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USER ACCEPTANCE OF CYBER SECURITY APPLICATION (*OUR CYBERHERO*) AMONG SECONDARY SCHOOL STUDENTS, TEACHERS AND LOCAL COMMUNITIES IN COASTAL TERENGGANU DISTRICT: A PRELIMINARY STUDY FOR MARITIME EDUCATION

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ABSTRACT

This paper is based on knowledge transfer program to improve cyber security awareness among the coastal community in Kuala Terengganu with the use of *Our CyberHero* application. Thus, this paper introduces the application and adapt Technology Acceptance Model in maritime education settings. A series of these knowledge transfer programs can to some extent address this knowledge gap. This research has conducted a survey to the 59 coastal communities in Terengganu District. This program is a pilot project to the cyber security application *Our CyberHero* and is divided into two phases. The first phase was held a webinar on the importance of cyber security sustainability in today's society. While the second phase gives exposure to the use of cyber security applications. This involves collaboration from the Educational Resources and Technology Sector, the Terengganu State Education Department, the Communications and Multimedia Commission and Cybersecurity Malaysia. The stakeholders involved were 24 high school students, 12 teachers and 23 communities from the coastal state of Terengganu. All 36 stakeholders are made up of 12 secondary schools that were selected as pioneers for the knowledge transfer program. Thus, the 23 other communities are besides the school children and the teachers. Acceptance of the use of cyber security application is very encouraging among students and teachers of coastal

secondary schools in the Terengganu district. The 85% of the users feel easy to use the application as the module is easy to understand and friendly user. Therefore, the users feel confidence to use and share information widely (65%). With the high confidence level and understanding of the application, the users tend to trust the application system and the other users (59%). As a result, 57% users are intended to use *Our CyberHero* application and 52% of the users also feel the application is useful.

Keywords: User acceptance, cyber security, *Our CyberHero* application, maritime education and coastal community

Introduction

Cyber security refers to preventive methods used to protect information from being stolen, compromised or attacked. It requires an understanding of potential information threats, such as viruses and other malicious code. Cyber security strategies include identity management, risk management and incident management. "Cyber security threats can quickly overtake traditional approaches to data security as the economy shifts to a digital and online model," said CEO of MyDIGITAL Corporation (MyDIGITAL Corp), Fabian Bigar (Awani, 2022).

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Malaysians' level of cyber security awareness is still low. There are many people in the country who do not practice the ethical and responsible use of technology. Cyber Security Malaysia received 4,615 cyber security incident reports from January to May 2021 through the Cyber999 Help Center. Of the total number of reports, the top three are fraud, with 3,229 cases, intrusion (765) and malicious code (256). Other incidents include spam, attempted intrusions, denial of service, cyber harassment, vulnerability reports and related content. Although the level of cyber security threats in this country is still not worrying, the community needs to equip itself with knowledge about cyber security and the latest technology and always be alert to the latest forms of cyber threats (KKMM, 2021).

Following the existence and emergence of the danger, the government and the Malaysian Armed Forces have enhanced their cyber security capacity in predicting, detecting, preventing and acting against this threat. The Malaysian government allocated RM1.8 billion to transform the National Cyber Security Agency (NACSA) to deal with the threat, in line with the aspirations of the Malaysian Cyber Security Strategy 2020-2024. NACSA's assessment in the Malaysian Cyber Security Strategy 2020-2024 foresees an increase in cyber threats (Bernama, 2021).

Therefore, the purpose of this program is to improve cyber security awareness in the maritime community in Kuala Terengganu with the use of *Our CyberHero* application. It is hoped that this knowledge transfer program can address this knowledge gap to some extent.

Cyber security works the same way as offline security in that it aims to keep users and their computers safe. In the real world, users might be satisfied with a video doorbell and locks on all the windows, but online, things aren't that simple. Online fraudsters can gain access to users' information in a number of ways. They may even convince users to voluntarily send them information, just because users don't realize they are being scammed. The internet can be a scary and dangerous place to be alone, which is why users need to make sure they have some solid security measures.

Several studies show that advanced action is among the important elements in strengthening cyber security. The rapid growth of cyberspace in the last two decades has given rise to the new phrase of cyber security, which is a sequel to information security or IT security (Van den Berg, 2018). Based on a study by Bjurling-Sjöberg *et al.* (2021), at baseline and follow-up, views on the recommendations were favorable and did not change significantly. Additionally, based on a study from Hagger *et al.* (2020), in both populations, structural equation models revealed that habits at follow-up were consistent predictors of social distancing behavior.

