

F-C Tutorial App: Active Learning Approach via Mobile Application Technology to Develop Student Intrapersonal Skills

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Article Information

Received: December 12, 2020
Accepted: December 31, 2020
Online: March 01, 2021

Keywords

active learning, mobile application, intrapersonal skills

ABSTRACT

Mobile application technology has been widely used in various fields, including education, because it is software in mobile phones owned by anyone. Besides, it easy to use anywhere and anytime. Therefore, by applying the app's merits, the Fast and Correct Tutorial App (F-C Tutorial App) is developed using this technology as a platform. The F-C Tutorial App is a weekly tutorial whereby every weekend of the lecture weeks, students can download a few questions via the app, and then the answers that had been calculated need to be filled up in the app. A survey was conducted on the target group, and the survey questions were divided into three sections: the respondent background, the agreement of F-C Tutorial App can enhance student intrapersonal skills, and the F-C Tutorial agreement App is a user-friendly tool. The group of lecturers who develop this app believes that ongoing training that can easily access and accompanied by competition for rewards is an active learning approach that can motivate students to develop their cognitive and affective skills. Besides, the rules that need to be followed to ensure the F-C Tutorial App can be easier to use and positively impact.

INTRODUCTION

The use of technology in the present is undeniable by increasing the app's increasing use in most activities, including teaching and learning activities. In an atmosphere of direction towards the education revolution 5.0 (ER 5.0), tutors and students should be exposed to technology use skills. Current students are strongly emphasized in developing some of the skills required by industry players in the future. The use of technology in education can improve 21st-century students who have been exposed to digital environments and have complete access to technology wherever they are. As a result, multimedia technology is rapidly developing with various online applications in the market, which create great programs and attraction to the students, indirectly encourage them to be more effective in class ([Ahmad Zaki Bin Amiruddin et al., 2014](#)). A growing application based on smartphones has enabled

students to freely choose various Android applications in their research process. Mobile learning has opened up a new perspective for lecturers and students of the next generation, as it increased student interest and motivation that helped to determine the development of students. The widespread use of smartphones has led to a change in an educational system based on the technology known as mobile learning, which has set as an opportunity to use mobile technology to ease learning and access, regardless of time and place ([S. Mishra, 2007](#)). Mobile technologies, such as mobile phones, the iPad, laptops, and more, can make it easier for teachers and students to communicate and interconnect with more practical and dedicated learning activities.

Using Android applications can also provide excellent students, as most students show great interest in using mobile phones for learning purposes because it is a more advanced concept and easy to be used for the new generation ([Nur Sofurah et al., 2006](#)). The existence of a smartphone-based Android application has opened the opportunity for students to choose a variety of android apps for free in their study method ([Analisa Hamdan et al., 2013](#)). This interactive and distance education allows lecturers to explore and innovate different learning activities besides conventional classroom lessons.

Improving students' ability to understand subjects is challenging for teachers to produce individuals who can apply their knowledge. Therefore, pedagogues need to know teaching methods to ensure that they achieve goals. Ongoing training is a learning method that emphasizes activities of repeating the fact or theory after the lectures, which involve delivering knowledge to the students have been done ([Azizi Yahaya et al., 2010](#)).

This method can encourage educators to monitor student skills and knowledge to ensure acquired skills and knowledge. In addition to teaching methods, student learning styles also contribute to improving excellence in learning. Highly motivated students can be stimulated to learn as they continuously increase their determination and passion for achieving the best results among the best ([Nur Sofurah et al., 2006](#)). Therefore, teachers are the closest individuals to students who can increase student motivation in education.

When a specific task is completed, the student's reward or recognition can increase students' spirit to be more excellent and productive. Training can be offered at any time without waiting for lectures or tutorials for using digital technology. E-tutorials are known as all kinds of activities that support students using the internet or online. The educator needs to have additional skills that involve online learning to attract more students to participate in this activity. Moreover, tutoring experiences are significant factors in increasing students' involvement and improving the relationship between tutors and students during the learning process ([Kopp et al., 2014](#)).

