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STUDYING THE USABILITY ON VARIOUS TYPES OF PROGRAMMING MOBILE APPLICATIONS

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Abstract: In this new era of technology, smartphone has been widely used. To cope with the vast usage of smartphone, many kinds of mobile application or mobile apps has been developed. Besides social mobile apps, educational mobile apps are also one of the most popular application among users. For those who learn programming, many programming mobile apps are available on iOS and Android platform. Thus, this paper will study on the usability on various types of programming mobile apps such as CaptainCStudy for iOS, C++ Programming for Android and Learn C++ for both iOS and Android. A survey has been done to find the usability of the apps based on the interface and layout, content and activity provided. Result shows that each of the apps has its own style of delivering the information. Besides being able to type programming syntax, the programming mobile apps also provide various information for the knowledge of the students and even exercises which can help students understand programming easily.

Keywords: interface, comparison, programming, mobile apps

INTRODUCTION

Nowadays, mobile devices have become one of the most popular communication devices among people of different ages. Student especially uses social networking media as a mean of communicating among themselves. The usage of mobile devices are becoming more popular for most computing tasks. Today, mobile devices are widely used not only for communication but also in education, entertainment, research collaboration and social interaction. (Ramanuja, 2014). In education, besides face-to-face, learning can also be done online. Instead of using using personal computers or tablet, it will be more convenient for the students to learn using mobile

devices.

Basically, learning programming are done in class using personal computers and giving hands- on to students. Mobile devices such as smartphone are the most commonly used technologies for mobile learning (Naismith et al., 2004). Smartphones are also the most widely used devices among students in developing countries (Mbogo C., 2017). Thus, with the over-increasing used of smartphone, many programming mobile applications have been developed to help learners learn programming easily.

Learning programming acquire skills and knowledge. Programming on smartphones is much more easier as we carry it with us at all time. Working with mobile devices makes learning programming more interesting to students. Students can download and use the applications available anywhere at anytime (Jordine et al., 2014). Thus, by carrying their own mobile devices with them at all times, students will effectively carry around the entire computer programming learning and practicing environment. (Tillmann et al., 2012).

Presently, millions of apps are available for free or to be purchased in different platform to smartphone users. Each day, new applications are launched to the online stores (Chandi et al., 2017). There were around 5 million mobile apps available for iOS devices in Apple's AppStore and Android OS devices on Google Play (Wikipedia, 2019a & Wikipedia, 2019b). Education apps has led to tremendous interest among learners and educators. Many programming mobile applications can also be found in the iOS and Android platform. This apps provide various features which can help learners to learn programming wherever they go. Most of the programming apps available in iOS and Android allow users to generate code in certain language. Some of it provide programming contents such as learning materials and examples while others provide activities and games related to programming.

Hence, this paper will study some free programming apps which are available in iOS and Android platform. The apps are C++ Programming for Android, Learn C++ for Android and iOS and CaptainCStudy for iOS. The study will focus on understanding the usage of each apps by reviewing all the features provided in the apps such as on the user interface, content and activities.

Figure 1 below shows the icon for the programming mobile apps that has been chosen.



Fig. 1 List of programming mobile apps

DATA COLLECTION

In this study, the primary data is collected through online questionnaires. The scope of respondent covers degree and diploma of civil and mechanical engineering students with different genders. The questionnaires are distributed in middle of the semesters.

A survey is done to study between three types of programming mobile application available in iOS and Android. The applications chosen are C++ Programming for Android, Learn C++ for Android and iOS and CaptainCStudy for iOS. C++ Programming can be installed for free using Google Play. It is being developed by Akshay Bhange and consists of tutorial sections and colourful programs. Learn C++ is a free programming apps developed by SoloLearn. It includes lessons which are split into 8 levels (SoloLearn, 2019). CaptainCStudy consists of 4 educational interactive contents (Softheaven, 2019). It is a free programming apps developed by Softheaven.

The content of the questionnaire is split into four components, which are; 1) personal background; 2) interface and layout; 3) content; and lastly 4) activities.

DATA ANALYSIS

The three programming mobile applications are being studied based on the interface and layout, content provided and activities given in the applications. For interface and layout questions, respondents need to answer according to the scale provided which is 1(Disagree), 2(Moderate) and 3(Agree).

Four questions has been constructed for interface and layout as given below:

- Q1: Is the application attractive?
- Q2: Is the application easy to use?
- Q3: Is the application interactive?
- Q4: Is the application interface consistence?

In the second part, four questions covers about the content.

- Q5: How far do you understand the content?
- Q6: How do you prefer the content to be displayed?
- Q7: What style do you prefer for the content?
- Q8: What type of content on programming do you prefer?

Finally, the last 4 questions enquired the respondents to answer questions based on the activities.

- Q9: What type of activities do you prefer?
- Q10: What type of questions do you prefer?
- Q11 Do you prefer to do the activity individually or in group?
- Q12: Is the activity in this application interesting?

RESULTS AND DISCUSSIONS

80 respondents have answered the survey in google form. The survey has been distributed to UiTM Cawangan Pulau Pinang diploma and degree engineering students from the Faculty of Civil Engineering and Mechanical Engineering. Figure 2 shows the number of respondents based on gender. Among all this students, 75% are male respondents while 25% are female respondents. This is because most of the engineering students in UiTM are male students.

