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Innovation in Teaching and Learning Management (ITLM) for Diploma in Manufacturing Engineering, Politeknik Ibrahim Sultan

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Abstract

The education management system in Malaysia is now moving towards being more advanced in line with the needs and requirements of the latest technology. Generally, the use of paper is very important in management. However, the abundant usage of papers is not in line with the requirements of the Green Technology element. In this regard, this innovation is implemented to meet the challenges of green technology that has been absorbed at every level of the education sector. The scope of this innovation is applied in the distribution of documentation related to teaching and learning management such as student handbooks, academic calendars, learning schedules, any notifications and official memos in a new way using the 'cloud drive' development model. This innovation will replace the old system such as student handbooks that were distributed during the registration of new students each semester. Next by simply linking the 'cloud drive' development model with the use of QR codes, the student handbook can be referred by students online. Therefore, the cost of printing a thick student handbook can be reduced by just using a piece of business card along with a QR code. The development of this 'cloud drive' model can provide various forms of guidance needed by new students as well as senior students at Ibrahim Sultan Polytechnic. This QR code system also makes it easy for all students and lecturers to get all the information at their fingertips using a smartphone. All information available in the development of this 'cloud drive' model can be changed according to needs and requirements without the need to reprint if there is any amendment. In addition, ITLM is also easy to carry anywhere with student cards. The survey that was given to 40 people consisting of students and lecturers showed that the 'cloud drive' system connected via QR code is very useful and facilitates them in accessing information and management work. In summary, ITLM can eliminate paper usage and costs can be reduced because it can be updated at any time and avoid wasting costs that have to be borne by the administration.

1. Introduction

The rapid development of information technology and moving in line with the development of telecommunication technology has strengthened every area of human life and activity. By organizing the database well, information and communication technology offers the opportunity to achieve quality in making a management decision optimally (Aferdita-Berisha-Shaqiri, 2014). In addition, information and communication technology also has been evident for sustainability which has a very important impact toward Green Technology. Green Technology refers to the development and application of products, equipment and systems to preserve the environment and nature and minimize or reduce the negative effects of human activities. Information technology reduce energy consumption and conserve natural resources efficiently with use of hardware and software (Alok Msihra et. Al, 2012). For example, trees that play an important role in ecosystems are being cut down for the use in construction and management. This includes educational management where paper is widely used in official affairs. Therefore, by using the latest technology for delivery method can save on the use of paper which can also contribute towards green technology.

In conjunction with this purpose, this innovation was developed and introduced in the management of education system to meet the challenges in rapid information delivery and also apply green technology in eliminate the usage of paper in daily life.

1.2 Background problem

In Malaysia, the usage of paper is very high. According to a report by Thanam Industry Sdn Bhd, there were over 57,000 tonnes of paper every month which can fill up a landfill space with 456,000 cubic metre. The amount of scrap is the same as cutting down 680,000 trees every month (Anonymous, 2020). The education system is also one of the contributors to the high waste of paper. Since students and academicians have the opportunity to quickly and economically uses various applications domains and resources through a network (Amol Kale, Rajivkumar Mente (2017), this project was developed to reduce paper usage by applying information technology and telecommunication technological equipment. In this project, the technology that in question is 'cloud drive' system which can be creatively and innovatively applied to save costs, speed up the process or improve the quality of official affairs. Therefore, this project was meant to ease students and academicians under Diploma in Manufacturing Engineering of Politeknik Ibrahim Sultan to access and gain any related information in education affairs from a 'cloud drive' system just by using a QR code name card application.

1.3 Problem Statement

Each polytechnic student who registers will be given a copy of the guidebook as thick as 80 pages and others document such as student handbooks, academic calendars, timetable and etc. Therefore, preliminary printing must be done so that the registration process is not interrupted, apart from involving high costs for the printing process, all information in the handbook cannot be changed. Reprinting must be made if each time a change occurs and this process involves cost and waste as the handbook already printed which is cannot be distributed to new students. Therefore, QR code name card was applied in this project to replace the system. The QR code becomes the link to the 'cloud drive' system that contains all the information mentioned. Students and also academicians can access all the information just by scanning the QR code using telecommunication device.