Modus Operandi

As the first step, at the beginning of the semester, students need to download the F-C Tutorial app from the student WhatsApp group sent by the lecturer. On the last day of the week, students can download weekly questions through the app. The answers for each question need to be filled out in the specified space. If the answer is correct, the student will receive the key to success. Later, this key to success needs to be sent to the lecturer as soon as possible. The first student who sends the key to success will receive a reward. The rewards are answers scheme, and the student details such as their name and photo will be displayed at the faculty hall of fame. At the end of the semester, the students who receive the most key to success will be given another faculty reward. Figure 3 shows a diagram of the F-C Tutorial app, modus operandi.

Guideline

Following guidelines need to be followed to ensure the modus operandi of this active learning method is effective and contributes a positive impact to the students:

1. The question should involve the calculation only, follow the chapter in the lesson plan, have different difficulty levels, and are not similar to any source question.
 - Make this tutorial challenging and competitive as to be an attraction factor for students to participate.
2. For the answer, it should be specified parameters to be solved, decimal and units
 - Avoid students from wasting their time looking for new answers even though the answers are correct, consequences of different decimal and units, the filled answer is wrong.

3. For the lecturer, they should and focus on their handphone during the tutorial period.
 - The first student who successfully answers the question can be known and be announced as soon as possible.
4. For the winner announcement, it should be announced as soon as possible.
 - The students can focus on other questions that have not yet been successfully answered.

