DESIGN AND DEVELOPMENT OF PENYU KITA, AN INTERACTIVE ANDROID APPLICATION IN CONVEYING TURTLE ENDANGERED AWARENESS

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ABSTRACT

There are five modules within the app that are informasi (information), kesedaran (awareness), permainan (games), aktiviti (activity), and aduan (complaint). The Penyu Kita application was designed and developed by using the ADDIE model, MIT App Inventor 2 is used to program and Adobe Illustrator for designing the interfaces.

1.0 INTRODUCTION

According to Lovich et al. (2018), turtles have played important roles as significant bioturbators of soils, infaunal miners of sea floors, dispersers and germination enhancers of seeds, nutrient cyclers, and consumers. As said by Gleason et al. (2020), sea turtles are presently considered severely endangered species that are historically threatened by many environmental factors. As stated by Adeyemi et al. (2019), possible causes of sea turtle population reduction have been attributed to coastal erosion, destructive fishing (fishing with chemicals), pollution, real estate development around the coastal areas, consumption of turtle eggs and hunting turtle for meat, by catch by fishing trawlers, fishermen nets and other anthropogenic factors.

Turtle eggs were consumed in the past as a source of protein for coastal communities in Malaysia as they lacked access to alternative sources, but this was no longer necessary. According to Zainal (2020), in 1960s, the Malaysia population was just 10 million people and nesting numbers were much higher. In 2020, a population of 32 million but nesting numbers is decreasing and unstable. People need to stop the consumption of turtle eggs because the nesting numbers are fluctuating between 2,000 and 4,000 per year in Terengganu.

Turtle conservation groups wanted to continue raising awareness. The Turtle Conservation Society of Malaysia, (2011-2021) regularly conduct Turtle Awareness Programmes, or affectionately known as "Turtle Camps" with primary school students. These Turtle Camps are aimed increasing their knowledge and awareness on turtle conservation issues in the country. Lenzholzer et al. (2020) noticed that education and communication are perceived as the most effective means to raise people's awareness levels. As said by Alsharif et al. (2018), the findings tend to indicate the potential of smartphone apps as an effective educational tool.

Therefore, in order to support the Turtle Awareness Programmes, an Android application named Penyu Kita has been decided to be built. At the moment, this society still doesn't have any mobile application. This application was designed and developed by following through the ADDIE model phases, MIT App Inventor 2 is used to program and Adobe Illustrator for designing the interfaces.

2.0 METHODOLOGY

As stated by Branch (2009), ADDIE is an acronym *Analyze*, *Design*, *Develop*, *Implement*, and *Evaluate*. The ADDIE model was chosen due to the fact that it is appropriate for developing educational products. All the modules including the name of the application is in Malay Language as requested by the Turtle Conservation Society of Malaysia. The procedures of developing the Penyu Kita Android application are described as in Table 1 below:

Analyze	Design	Develop	Implement	Evaluate
1. Determine modules 2. Confirm the intended audience 3. Identify required resources 4. Determine potential delivery that is through the Play Store including cost estimate	5. Designing interfaces using Adobe Illustrator	6. Generate content 7. Select or develop supporting media like Android Package File (apk) files, versions and privacy documentation 8. Conduct a test in the Play Store	9. Prepare the student	10. Determine evaluation criteria 11. Select evaluation tool 12. Conduct evaluations

Table 1. Procedures organized by ADDIE

3.0 RESULTS AND DISCUSSION

The Penyu Kita app can be downloaded from the Play Store as can be seen in Figure 1. This app is declared as Education.