1.4 Objectives:

The main objective of this innovation project is to create a 'cloud drive' system which contains information for education management that can be access using QR code link. Besides, this innovation project was developed with given significantly purposes:

- 1.4.1 Apply the Green Technology which will eliminate the usage of paper.
- 1.4.2 Create a cheerful, creative, technological environment and save costs.
- 1.4.3 Polishing the creativity and innovation of lecturers in solving problems.

2.0 Methodology

In initially design phase, a mind mapping concept was applied to briefly describe the concept (Figure 1) of this project and list out all information categories related to management in education of polytechnics (Figure 2). The objective was to ensure that the 'cloud drive' system that will be developed does not run away from its purpose and convey the right information.



Figure 1: Brief concept of ITLM 'cloud drive' system

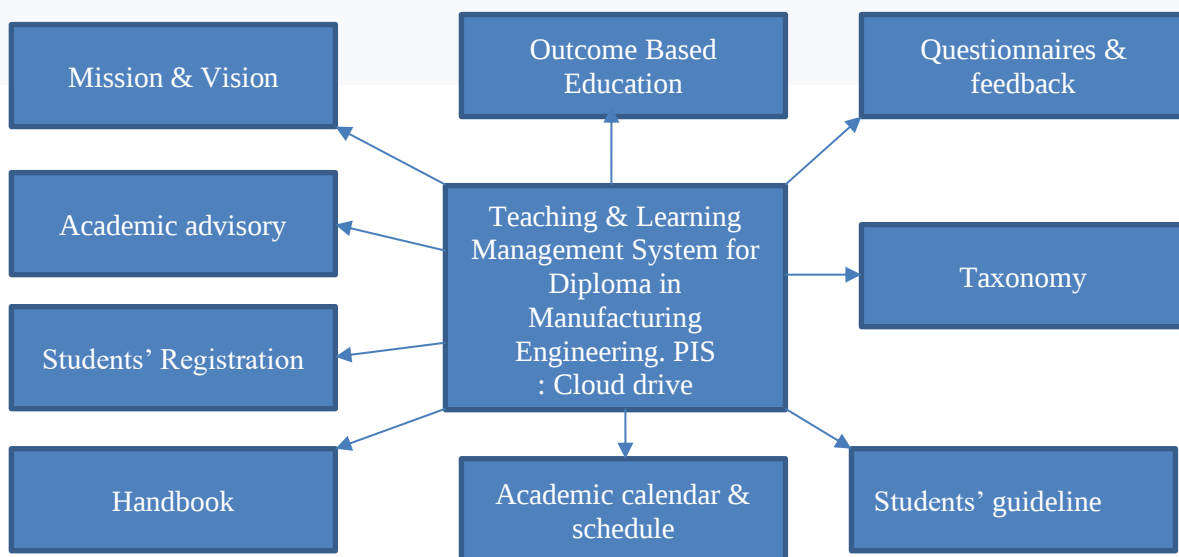
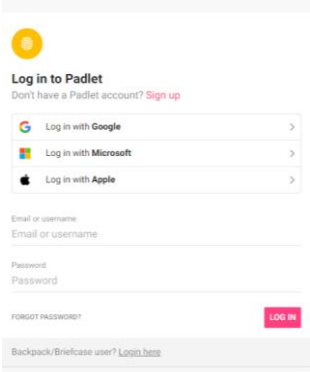
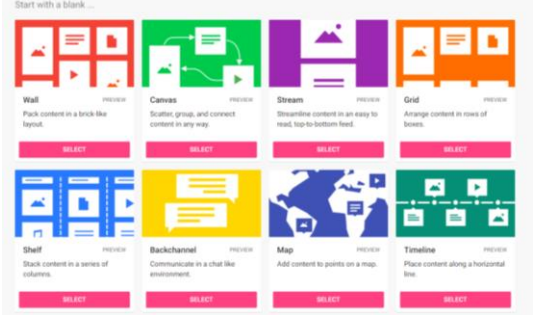
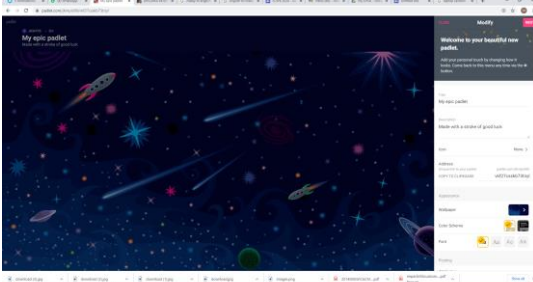
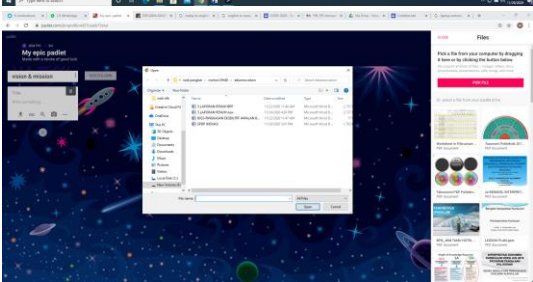
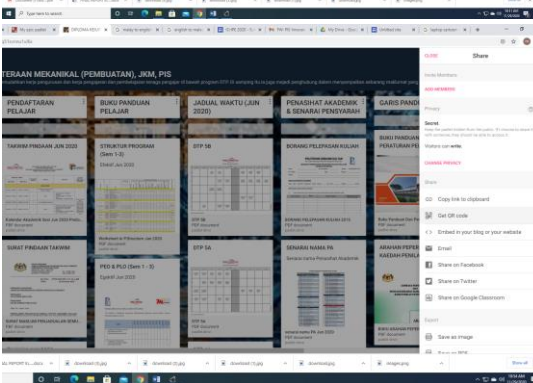