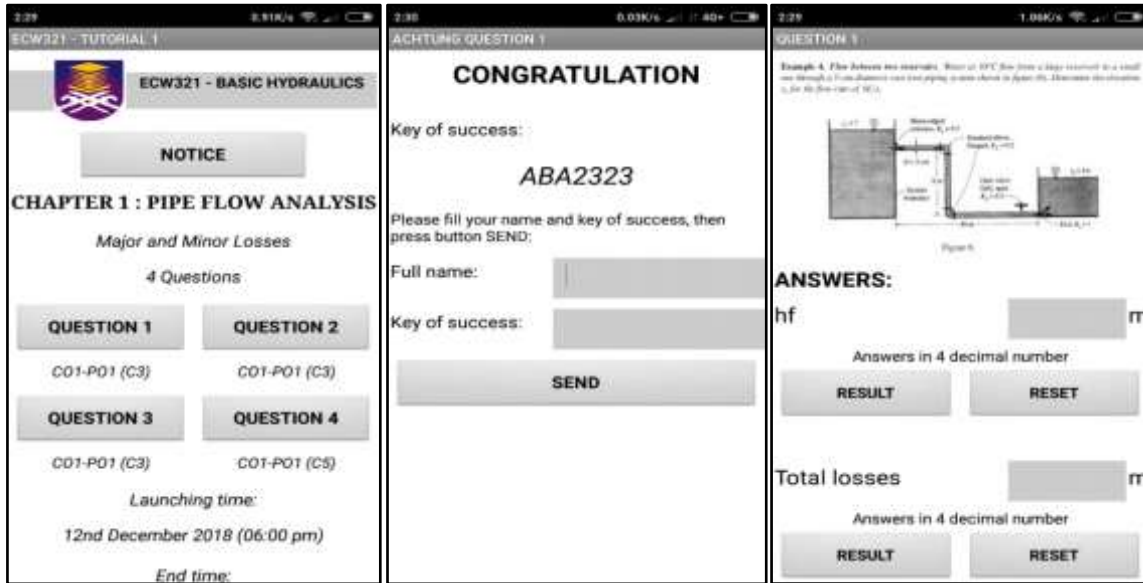


Figure 1. Samples of F-C Tutorial app interface

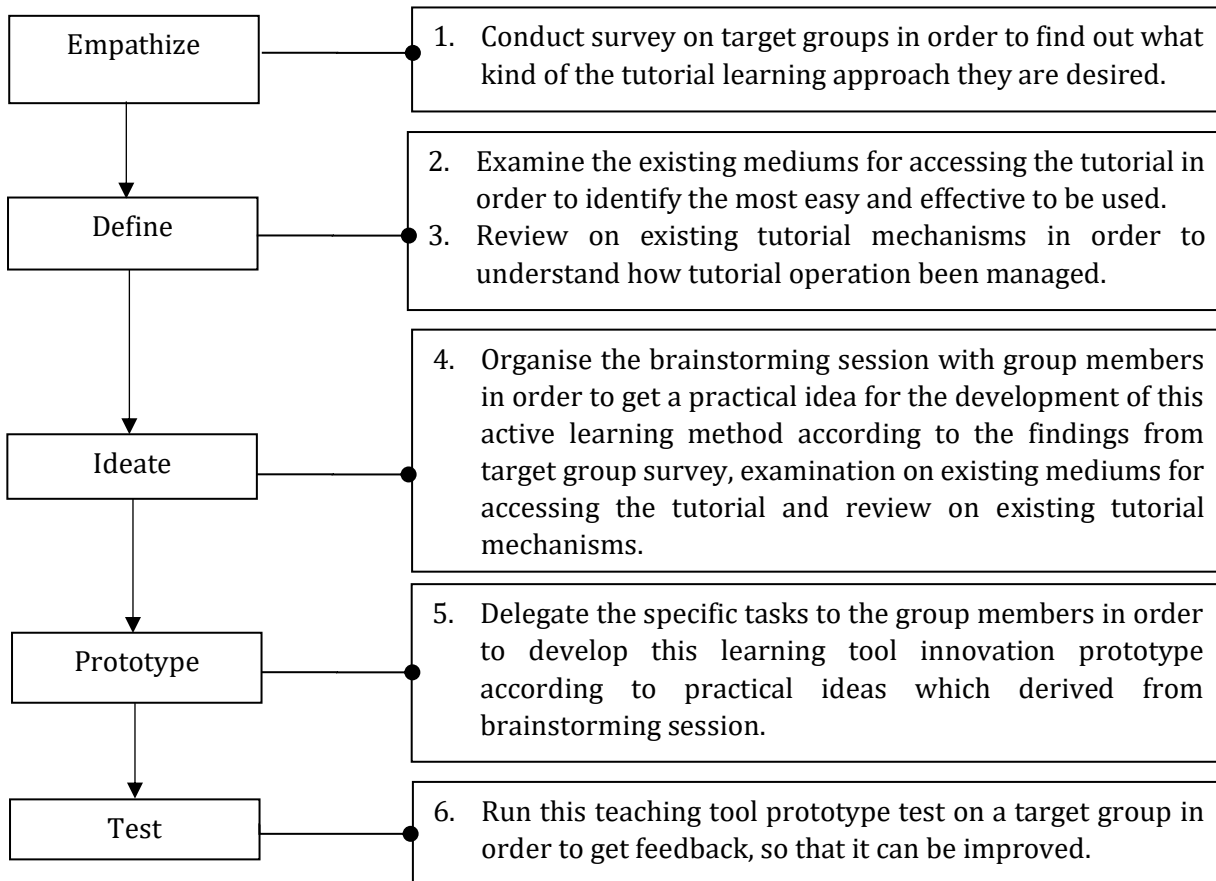


Figure 2. Development of F-C Tutorial app which adapted design thinking concept

METHODS

A survey was conducted on the target group, who is enrolling Basic Hydraulics (ECW321) course. All respondents were from the Faculty of Civil Engineering, Universiti Teknologi MARA Pahang. The survey questions were divided into three sections: the respondent background, the F-C Tutorial App agreement can enhance student intrapersonal skills, and the agreement of the F-C Tutorial App is a user-friendly tool. The designed questionnaires on the app's agreement were evaluated based on 5-point Likert Scale, which indicates scale 1 for strongly disagree and scale 5 for strongly agree (Table 1). The survey was designed by referred and modified from some existing surveys that have been used in research related to people's perception of education tools. The analysis of the responses was done using the Statistical Package for Social Science (SPSS).