Literature Review

Maritime Education

In this study, maritime education is focused on a knowledge transfer program for a coastal community in Terengganu. The coastal community in this study carry out economic activities involving the ocean and inland areas. Coastal communities are often categorized as poor and there are gaps between them and urban groups, especially in ICT services. They still use interpersonal communication, such as by face to face, with family members or neighbors. Some communities do not engage much in virtual activities, because they believe they can still communicate well each other without using internet tools (Djaffar, 2017). The use of information and communication technology (ICT) makes the process easier, efficient and effective.

However, nowadays coastal communities comprise not only fishermen but also professionals, entrepreneurs and students of higher institutions. There are communities that accept ICT but not as a whole. For example, there are still school teachers in coastal areas who are not good at using internet tools and are more comfortable teaching face to face (Bernama, 2020). Because, not all coastal communities are exposed to internet knowledge, they have difficulty in getting the latest information.

Coastal communities have certain characteristics that allow them to survive without using technological tools (Fajrie, 2020). However, ICT offers speedy information access that overcome space and time limits. Life in the digital era has proven that ICT provides social space in flexible way. There is no denying that ICT also changed human lifestyles because everyone is free to express their feelings, ideas, also find sources of living (Haris, 2007; Tabassum *et al.*, 2017).

Coastal communities are also known as groups plagued by poverty and receiving less ICT services compared to urban communities, (Ramli *et al.*, 2019).

This study aims to create awareness among a coastal community of the importance of cyber security in the use of ICT. Through this study, awareness can be developed from this knowledge transfer program through the use of *Our CyberHero* application.

In line with the United Nations' Sustainable Development Goals, coastal communities need sustainable infrastructure facilities so that they have access to services. Second, coastal communities, especially in remote areas, often experience internet problems, burdening users, especially students and employees who need internet resources. Therefore, from this study the coastal community can identify the importance and awareness of cyber security.

Researchers believe that this study can help coastal community realize that e-communities can promote their business, find jobs and look for any information on the internet. The ability of the coastal community to use ICT well will produce strengthen relationships and improve trust with each other. Eventually, a close-knit community can reduce the problem of crime.

However, the coastal community does not consider social networks to be safe. According to Sara, (2021) security breaches occur if the user does not know or care whether a page is dangerous. Competitiveness is also affected when trust between groups is eroded.

Technology Acceptance Model/Theory

This study adapts the Technology Acceptance Model (TAM) to relate the idea of ICT and acceptance of cyber security application. TAM considers the attitudes of users toward

the use of ICT and cyber security awareness among the coastal communities. TAM in this context also relates to maritime education in terms of knowledge transfer program and application. The theory reflects the users' attitudes on *Our CyberHero* application. This application attracts user to use and understand basic cyber security awareness. With the understanding, the users gain more knowledge and awareness.

The technology acceptance model was proposed in the 1980s based on social psychology theory by studying the relationship between cognitive, emotional factors, and technology application.

The model is widely used in the fields of information technology and social sciences. The working principle is studying the influence of technology use on the belief, attitude, and intention of users based on external observation variables. TAM is composed of four basic elements: (1) user behavior that is the actual operation behavior of the users to the new technology; (2) behavioral intention refers to the willingness of users to try new technologies; (3) perceived usefulness is the subjective understanding of users for the utility of the newly adopted technology; and (4) perceived ease of use is the degree of effort that the technology users make use of new technologies (Tambun *et al.*, 2020).

The mathematical model of TAM is expressed in Equations (1)–(3).

$$B = W_1A + W_2U \quad (1) \quad B = W_1A + W_2U \quad (1)$$

$$A = W_3U + W_4E \quad (2)$$

$$U = W_5E \quad (3) \quad U = W_5E \quad (3)$$

In Equations (1)–(3), B, A, U, and E represent user behavior, behavioral intention, perceived usefulness, and perceived ease of use, respectively.

