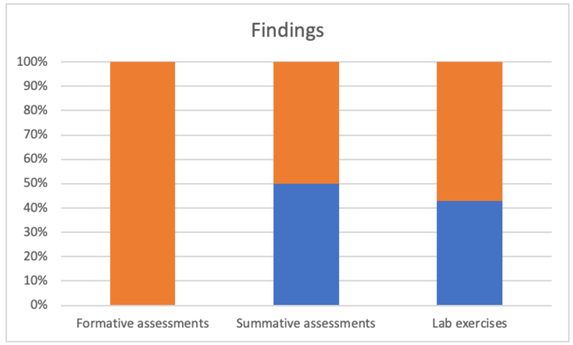

Fig. 1: Findings

Other finding deriving from peer observation include that when working from home it's difficult to be convenient as you are in your office, resources might be limited and frequent interruption is an issue. More specifically, for Cybersecurity an implication is the complexity of the software used by the students and alternative assessments need to be considered. On the other hand, positive findings include the fact that new skills and knowledge are acquired and can used in face to face teaching to support students in various ways.

Conclusions

This enquiry investigated the challenges and opportunities of remote teaching in higher education with relation to Cybersecurity. It is challenging when working from home in general and the complexity of Cybersecurity makes it necessary to consider alternative assessments. On the positive aspects included new skills and knowledge acquired and in the future newer colleagues can be supported by this knowledge as well. Face to face teaching can be supported by this knowledge too for students that are not able to attend some of the sessions or meetings with academics in person.

References

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