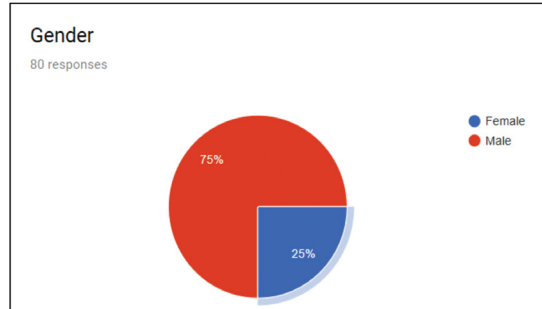


Fig. 2 Respondents based on Gender

Since this paper is to study the usability of programming mobile applications, it is very important for us to know how many students uses smartphone. The result below shows that all of the students have their own smartphone with data plan subscription. This enable the students to use the programming mobile apps easily.

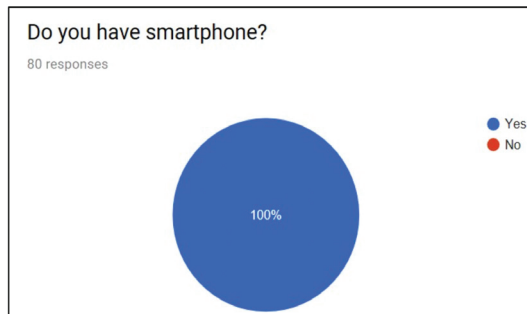


Fig. 3 Usage of smartphone and data plan

The below chart shows the result based on the problem faced when using the applications. Most of the respondents do not have any problem while using the applications whereas only 7% of them faces problems. This may be because of problems with the network connection, phone memory and new to the applications.

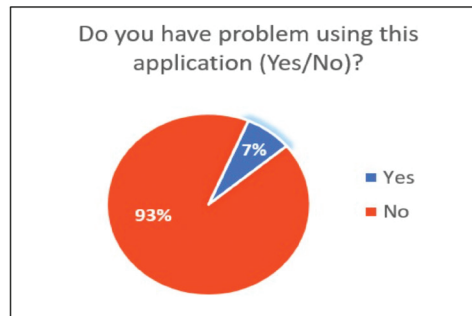


Fig. 4 Problem using the applications

This study focused on the applications based on the interface/layout, content and activities. Figure 5 shows the respondent's feedback on the applications interface/layout based on the attractiveness, easy to use, interactive and consistency of the applications. It shows that most of the respondents agree that the applications are attractive, easy to use and interactive while most respondents feel moderate on the consistency of the applications. This is because the applications interface/layout are being developed by different people and they have their own way of representing their applications.

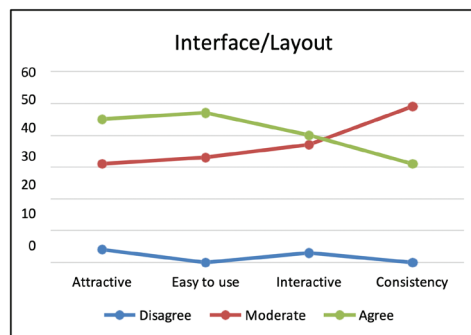


Fig. 5 Respondents' feedback on the applications interface/layout

The result below shows the respondent’s feedback on the applications content based on their understanding, content display, style and type. Most of the respondents think that the applications content are interesting. They prefer the content to be displayed by topics and can provide many programming examples instead of theory. The respondents also prefer the content to have the combinations of all elements which are text, graphics, videos and animated.

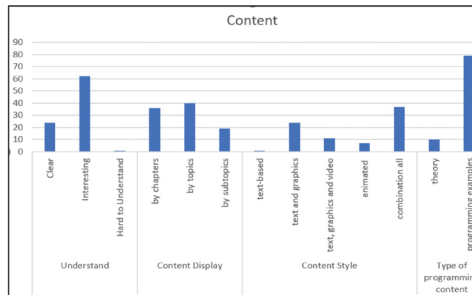


Fig. 6 Respondents’ feedback on the applications content based on their understanding and preferenc on the content display, style and type

Figure 7 shows the number of respondents’ feedback on the application activities. Most of the respondents feel that the activities are interesting while only 1 of them feel it is not interesting. This is because maybe the respondents do not understand the activities given. The respondents prefer the activities to be done in gaming form compared to the conventional way. This may led to the respondents preference on the group activity types instead of doing it individually. They also felt that activities on implementation is more better compared to theoretical types of questions.

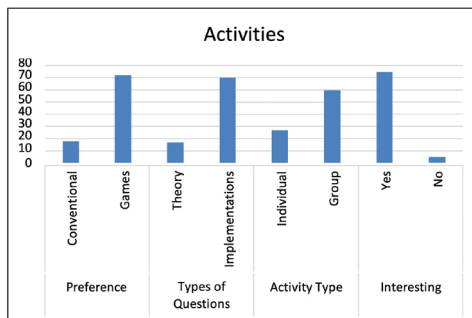


Fig. 7 Respondents’ feedback on the applications activities based on their interest and preference, types of questions and activity type

CONCLUSION

Mobile devices has been extremely used in many areas such as communication, entertainment, business and education. Many types of mobile application on education are available and can be downloaded free from the iOS and Android platform. Learning programming using smartphones are a new way of learning styles which can be done anywhere. With the increasing number of programming mobile applications available, student can learn programming easier. Most of the programming applications available can attract and help students to learn programming anywhere at any time. However, the programming applications may not satisfy certain students as the features may varies according to the students preference and requirements.

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