Figure 2: Mind mapping of information in 'cloud drive' system

Next is the development phase where a platform of 'cloud drive' system was developed using 'padlet.com/dashboard'. It is an open sources website which allow user to create their own 'cloud drive' system without using any programming language. After obtaining all required information and documentations, a 'cloud drive' platform was build using 'padlet.com/dashboard'. Brief steps are as follow in Table 1:

Table 1: Steps in creating the ITLM ‘cloud drive’ platform

No	Steps	Image
1.	Signing into ‘padlet.com/dashboard’	
2.	Select a template design	
3.	Modify template look according to your preference	
4.	Create categories and start uploading and posting information, documents, survey, link and etc.	
5.	Once complete, copy platform link and get QR code	

6. Insert the platform link and QR code in the business card that will be distributed among students and academicians



There are other reliable open sources website that offers the same function such as ‘sites.google.com’ and ‘weebly.com’. Each site offers different feature

The end product of this innovation project was business card (Figure 3). The cards then were distributed to the students and other staffs of Diploma in Manufacturing Engineering, Politeknik Ibrahim Sultan as reference. Starting at this point, they can easily access and gain required information from the ‘cloud drive’ platform (Figure 5) by just scanning the QR code on the business card using their android phone (Figure 4) and tablets, or access it through given link by using their laptop or desktop. The platform of ITLM ‘cloud drive’ platform allow users to view any information their desire or even download it if they want to.



Figure 3: Showing the front and back of ITLM business cards.