Table 1. Level of Agreement

Level of agreement	Score
Strongly disagree	1.0 – 1.99
Disagree	2.0 – 2.99
Not sure	3.0 – 3.99
Agree	4.0 – 4.99
Strongly agree	5.0

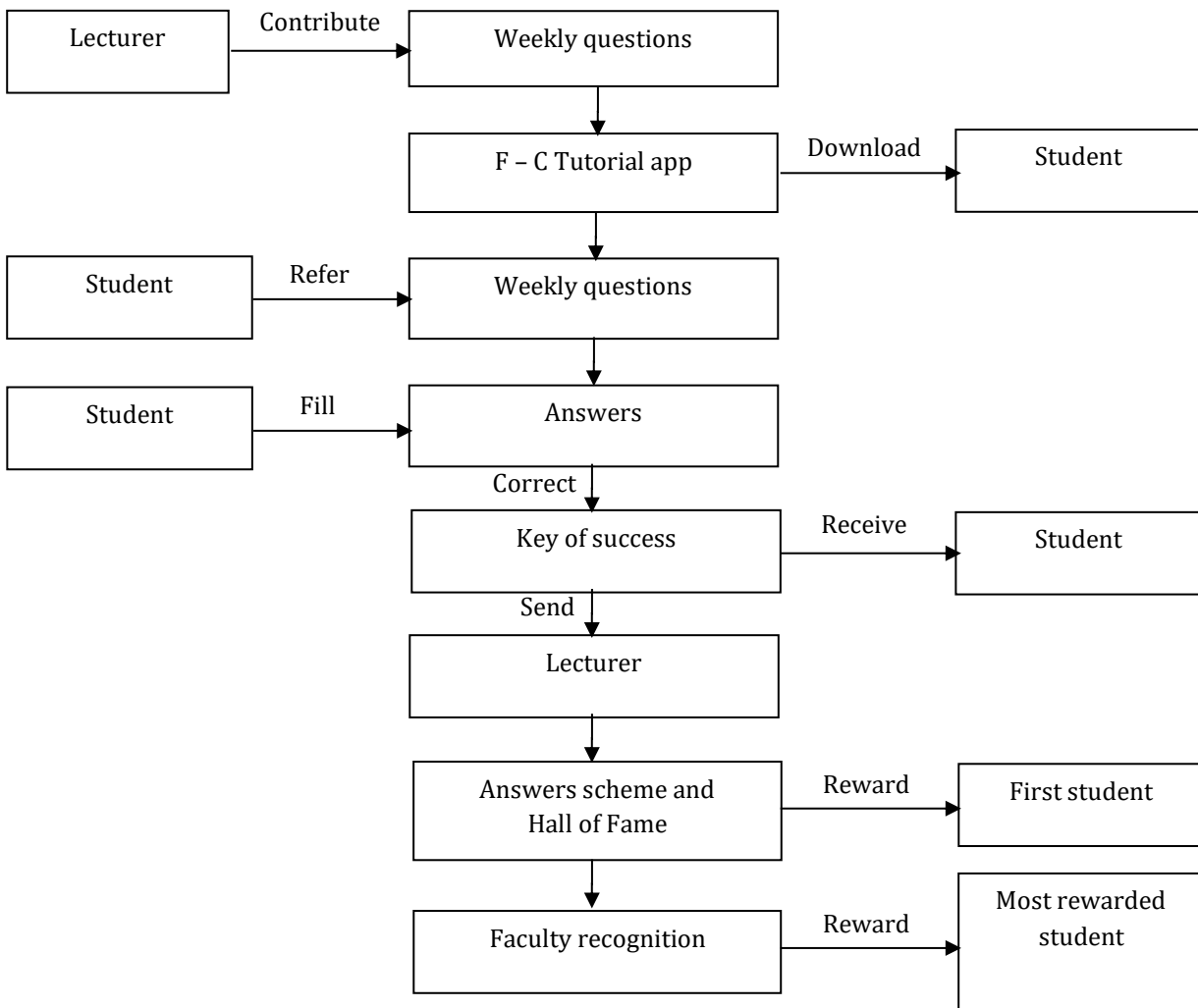


Figure 3. Modus operandi of F-C Tutorial app

The respondent background, which was divided into lecturers, and students are shown in Table 2. It is shown that the student and lecturer respondents are divided into gender, age, academic qualification, and information technology knowledge. This detailed background of respondents summarizes that the survey findings are relevant to represent a whole related community's perception towards this teaching tool.

Table 2. Summary of the Respondent Background

Respondent background		Student		Lecturer	
		Number	(%)	Number	(%)
Gender	Male	10	50	4	40
	Female	10	50	6	60
Age	19 – 25	20	100		
	26 – 30			2	20
	31 – 35			3	20
	36 – 40			5	50
Academic Qualification	Diploma	20	100		
	Master			7	70
	PhD			3	30
Information Technology Knowledge	Yes	20	100	10	100
	No				

RESULTS

The questions and the mean score of the survey responses towards the F-C Tutorial App's agreement can enhance student intrapersonal skills are shown in Table 3. It shows that both respondent categories agreed well that the app could enhance student cognitive and affective skills.

It is also indicated that the app gives both parties more benefit in the teaching and learning process since they can also measure their understanding of the course's particular topic.

Table 3. Mean Score on F-C Tutorial App can Enhance Student Intrapersonal Skills

Survey	Student		Lecturer	
	Mean score	Level of agreement	Mean score	Level of agreement
I felt this app is a helpful and useful tool in the learning process	4.60	Agree	4.80	Agree
I found that the level of difficulties of the questions in this app are consistent with Outcome-Based Education (OBE) requirements	4.10	Agree	4.60	Agree
I found that this app can help students in revising.	4.20	Agree	4.40	Agree