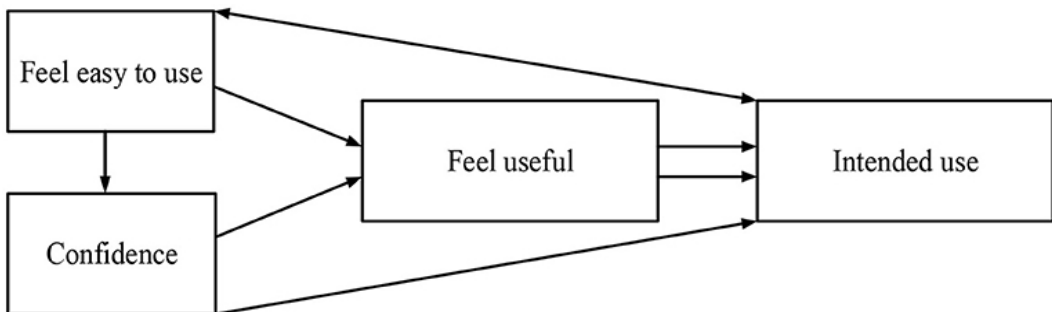


Figure 1: Technology acceptance model (TAM) theory

(Source: Tambun *et al.*, 2020)

Methodology

This study conducted an online survey on a coastal community in Terengganu. A total of 59 users had responded fairly to the questionnaire distributed to them. The Terengganu State Education Department took the responsibility to manage the distribution of the questionnaire based on districts in Terengganu. The respondents were 24 high school students, 12 teachers and 23 members of the community. The 36 users from 12 secondary schools were selected as pioneers for the knowledge transfer program.

Results and Discussion

Our Cyberhero Application Module

Technology and information facilities have greatly facilitated the affairs of human life, universally including education. However, the advancement of information technology is making the world borderless and also invites various risks and threats. Almost everyday we hear of fraud, extortion, and identity and information theft being reported that use technological openness

as a modus operandi. Such cases are becoming more and more acute because criminals are difficult to track down and many victims have lost thousands of ringgit, dignity and even their lives.

Interested parties such as the Department of Education and the Faculty of Maritime Studies, Universiti Malaysia Terengganu along with other strategic partners came forward to offer solutions to provide awareness to the public, especially students, about the importance of cyber security in this digital age. With the statistics of the *Our CyberHero* module powered by the Terengganu State Education Department and the collaboration of the Faculty of Maritime Studies, Universiti Malaysia Terengganu, it is hoped that cyber security education will be easier to access anywhere regardless of geographical background, age and level of education.

This module also provides information on cyber-crime and preventive measures to help victims report an incident by using the right channel. This can be explained as in Figure 2.

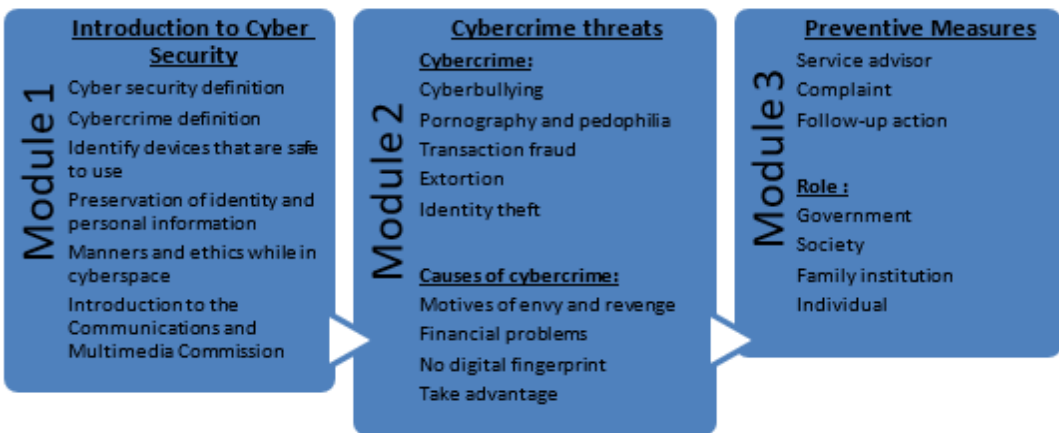


Figure 2: Three modules of *Our CyberHero* application: Authors

The Usage of Our Cyberhero Application

The majority of respondents are young people aged 14 to 20. There is also significant number of young adults aged 21 to 30. In addition, there are also school teachers aged 31 to 51. A number of senior citizens use the application as well.