Figure 4: An android phone scanning QR code using appropriate application

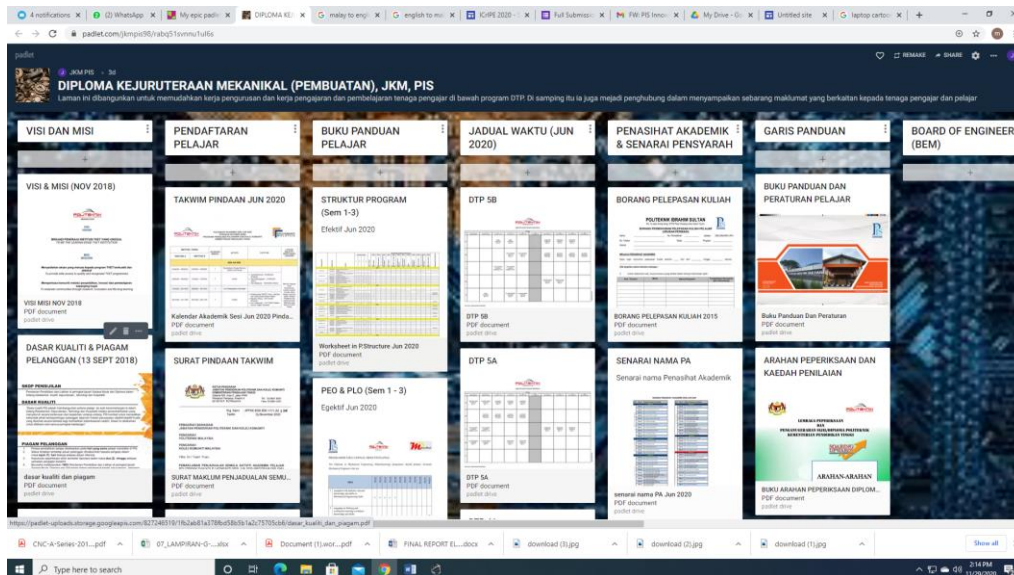


Figure 5: Interface of ITLM 'cloud drive' platform

The last phase of this project was conducted a survey through questionnaire to study the effectiveness development of this 'cloud drive' system whether it is relevant to use and facilitate according to user's perspective. At early stage, this project aimed to involve 40 respondents among students and staffs under the Diploma of Manufacturing Engineering. However, 49 respondents have given response. The purpose is to take into account views of staff under other programs if the same system is applied to them. Respondents were given the link to surf the ITLM 'cloud drive' system before they were asked to give response to the questionnaire. The questionnaire takes 5 level of Liker Scale in determining whether the system developed meets the needs and facilitate the user, namely (Saul McLeod, 2019):

- i. 1 = strongly not agree
- ii. 2 = not agree
- iii. 3 = undecided
- iv. 4 = agree
- v. 5 = strongly agree

4.0 Result and Analysis

This survey was conducted to evaluate the effectiveness of this system in information delivery & documentation access. This study was conducted on two (2) categories of respondents namely students and lecturers. There were 22 lecturers and 27 students have given response and 33 of them were male and others were female. Likert scale was used in determining the respondents' judgment of effectiveness using 5 items stated before and the result as in Figure 6.