Figure 1. Penyu Kita on Play Store

The Penyu Kita Android application will first display a home interface with Turtle Conservation Society as title and a button named Penyu Kita as in Figure 2. Once the user presses the button, the user will be directed to the second interface as in Figure 3 where all the five modules were displayed. The five modules are informasi (information), kesedaran (awareness), permainan (games), aktiviti (activity), and aduan (complaint). The Penyu Kita button on top of the interface will direct user back to the home interface. On the bottom of the interface there is a disclaimer in red color font, stating that all pictures, information and activities are from the Turtle Conservation Society of Malaysia.
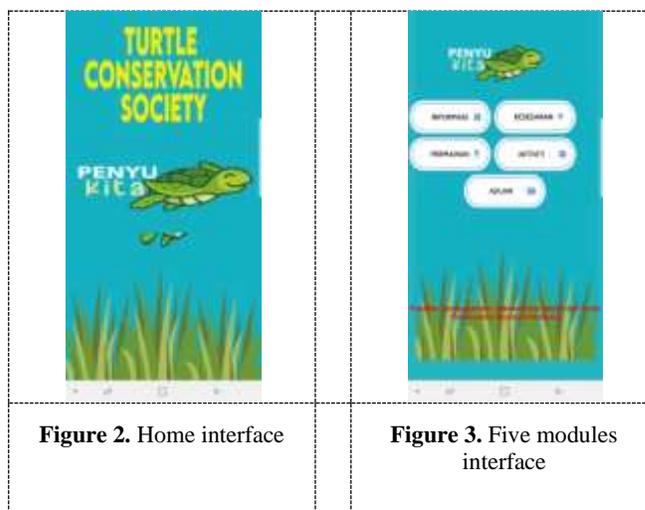
Figure 2. Home interface	**Figure 3.** Five modules interface

In the informasi (information) module, user will get to know about each type of turtle environment, physical and threats which an example interface of the sea turtle can be seen as in Figure 4. In this module, types of turtles with the scientific names are also displayed. An example interface of types of tortoise as in Figure 5.

Figure 4. Sea turtle environment, physical and threats

Figure 5. Types of tortoise

The second module is kesedaran (awareness). Figure 6 shows three buttons for the do's and don'ts interfaces. When the user presses the first button, the app will display actions to do if user encounters a sea turtle and if a sea turtle is nesting. Figure 7 shows the interface when the user presses the second button if the user encounters a turtle while driving. When the third button is pressed, the app will display on actions to do if the user encounter a turtle while trekking.

Figure 6. Three buttons for do's and don'ts

Figure 7. If user encounter a turtle while driving

The third module that is permainan (games) consists of two games that are true or false (Figure 8) and memory game (Figure 9). Once the user answered the true or false, marks will be displayed. When the marks gained by the user is not full, a try again message will be displayed. As for the memory game, user must remember each turtle picture that they clicked on and find the pair. When the user got all correct, a pop up dialogue box stating Tahniah!!! Anda menang will be displayed.

Figure 8. True or false game.

Figure 9. Memory game.

Figure 10 shows the interface of the fourth module that is the aktiviti (activity) module. There are four activities in the form of Portable Document Format (pdf) file in this module depending on the types of the turtle. Each activity contains information regarding turtle, fill in the blank, and find the hidden words.

Figure 11 shows the interface of the fifth module that is Aduan (Complaint). This module is a report towards the threatened turtle (s). When the user filled in the form, it will be sent directly to the wildlife crime email. Examples of crime that can be reported by the user are turtle-based traditional medicines, turtle meat, souvenir, traded as pet for instance star tortoise. User shall also need to provide the name of the shop, address, brief directions, landmarks, date and time of incident.
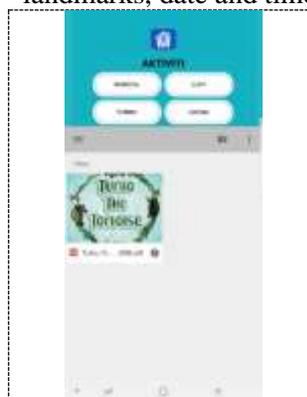
Figure 10. Aktiviti (Activity)

Figure 11. Turtle Threat Report

4.0 CONCLUSION

In order to support the Turtle Awareness Programmes of the Turtle Conservation Society of Malaysia, an Android application named Penyu Kita has been successfully

developed and uploaded in the Play Store. This application was designed and developed by following through the ADDIE model phases, MIT App Inventor 2 is used to program and Adobe Illustrator for designing the interfaces. There are five modules within the app that are informasi (information), kesedaran (awareness), permainan (games), aktiviti (activity), and aduan (complaint).

Acknowledgement

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