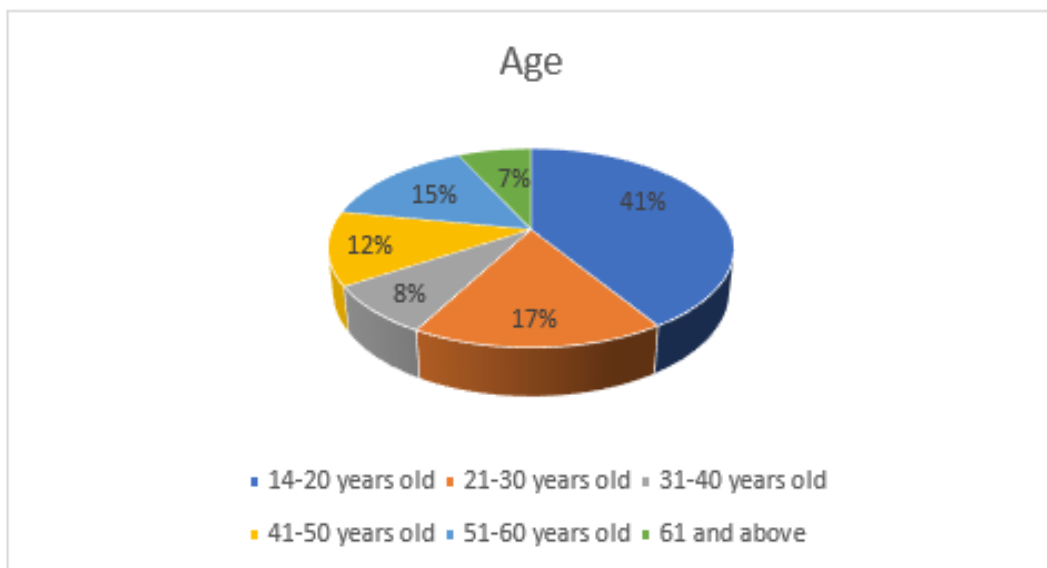


Figure 3: Age Group

(Source: Authors)

Based on gender, there is not much difference between male and female respondents. Both genders understand the importance of cyber security and also its application in daily life. This is also due to the fact that majority of the participants who attended the knowledge transfer program

were female. Gender does not really influence the users' level of awareness on cyber security, but it is the individual's attitudes that differentiate the intended use. Users will feel at ease when they are confident to use the application and have the confidence to share information.

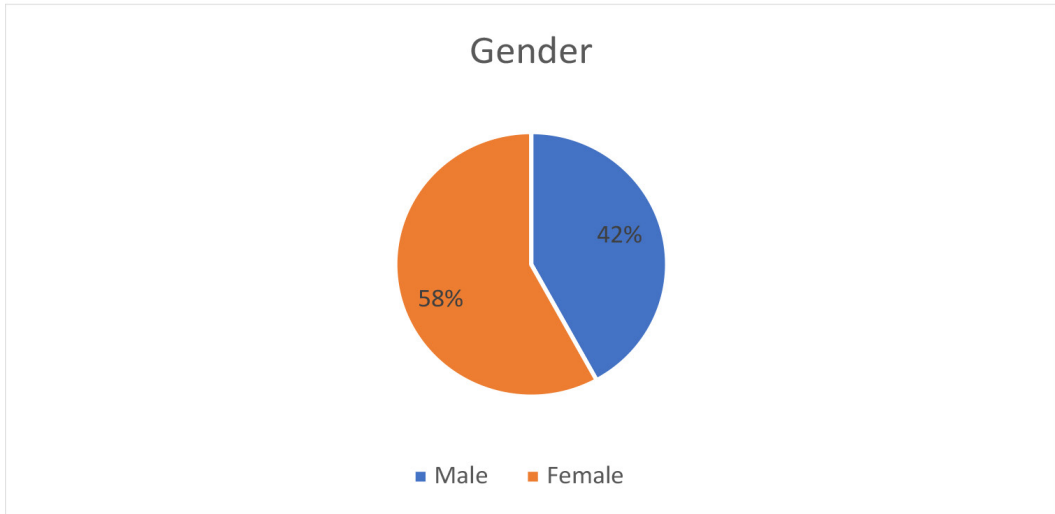


Figure 4: Gender

(Source: Authors)