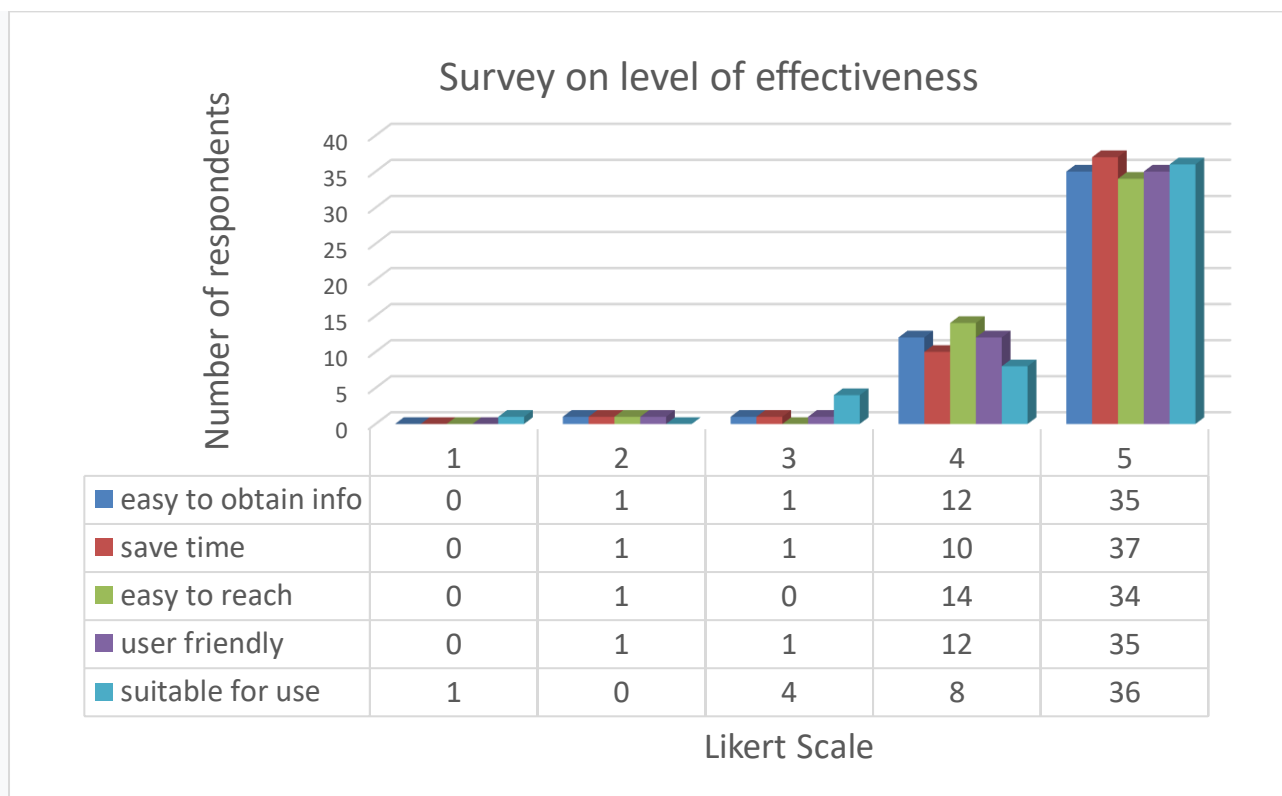


Figure 6: Histogram of survey on level of effectiveness

According to Kay Sing (2017), there are eleven (11) characteristics of a good website usability. Among of them are browser consistency, mobile compatibility, accessible to all users and effective navigation. Survey applied on this project has took these characteristics to construct items that have been asked except changing on the keyword so that respondents can directly understand such as follow:

- i. browser consistency = easy to obtain info
- ii. mobile compatibility = save time
- iii. accessible to all users = easy to reach
- iv. effective navigation = user friendly

However, the fifth item which is 'suitable for use' is a question to identify whether the users was satisfy with the ITLM 'cloud drive' system generally. Figure 6 shows that 96% of respondents agree that ITLM 'cloud drive' system was effective in term of easy to obtain information, save time and user friendly. Next is 98% respondent agree that the system was easy to reach. This may be due to the usage of QR code and link given in the name card which ease them to access the system. Score of 96% on item 'suitable for use' strengthen the assumption that this ITLM 'cloud drive' system is generally acceptable to use and satisfy the users need.

5.0 Conclusion

The result of this conducted analysis simplifies that ITLM 'cloud drive' system is useful and accepted by users. The lecturers and students achieve information easily, interestingly, interactively and cheaply. Thus, it also applies the Green Technology which eliminate the usage of paper and creatively and critically safe the environment and cost.

6.0 References

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