I felt this app could enhance student's cognitive skills.	4.60	Agree	4.70	Agree

Survey	Student		Lecturer	
	Mean score	Level of agreement	Mean score	Level of agreement
I felt this app could enhance student's affective skills.	4.50	Agree	4.70	Agree
Average	4.40	Agree	4.64	Agree

Meanwhile, Table 4 shows that most of the respondents agreed that an app is a user-friendly tool. They agreed because, in the first place, the app is not complicated and easy to use due to the various functions in the app were well integrated. Besides, app graphic user interfaces' attractive designation is one of the key components to attracting users to use the app.

Table 4. Mean Score on F-C Tutorial App is a User-Friendly Tool

Survey	Student		Lecturer	
	Mean score	Level of agreement	Mean score	Level of agreement
I think the design of this app is attractive.	4.80	Agree	4.70	Agree
I felt very confident using this app.	4.90	Agree	4.60	Agree
I found the various functions in the F-C Tutorial app were well-integrated	4.70	Agree	4.50	Agree
I thought this app was easy to use	4.80	Agree	4.50	Agree
I found this app unnecessarily complicated	4.70	Agree	4.40	Agree
Average	4.78	Agree	4.54	Agree

Cognitive skills can be enhanced through this active learning as students can try a new question every week, whereby these questions are in line with what they learned during the entire week. Enhancing practical skills is through the idea of the strategies plan to be the first student that correctly answers a question.

However, what is most important are the other benefits that the students can gain. For example, the students can know who a student is proficient in any particular chapter; thus, they can make their source of reference. It also indirectly can motivate students to have a spirit to compete persistently, whereby this kind of spirit will drive them to be a person who is hardworking and hard to give up. A positive attitude will assist them to be successful professional workers in the future.