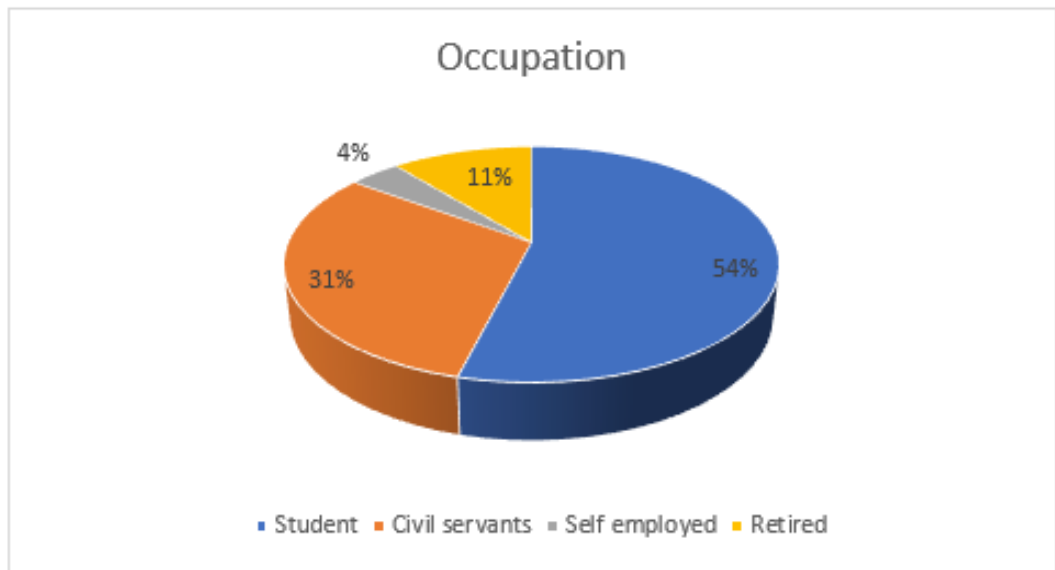


Figure 5: Occupation

(Source: Authors)

Most of the users are students, which consists of 54% of the total respondents. The next largest group is the civil servants at 31%, followed by retirees at 11% and self-employed 4%. The large number of school students might explain the acceptance of the Our CyberHero application. Users at school

particularly need to know more about cyber security as they make use of social media in every aspect of their lives. The use of social media brings more contact to the wider world, which could result in cyber threats and cyber-crime. These youngsters need to be protected from criminals and predators.

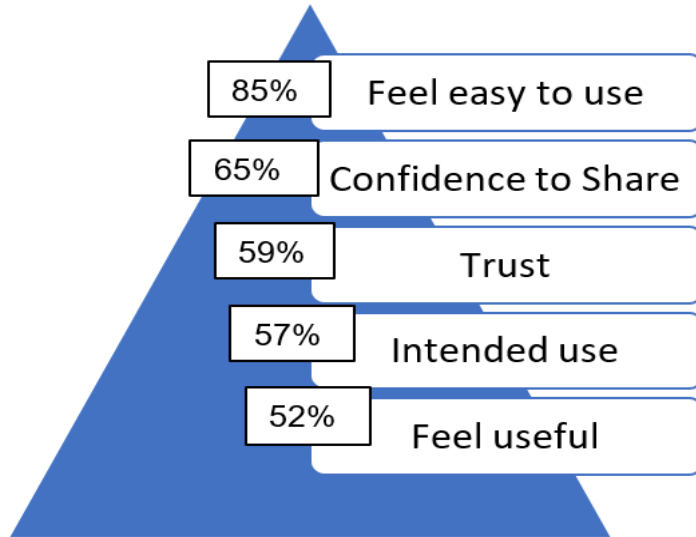


Figure 6: The Usage of Cyber Security Application

(Source: Authors)

As a result of stakeholder feedback, the majority can accept and understand the importance of cyber security in everyday life. The survey found that 57% understood the meaning of cyber security. 52% are always careful when sharing information online. 43% don't know how to keep data safe online. 9% have been cheated (scam) when dealing online. 65% always share authentic information online. 85% will not access another user's information if he does not complete the session perfectly. 59% believe that all personal information provided online will not be misused by any party.

Figure 6 illustrates that 85% of the users feel easy to use the application as the module is easy to understand and user friendly. Therefore, users feel confident to use and share information widely (65%). With the high confidence level and understanding of the application, users tend to trust the application system and the other users (59%). As a result, 57% users intend to use *Our CyberHero* application and 52% of the users also feel the application is useful.

Conclusion and Implication

In summary, this knowledge transfer program creates cyber security awareness to this coastal community in Terengganu. With the use of *Our CyberHero* application, users are aware of cyber security. This study introduces the concept of maritime education to well-equipped and well-prepared coastal communities in terms of cyber security education. In this regard, maritime education is being applied by the local community in the scope of cyber security application. With the execution of *Our CyberHero* application, TAM is suggested as applicable to this study. TAM applied to this context, consists four basic elements: (1) user behavior that is the ease at which users take to the *Our CyberHero* application; (2) behavioral intention (intended use) refers to the willingness of users to try *Our CyberHero*; (3) perceived usefulness (feel useful) is the subjective understanding of users for the usage of the *Our CyberHero* application; and (4) perceived ease of use is the degree of effort that the users make use of this application in this study context.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

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