DISCUSSION

This section discusses how this mobile application is developed in detail and how lecturers and students can use it. Besides, the guidelines need to be followed in using this app. Figure 1 shows a sample of the F-C Tutorial app interface. The development of this teaching tool innovation adapts a design thinking approach. The purpose is to ensure the tool meets the needs of users and competitive. The teaching and learning process, which relies on collaborative computer technology, is seen as a wicked problem ([Kopp et al., 2014](#)). A wicked problem is a term used to describe a difficult problem because they are incomplete, requirements are constantly changing, and various interests are related. One effective way to overcome this wicked problem is by implementing a design thinking approach ([Buchanan, 1992](#)).

The development starts by surveying the target group. The survey aimed to identify the tutorial learning method's criteria that should be developed according to the target group's perspective. A total of 10 lecturers and 20 students were involved in the survey. Through the findings of the survey, it is concluded that the necessary development of this teaching tool that could enhance the student cognitive and affective skills is by developing a tutorial learning method according to the following criteria:

1. Easily accessible to students
2. In line with the student level of thinking
3. Can attract students to participate
4. User friendly

Design thinking process education, especially teaching design thinking, can develop a creative competence mindset that could lead a person to be confident in their creativity ([Buchanan, 1992](#)). This own ability benefits the students. [P. Mishra et al., \(2003\)](#) suggested that the best way to learn design thinking, probably creative problem-solving skills are not only learned through demonstration and observation but also needs an active process of creating and doing. [Lawson \(2005\)](#) confirms that the only way to develop this kind of skill.

Information of existing mediums for tutorial access such as online, website, social media, and mobile application are collected, and then its advantages and disadvantages are analyzed to meet the first criteria. The findings show that this tutorial learning method is appropriate using the mobile application platform. It is based on the mobile application is the current trend in accessing information by people. Also, mobile phones are owned by every student, and internet coverage can be reached in the whole area of UiTM Pahang. App Inventor 2 is used to develop this app and is supported by Google Sites as part of the interface. App Inventor 2 is a mobile application development software, while Google Sites is software for website development. Both software is open-access software.

Weekly questions are prepared by a lecturer that teaches the course and monitored by the lecture in charge (LIC). It is to meet the second criteria. The main attraction for students to participate in this tutorial is by introducing challenges and rewards. [Khan \(2017\)](#) believed that challenges and rewards are a great strategy in creating a high degree of commitment, involvement, and cooperation among communities in an organization. However, it has to ensure the communities are rewarded accordingly and aligned with the policies and practices.

The challenge is the competition amongst students to be the first student who can answer correctly—besides, the period for answering a question. If the question is not answered within the period, then the question will be deleted in the app. The rewards will only be given to the first student who successfully answered the question for the rewards. The first student also can get faculty recognition if the student is the most rewarded student throughout the semester. Two different approaches are adopted to ensure this application is user-friendly.

The first approach is to review existing tutorial apps, and the second approach is to run a prototype test on the target group. The purpose of the review is to know the attractive design of the app and its effective operation. Meanwhile, the test run is to get feedback for improving and enhancing the app. Figure 2 shows a diagram of the F-C Tutorial app development, which adapted the design thinking concept.

CONCLUSION

The F-C Tutorial App is developed as an initiative to assist lecturers in the teaching and learning process. This app's active learning tutorial is parallel to the government mission towards educational revolution 5.0 (ER 5.0) and industrial revolution 4.0 (IR 4.0). Adaption of design thinking in the app's development is the right way to exemplary successful implementation as a teaching tool. Nevertheless, implementing this active learning can only succeed if all the related parties play their role to follow the guidelines.

For recommendation in future studies, the app needs to be improved on the flexibility of the features in this app that suitable for other courses and market purposes. This app can be used in Malaysia and other countries and at a higher level of the institution and can also be implemented in lower institutions such as school studies. Therefore it is hoped that this app's development may produce a high quality of graduates from respective institutions.

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